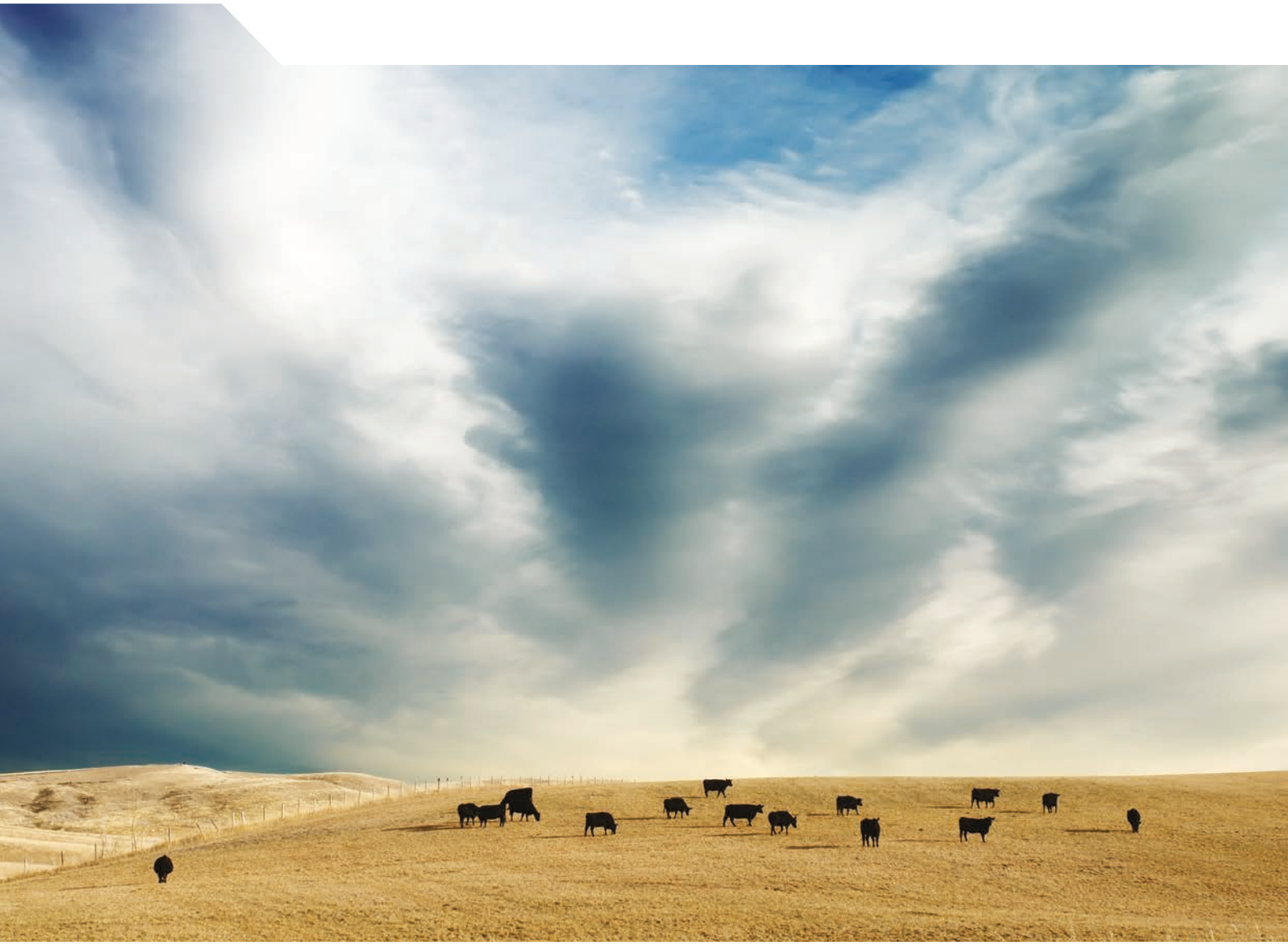
Agricultural Policy Monitoring and Evaluation 2022

REFORMING AGRICULTURAL POLICIES FOR CLIMATE CHANGE MITIGATION



OECD

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REFORMING AGRICULTURAL POLICIES FOR CLIMATE CHANGE MITIGATION

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Foreword

This *Agricultural Policy Monitoring and Evaluation 2022* report provides up-to-date monitoring and evaluation of agricultural policies across 54 countries from across the world, including the 38 OECD countries and the five non-OECD EU Member States, and eleven emerging and developing economies: Argentina, Brazil, People's Republic of China, India, Indonesia, Kazakhstan, the Philippines, the Russian Federation,[*] South Africa, Ukraine and Viet Nam. It is the 35th in the series of the OECD *Agricultural Policy Monitoring and Evaluation* reports, and the tenth report to include both OECD countries and emerging and developing economies.

The report provides insights into the increasingly complex nature of agricultural policy and is based on the OECD's comprehensive system for measuring and classifying support to agriculture — the Producer and Consumer Support Estimates (PSE and CSE) and related indicators. These indicators provide comparable information across countries on the nature and extent of support and serve as a basis for the OECD's Agricultural Policy Monitoring and Evaluation. This 2022 report focuses on the role of agriculture and of agricultural policies in combatting climate change.

The report is structured as follows. The Executive Summary synthesises the key findings. Chapter 1 discusses the importance of the agricultural sector in global greenhouse gas (GHG) emissions and its potential to contribute to overall mitigation efforts. In particular, it provides an overview of countries' strategies and policy actions for reducing agricultural GHG emissions and makes recommendations to address climate change mitigation objectives. Chapter 2 provides an overview of recent developments in agricultural policies and support, including in further policy responses to the COVID-19 pandemic and their implications for agricultural support. Chapter 3 describes the overall trends in agricultural support and is followed by individual chapters for each of the countries covered (the European Union, which has a Common Agricultural Policy, is presented as a single chapter). Country chapters begin with snapshots containing brief summaries of developments in agricultural policies and support as well as country-specific policy recommendations. This is followed by more comprehensive descriptions of agricultural policy developments, including related to efforts to reduce agricultural net GHG emissions. A Statistical Annex containing detailed background tables of the indicators of agricultural support is available as a separate document on the OECD website (https://doi.org/10.1787/7f4542bf-en).

The Executive Summary as well as Chapters 1 and 2 are published under the responsibility of the OECD Committee for Agriculture. The remainder of the report is published under the responsibility of the Secretary-General of the OECD.

[*] This report does not contain a country chapter on the Russian Federation, nor any tables with support indicators in the Statistical Annex. However, aggregate data for the 11 emerging economies and for all 54 countries covered in this report continue to include those for Russia.

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List of Acronyms and Abbreviations

AAFC	Agriculture and Agri-food Canada
AEIs	Agri-environmental Indicators
AFOLU	Agriculture, Forestry and Other Land Use
AIS	Agricultural Innovation System
APMC	Agricultural Produce Marketing Committee (India)
ASEAN	Association of Southeast Asian Nations
ASF	African Swine Fever
BECCS	Bioenergy with Carbon Capture and Storage
BNPT	Food assistance programme (Indonesia)
BRM programmes	Business Risk Management programmes (Canada)
BULOG	Food Logistics Agency (Indonesia)
CAP	Canadian Agricultural Partnership
CAP	Common Agricultural Policy (of the European Union)
CARES	Coronavirus Aid, Relief, and Economic Security (Act) (United States)
CEPA	Comprehensive Economic Partnership Agreement
CFAP	Coronavirus Food Assistance Program (United States)
CH_4	Methane
CMU	Cabinet of Ministers of Ukraine
CO_2	Carbon dioxide
COVID-19	Corona Virus Disease, first recorded in 2019
EAEU	Eurasian Economic Union (Kazakhstan)
EEA	European Economic Agreement
EFTA	European Free Trade Association
EMBRAPA	Brazilian Agricultural Research Corporation
ETS	Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GI	Geographical Indication
GRA	Global Research Alliance on Agricultural Greenhouse Gases (New Zealand)
GRF	Gross Farm Receipts
GWP	Global Warming Potential
IAM	Integrated Assessment Model
IHS	Import Health Standards (New Zealand)
INDAP	The smallholders' agency (Chile)
INTA	The Agricultural Technology Research and Transfer Institute (Costa Rica)
IPCC	Intergovernmental Panel on Climate Change
LCA	Life Cycle Assessment
LULUCF	Land Use, Land Use Change and Forestry

MAFF	Ministry of Agriculture, Forestry and Fisheries (Japan)
MAPA	Ministry of Agriculture, Livestock and Food Supply (Brazil)
MARA	Ministry of Agriculture and Rural Affairs (China)
MARD	Ministry of Agriculture and Rural Development (Israel)
MeaDRI	Measures for Achievement of Decarbonisation and Resilience with Innovation (Japan)
MRV	Measurement, Reporting and Verification
NAFTA	North American Free Trade Agreement
NDC	Nationally Determined Contribution
NFA	National Food Authority (the Philippines)
NS	Nitrogen Surplus
N_2O	Nitrous oxide
OECD	Organisation for Economic Co-operation and Development
PEM	Policy Evaluation Model
PROAGRO	General agriculture insurance programme (Brazil)
PROCAMPO	System of direct income support payments (Mexico)
RCEF	Rice Competitiveness Enhancement Fund (the Philippines)
RCEP	Regional Comprehensive Economic Partnership
R&D	Research and Development
RDP	Rural Development Programme
RTA	Regional Trade Agreement
SADER	Ministry for Agriculture and Rural Development (Mexico)
TFP	Total Factor Productivity
TRQ	Tariff Rate Quota
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USDA	United States Department of Agriculture
VAT	Value Added Tax
WHO	World Health Organization
WTO	World Trade Organization
OECD indicators of support	
ACT	All Commodity Transfers
CSE	Consumer Support Estimate
GCT	Group Commodity Transfers
GSSE	General Services Support Estimate
MPS	Market Price Support
NAC	Nominal Assistance Coefficient
NPC	Nominal Protection Coefficient
OTP	Other Transfers to Producers
PSE	Producer Support Estimate
SCT	Single Commodity Transfers
TBSE	Total Budgetary Support Estimate
TSE	Total Support Estimate
Currencies	
ARS	Argentinian peso
AUD	Australian dollar
BRL	Brazilian real
CAD	Canadian dollar
CLP	Chilean peso
COP	Colombian peso
CHF	Swiss frank
CNY	Chinese yuan renminbi
CRC	Costa Rican colon
EUR	Euro
GBP	British pound
IDR	Indonesian roupiah
INR	Indian rupee
ILS	Israeli shekel

ISK	Icelandic krona
JPY	Japanese yen
KRW	Korean won
KZT	Kazakh tenge
MXN	Mexican peso
NOK	Norwegian krone
NZD	New Zealand dollar
PHP	Philippines peso
RUR	Russian rouble
TRY	New Turkish lira
UAH	Ukrainian hryvnia
USD	United States dollar
VND	Vietnamese dong
ZAR	South African rand

Executive Summary

Short-term agricultural policy responses to global crises must simultaneously address current challenges and support reforms to combat climate change and distortions in international markets.

Continued rise in agricultural support slower than sector growth, but driven to record highs mainly by temporary factors

Total support towards the agricultural sector reached USD 817 billion per year over 2019-21 for the 54 countries covered by this report, a 13% increase over the USD 720 billion reported for 2018-20. Of this total, USD 500 billion per year was paid from public budgets, with the rest being transferred through higher prices. This increase is partly driven by factors that may prove to be temporary, including support to both consumers and producers in the context of the COVID-19 pandemic and increases in market price support related to rebuilding herds following African Swine Fever.

At USD 817 billion per year in 2019-21, total support has increased 2.4-fold from 2000-02 in nominal terms, which compares to a 3.3-fold growth in the value of agricultural production. This total is concentrated in a few large economies. Among OECD countries, support has remained substantial, averaging USD 346 billion per year over 2019-21. The European Union and the United States, both large agricultural producers, jointly account for two thirds of this total. Agricultural policy reforms in OECD countries have stalled in the past decade, and in some cases, have even been rolled back. At the same time, support in the 11 emerging economies covered in this report has increased significantly, reaching USD 464 billion per year in 2019-21, with the People's Republic of China (hereafter "China") alone accounting for about 60% of this total.

Individual producers received USD 611 billion per year in positive support in 2019-21, representing 17% of gross farm receipts in OECD countries and 13% in the 11 emerging economies. Of this support to producers, more than half, or USD 317 billion per year, took the form of support through higher market prices paid by consumers, while the remaining USD 293 billion was paid by taxpayers through budgetary transfers.

In a small number of countries, policies also suppress prices for some or all commodities, generating a transfer of USD 117 billion *away from* agricultural producers. As a consequence, **net** support to producers (the Producer Support Estimate, or PSE) averaged USD 494 billion per year in 2019-21, or 12% of gross farm receipts across the 54 countries covered in the report.

The share of general services to the sector (including innovation and infrastructure) has decreased to 13%

In contrast, general services for the sector (GSSE) again represented a relatively small share of support, at little more than one in eight dollars of the total transferred to the sector (or USD 106 billion per year). Most of this amount, USD 80 billion per year, was spent on public investments in agricultural innovation

systems, biosecurity services and off-farm infrastructure. Moreover, despite the importance of these investments for climate change and food systems goals, they have been falling relative to the size of the sector for most of the past two decades. Overall, support to general services accounted for 13% of total transfers to the sector in 2019-21, down from 16% two decades earlier.

Subsidies to consumers (such as food assistance programmes) accounted for USD 100 billion per year over 2019-21, representing 2.8% of consumer expenditures at the farm gate. While consumers in some countries also benefitted from the suppressed prices, on average this was not sufficient to offset the higher prices faced by consumers in other countries.

The Russian invasion of Ukraine is already having major impacts on food, feed and fertiliser markets

The Russian large-scale aggression against Ukraine is having major impacts on markets for food, feed, fertilisers and energy. While overall availability remains sufficient at this stage, challenges are already arising from higher prices for these commodities. However, as the impacts of the Russian invasion continue, supply pressures may also increase. Policymakers will need to remain vigilant regarding the impacts on poor countries and consumers.

Several countries are implementing policies to alleviate emerging pressures on their producers and consumers. While some measures, such as reducing import restrictions, facilitate food supply, others may be counter-productive. Export restrictions add to global price and supply pressures and should be avoided or dismantled rapidly. Relaxing environmental restrictions to boost domestic production may also have pro-cyclical effects, and come at the cost of reducing sustainability.

Agriculture must reduce its emissions while simultaneously adapting to climate change

In addition to current short-term crises, which triggered significant policy responses, agriculture faces a large and longer-lasting shock that has major implications for policies in the sector. Climate change is a uniquely complex challenge for agriculture: while particularly vulnerable to its effects, the sector is also a major source of global greenhouse gas (GHG) emissions. There are ample opportunities for agriculture to reduce these emissions. Moreover, agriculture is one of the few sectors able to contribute positively to combatting climate change by removing carbon from the atmosphere and sequestering it in soils and biomass.

There are also particular challenges in tackling GHG emissions in agriculture, given both the extent of policy intervention and the sector's importance for a range of social goals. There are important questions about the extent to which existing policies help or hinder efforts to mitigate climate change, and about what more could be done. Climate goals also need to be achieved in parallel with other aspects of the triple challenge facing food systems: providing adequate, affordable, safe and nutritious food for a growing global population; providing livelihoods all along the food value chain; and doing so while increasing the environmental sustainability of the sector.

Agriculture contributes to emissions both directly, through on-farm emissions linked to production which are important sources of non-CO_2 gases, notably methane and nitrous oxide, and indirectly, through land use change due to agricultural expansion (land use, land use change and forestry, or LULUCF). Overall, agriculture, forestry and other land use (AFOLU) represents around one-fifth (22%) of anthropogenic GHG emissions. Half of this stems from CO_2 emissions resulting from LULUCF, the other half stems from on-farm emissions of methane and nitrous oxide which have a significantly higher warming potential than CO_2, and in the case of methane, a much stronger impact on the short term.

Direct GHG emissions from agriculture vary across countries due to differences in agricultural land area, size of the agricultural sector, mix of commodities produced, and production methods. Across all 54 countries, livestock account for two-thirds of direct emissions from agriculture, through enteric fermentation, manure management and manure left on pasture. Rice cultivation is also a significant source of methane, and is responsible for 11% of direct agricultural emissions across all 54 countries. The rest of direct emissions – about one-fifth – come from N_2O emissions due to fertiliser applied to agricultural soils. Across all these areas, there is a wide variation among countries.

Countries can mitigate GHG emissions from agriculture through *supply* or *demand side* approaches. On the *supply side*, they can: (i) reduce direct on-farm emissions from agricultural production (e.g. by increasing productivity and the efficiency in input use through better technology and management, as well as specific technical options reducing agricultural emissions); (ii) reduce indirect emissions from land use change and increase carbon stocks in agricultural soils (by reducing the expansion of agricultural land, including through advances in productivity, restoring degraded agricultural lands, increasing soil carbon sequestration on cropland and grassland, and afforestation); and (iii) reduce emissions from food losses, by limiting losses in the field and post-harvest losses on the farm. On the *demand side*, they can focus on shifting consumer demand through changes in dietary preferences, encouraging consumption of products with lower emission intensities, and reducing household food waste.

The 54 countries covered in this report contribute about two-thirds of total global agricultural GHG emissions, of which 16 have set some form of mitigation target for their agricultural sector

The 54 countries covered in this report contribute about two-thirds of total global agricultural GHG emissions. While economy-wide emissions reduction targets generally cover agriculture as well, agriculture-specific targets can be helpful for focusing mitigation efforts and for measuring progress. That said, only 16 of the 54 countries have set some form of mitigation target for their agricultural sector, and there is significant scope to intensify and accelerate emissions reduction in the sector.

In many countries covered by this report, agricultural mitigation policies focus on innovation-led productivity growth and improved production methods to reduce the emissions intensity of agriculture. While these provide significant opportunities, they are likely not sufficient to achieve the overall emission reductions required. In contrast, use of direct incentives for reducing agricultural emissions, either through carbon pricing or equivalent regulatory measures, remains limited, even where pricing schemes have been developed for other sectors.

Additionally, existing support policies can also contribute to increasing agricultural emissions. Significant levels of support continue to be provided to high-emission commodities, such as beef and veal, sheep meat, and rice, representing between 8% and 15% of those commodities' gross receipts. Most producer support also continues to be provided through measures that have the greatest potential to harm the environment, including through higher GHG emissions. Indeed, the slowdown in agricultural policy reforms across the OECD has been associated with weaker progress in improving environmental outcomes.

There are both synergies and trade-offs between climate mitigation efforts and policies required to address the other aspects of the triple challenge facing food systems related to food security, livelihoods and sustainability. For instance, policies targeting the environmental performance of the sector may reduce agricultural emissions but may also result in lower production and farm incomes.

A policy agenda to achieve both food systems and climate objectives would contain six elements:

There is considerable scope for reforms that support both food systems objectives and ensure that agriculture contributes to ambitious emission reduction targets in line with the Paris goal to limit the increase in global temperatures to less than 2°C, and preferably no more than 1.5°C, above pre-industrial levels. Policy reforms should cover six complementary elements:

1. **Phase out market price support and payments with strong potential to harm the environment and to distort markets and trade**. Payments based on output and on the unconstrained use of variable inputs, together with market price support, are known for their potential to increase pressures on natural resources and to raise national GHG emissions. Even though the global effect of removing market price support is uncertain, these measures potentially contribute to higher national GHG emissions. These types of support are also potentially most production- and trade-distorting, are inefficient tools for transferring income to farmers, and tend to be inequitable, as they are not targeted to producers with low incomes.
2. **Re-orient budgetary support to the provision of public goods and key general services** to improve the performance of the agricultural sector, or increase it where current budgetary support is low. Most current payments neither incentivise nor facilitate more sustainable agricultural production and reduced GHG emissions, although environmental compliance requirements may partly address this gap. Directly paying farmers to supply public goods, such as ecosystem services or carbon sequestration in agricultural soils, and to adopt resource-saving production practices, both helps reduce emissions and provides farmers with new sources of income. Re-orienting expenditures to innovation, particularly R&D on emission-reducing technologies and production methods, should support mitigation and foster sustainable productivity growth, thereby also reducing income pressures from stricter environmental and emission standards.
3. **Target income support to those households most in need**. Transitional assistance and extended social safety nets may be required for poorer farm and other households to offset income losses from the removal of positive price support, or the higher food costs associated with the removal of negative price support. This will require better information on incomes and assets of farm households. Savings from reform of poorly targeted support could also generate significant additional funds for public goods.
4. **Enhance the resilience toolkit for a world of diverse risks and increasing extreme weather events and natural disasters.** Investments in relevant data, tools and skills enable small- and medium-scale risks to be covered by farmers themselves or insured through market instruments. Large-scale risks will still need to be covered by governments, through well-defined policies to avoid crowding out private risk management.
5. **Implement an effective pricing system for agricultural GHG emissions to incentivise the transition to low-emission agriculture**. Abatement subsidies may offer an alternative but may be challenging to maintain with rising mitigation needs over time.
6. Where agriculture is not included in broad carbon pricing or equivalent schemes, or complementing those, develop a package of approaches to ensure significant emissions reductions in agriculture. Governments can act across supply and demand sides to reduce emissions in agriculture. This includes supply side efforts to increase productivity and efficiency in input use; adopting production techniques to reduce emissions; increasing soil carbon sequestration; afforestation and restoring degraded lands; and reducing food losses in the field and on the farm. On the demand side, they can focus on providing information and incentives to consumers to shift the emissions intensity of their food choices, and to reduce household food waste. Coordinated action and international cooperation would increase the efficiency of measures.

These reforms would both improve the performance of agricultural and food systems and make a greater contribution to reducing GHG emissions. This important agenda will be taken up further at the OECD Agricultural Ministerial Meeting in November 2022.

1 Reforming agricultural policies for climate change mitigation

This chapter analyses current policies and outlines policy reform avenues towards mitigating greenhouse gas (GHG) emissions in agriculture. It first presents agriculture's contribution to climate change, both through direct emissions linked to on-farm production, and indirectly through land use change. The chapter then outlines opportunities for agriculture to contribute to climate change mitigation, either by reducing its emissions or through carbon sequestration within agricultural biomass and soils. A comprehensive overview of what the 54 countries covered in OECD's *Agricultural Policy Monitoring and Evaluation 2022* are doing to contribute to climate change mitigation highlights strategies and mitigation targets, and specific measures implemented. The final section discusses the impacts of current agricultural support policies on GHG emissions. The chapter concludes with key recommendations for reforming agricultural policies to address climate change mitigation objectives.

Agriculture faces a complex and unique challenge in the context of climate change. First, agriculture is particularly vulnerable to climate change, due to its dependency on weather and climatic conditions. It is already experiencing negative impacts from climate change from higher temperatures, increased variability of rainfall, invasive pests, and the greater frequency of extreme weather events. Around the world, building the resilience of the sector and ensuring adaptation to climate change is a significant challenge, particularly in the poorest countries in which agriculture both plays an important role for the economy and basic subsistence needs, but where climate change impacts are expected to hit the hardest.

Second, agriculture is itself a major source of global greenhouse gas (GHG) emissions, both directly, through on-farm emissions linked to production, and indirectly, through land use change due to agricultural expansion. In the absence of action, emissions from agriculture are projected to continue to rise and the sector's share of total emissions to increase as efforts to decarbonise other sectors accelerate. That said, there are ample opportunities for agriculture to contribute to global efforts to mitigate climate change, by reducing both direct and indirect emissions.

Third, unlike many other emissions-intensive sectors, agriculture also has the potential to contribute positively to reducing emissions by removing carbon from the atmosphere, through efforts to sequester carbon in biomass and soils. This can be achieved through practices that also raise productivity, such as conservation agriculture and the restoration of degraded agricultural lands, both to mitigate direct emissions and prevent further indirect emissions from land use change.

There are also particular challenges to tackling GHG emissions in agriculture. The sector is subject to a wide range of government policies, including significant support policies in OECD countries. A key question is thus the extent to which existing policies help or hinder efforts to adapt to, or mitigate climate change in agriculture. Equally as important is examining the types of mitigation policies that governments have adopted, or are considering, to combat agricultural emissions. With the strategic importance of food security set to increase, as population growth and rising incomes continue to boost extra demand for food, agriculture lies at the heart of the triple challenge facing food systems: providing adequate, affordable, safe and nutritious food for a growing global population; providing livelihoods all along the food value chain; and doing so while increasing the sustainability of the sector and its contribution to combatting climate change.

Against this background, this chapter discusses the contribution of agriculture and current agricultural policies to climate change and how policy changes can help the sector to become a greater part of the solution to reducing global GHG emissions. While resilience and adaptation are key issues, they have already been the subject of extensive work (see Box 1.1) and are not covered further here. Furthermore, while GHG emissions from other pre- and post-production segments of food systems have witnessed substantial increases in recent decades, this chapter focuses on the contribution of agriculture and closely related issues where agricultural policymakers may be more directly involved (such as food loss and waste and consumer demand). The chapter begins with an overview of agriculture's contribution to climate change; it then discusses the opportunities for the sector to contribute to emission reductions. The chapter then looks ahead to country targets under the Paris Agreement and policy actions taken by countries to mitigate agricultural emissions. It concludes by discussing the extent to which current agricultural support policies may help or hinder global efforts to mitigate GHG emissions, and offers a way forward with recommendations for countries to reform their agricultural policies to address climate change mitigation objectives.

Box 1.1. Adaptation to climate change and resilience of the agricultural sector

According to the Intergovernmental Panel on Climate Change (IPCC), global temperatures have already increased by 1.1°C on average over the past decade, compared to preindustrial levels (IPCC, 2022[1]). As a consequence, human activities are already exposed to changing climatic patterns, highlighting the urgent need for effective mitigation action. While agriculture has strong potential to contribute to GHG emissions reduction and carbon sequestration efforts, it is also among the most exposed sectors to changing weather patterns and natural disasters. Low income countries are particularly vulnerable, as a large part of their population still depends on agricultural activities for their livelihoods and rural poverty is at the core of many development challenges.

For these reasons, climate change mitigation needs to be complemented by adaptation efforts, and agriculture needs to find new and innovative pathways combining these two transformation agendas. Adaptation strategies can rely on both the adoption of new management practices (e.g. crop diversification, improved water management) that are better suited to the changed environmental conditions, and new technologies (e.g. flood or heat-resistant crop varieties) supported by R&D investments (Ignaciuk and Mason-D'Croz, 2014[2]).

In the face of increasingly unpredictable climatic events, agriculture also needs to strengthen its resilience – defined as its ability to prepare and plan for, absorb, recover from, and more successfully adapt and transform in the face of shocks – by revising its approach to risk (OECD, 2020[3]). In particular, risk management should move from focusing on individual agents to a more systemic perspective, and involve different decision levels. Policies should be put in place to not only help farmers to recover from various shocks, but also to build capacities to adapt in response to new risks, and to transform in order to eliminate these risks to the best possible extent.

OECD work has emphasised five dimensions that should be considered by public and private actors when designing their risk management strategies in agriculture (OECD, 2020[3]). These should pay attention to: 1) the time-frame, taking early ex-ante actions and targeting for the long-term; 2) possible trade-offs between policy objectives and actor interests, comparing outcomes of alternative options; 3) participatory collaborative processes involving multiple stakeholders; 4) investments in on-farm resilience capacity, based on strengthening human capital and supporting the uptake of adapted technologies and practices; 5) no regret policies, taking into account of possible future scenarios on climate change and other economic and environmental conditions.

Country case studies underscore how this framework for agricultural resilience can help address natural disasters faced by the agricultural sector (OECD/FAO, 2021[4]). Key elements include setting the right incentives at policy level to trigger action at the farm level; providing the data to help farmers choose the right strategic investments on the farm; and engaging with trusted stakeholders to help ensure the effective implementation of policy actions by farmers.

Measuring agriculture's contribution to climate change

Direct and indirect emissions

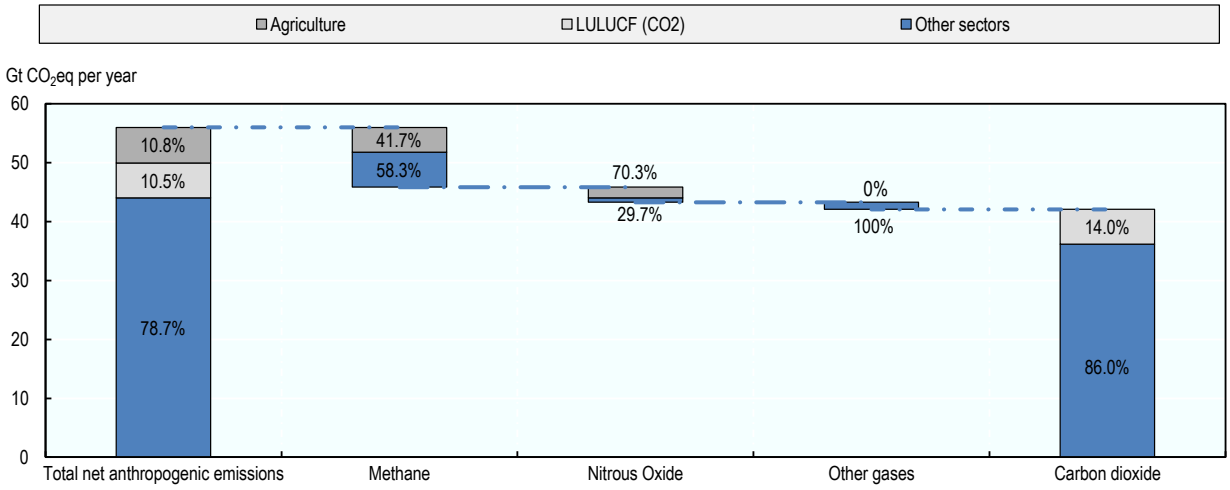
Agriculture is a major driver of climate change via two main channels:

- Emissions from the sector itself, linked to production. In particular, the agricultural sector is a major source of non-CO_2 emissions, notably methane (CH_4) and nitrous oxide (N_2O) directly emitted from crop and livestock production.[1]

- Emissions related to land use, land use change and forestry (LULUCF).[2] The main sources of LULUCF emissions related to agriculture include net forest conversion to cropland and pasture, conversion of native grasslands to cropland, tropical forest fires, peat fires, soil organic carbon changes and drained organic soils (Figure 1.1).

Together, both these elements – agriculture and LULUCF – are referred to as agriculture, forestry, and other land use (AFOLU). Over the period from 2010 to 2019, average annual net GHG emissions from AFOLU represented around 21% of total global anthropogenic GHG emissions, and that share increased to 22% by 2019.[3] Of this, emissions from LULUCF accounted for around 11% of global GHG emissions,[4] while on-farm emissions linked to agricultural production accounted for a further 11%.[5] In other words, AFOLU represents roughly one-fifth of anthropogenic GHG emissions, half of which comes from CO_2 LULUCF emissions and the other half from CH_4 and N_2O direct emissions from agricultural production.

Figure 1.1. Global net anthropogenic emissions from agriculture, forestry and other land use (AFOLU) and other sectors, total and decomposition by gas, annual average for 2010-19



Note: LULUCF: Land use, land use change and forestry. Data labels indicate the percentage share of Agriculture, LULUCF (CO_2) and Other sectors in the total emissions from each individual GHG, as well as total global net anthropogenic GHG emissions. Other sectors correspond to buildings, transport, industry, other energy, and also include fossil fuel emissions at farm level, consistent with IPCC nomenclature. Other gases include fluorinated gases such as chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). All values expressed in units of CO_2eq are based on IPCC AR6 100-year Global Warming Potential (GWP_{100}) values with climate-carbon feedbacks (CH_4 = 27.0; N_2O = 273). LULUCF only shows CO_2 emissions, as reported in IPCC (2022[5]). Non-CO_2 LULUCF emissions (not shown) represent an additional 0.6 $GtCO_2$eq, due to emissions from vegetation and peatland burnings.
Source: Compiled from IPCC (2022[5]) and EDGAR (Minx et al., 2021[6]).

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Direct on-farm emissions from agriculture contribute much more to non-CO_2 gases than other sectors: they generate 42% of global anthropogenic methane emissions and 70% of global nitrous oxide emissions.[6] These gases have a much higher impact on global warming than CO_2, and the 100-year global warming potential (GWP_{100})[7] of methane has been regularly revised upward over the past two decades by the IPCC (from 21 in 1995 to 27 currently for agriculture). Furthermore, methane is a short-lived gas, which means its climate impact is much stronger over a shorter time-frame, whereas its effect becomes negligible faster when compared with carbon dioxide. That is, the GWP for non-fossil methane increases from 27 over a 100-year period to close to 80 over a time horizon of 20 years. This means that methane emissions are

set to have an effect on global temperatures by mid-century about three times larger than indicated by the usual calculations which take a 100-year perspective.

Indirect emissions from agriculture are mainly CO_2 emissions, particularly from the clearing of forests and other natural vegetation and the drainage of wetlands and peatlands for agricultural purposes. Land clearing removes carbon stored in above-ground biomass, while organic soil drainage leads to the oxidation of soil carbon, and this important below-ground carbon sink continues to emit for many years following the land conversion. The burning of biomass on agricultural and forest land and the combustion of organic soils (peatland fires) also contribute to GHG emissions from forestry and other land use.

On the other hand, agriculture can also contribute to GHG removals, through carbon sequestration in agricultural plantations, and in cropland and grassland soils, as well as partially rewetted peatlands (Henderson et al., 2022[7]). Overall, the capacity of land to act as a natural sink of CO_2 will be affected by both climate change and by future agricultural activities (IPCC, 2022[5]).

Global emissions of carbon dioxide from AFOLU have remained relatively constant over the past few decades. In contrast, non-CO_2 emissions from AFOLU increased by 15% between 1990 and 2019. This was primarily driven by direct agricultural emissions, which represented 91% of AFOLU's non-CO_2 emissions on average over the period.[8]

Direct GHG emissions from agriculture vary across countries due to differences in factors such as agricultural land area, size of the agricultural sector, mix of commodities produced, and the structure of agricultural production. Total agricultural GHG emissions across all 54 countries covered in this report contribute about two-thirds of total global agricultural GHG emissions.[9] The five largest emitters are India, the People's Republic of China (hereafter "China"), the United States, Brazil and the EU-27, collectively accounting for 72% of the total across all 54 countries. Conversely, the five smallest emitters (Iceland, Israel, Costa Rica, Norway and Switzerland) represent just 0.4% of total agricultural GHG emissions (see Figure 1.2 for direct agricultural GHG emissions in 2019 from these 54 countries). To allow the relevant compositional breakdown to be legible, this chart is presented in total, and then as three separate charts covering groups of countries according to the size of their agricultural emissions: low, medium and high.

Enteric fermentation and **manure management** from livestock account for more than 50% of direct emissions from agriculture across all 54 countries. Enteric fermentation, a digestive process of cattle, sheep, goats and other ruminant livestock which generates methane, accounts for the vast majority of these emissions (42% of direct agricultural emissions). Manure management contributes 8%, both from methane and nitrous oxide emissions. The share of these livestock emissions in total agricultural emissions varies across the 54 countries covered in this report, ranging from 19% in the Philippines to 78% in Australia and New Zealand. Livestock is also responsible for additional emissions due to manure deposition on grassland and manure applications to croplands (see further below on agricultural soils). When manure left on pasture is added to the sources above, livestock accounts in total for two-thirds of agricultural emissions over the 54 countries covered.[10]

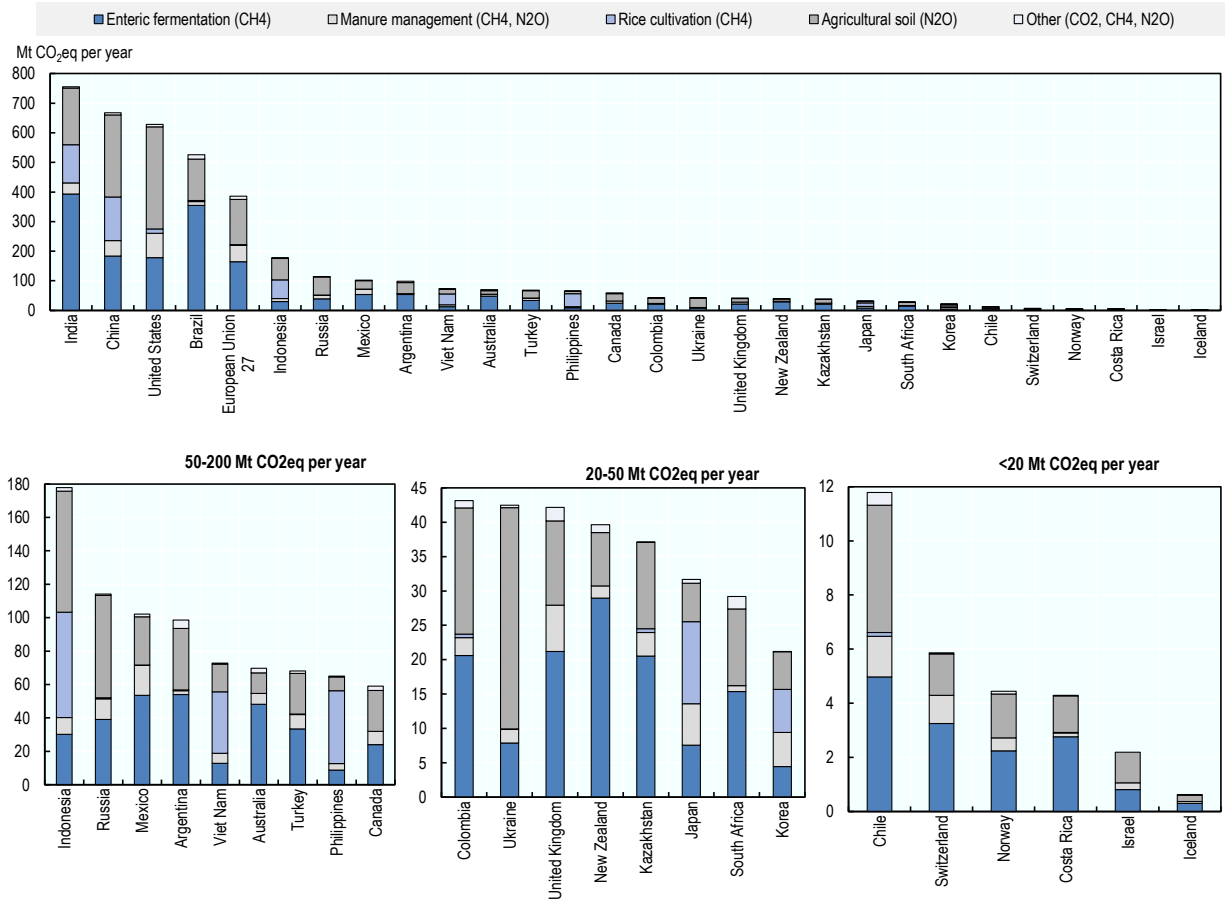
Rice cultivation is also a significant source of methane emissions, and is responsible for 11% of direct agricultural emissions across the 54 countries. These emissions are concentrated in Asia, with five countries (China, India, Indonesia, the Philippines and Viet Nam) collectively accounting for 67% of global rice production and 91% of total emissions from rice cultivation across the 54 countries (OECD/FAO, 2021[8]). On average across the OECD, rice cultivation only represents 2% of direct emissions from agriculture.

Agricultural soils are the principal driver of nitrous oxide emissions, due to the application of synthetic nitrogen or organic fertiliser, crop residues, as well as manure and urine deposited on grassland by ruminant livestock. These emissions account for 37% of direct agricultural emissions across all 54 countries, but with high variation across countries: agricultural soils account for 76% of direct

agricultural emissions in Ukraine, and more than half of total agricultural emissions in Israel and the United States.

Other sources of direct agricultural emissions come from more marginal sources across all 54 countries, and represent only 2% of total agricultural emissions. These include carbon dioxide from liming, urea application and other carbon-containing fertilisers as well as methane and nitrous oxide from prescribed burning of savannahs and field burning of agricultural residues. In addition, some on-farm emission sources are not accounted for as direct agricultural emissions under the UNFCCC inventory typology, but can be non-marginal: they cover in particular energy consumption on the farm, such as fuel for agricultural machinery, other energy sources used for barns and glasshouses, as well as irrigation. Box 1.2 provides more detail on these sources, including accounting of GHG emissions through a food systems lens.

Figure 1.2. Direct GHG emissions from agriculture, by country and source, 2019



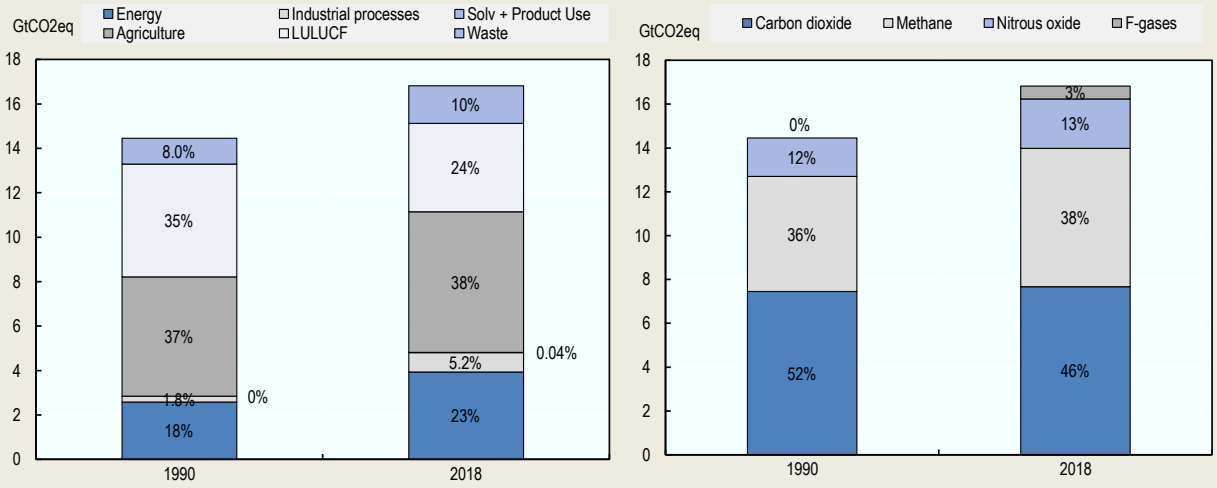
Note: Data from 2019, except for Chile, Israel, Korea (2018); Mexico (2015); Colombia and Argentina (2014). CO_2: Carbon Dioxide, CH_4: Methane, N_2O: Nitrous oxide.
Source: (OECD.Stat, 2021[9]).

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Box 1.2. How do food systems contribute to global GHG emissions?

In addition to the emissions generated by agricultural production, land use and land use change, food systems contribute to GHG emissions through various pre- and post-production processes such as fertiliser manufacturing, food processing, packaging, transport, retail, household consumption and food waste disposal. However, there are major knowledge gaps and large uncertainties regarding the quantification of food systems emissions. Estimates from (IPCC, 2022[10]) based on (Crippa et al., 2021[11]) and (FAO, 2021[12]) indicate that food systems emitted 16.8 $GtCO_2eq$ per year in 2018 (95% confidence range: 13-23 $GtCO_2eq$ per year), equivalent to 31% (range 23-42%) of total anthropogenic GHG emissions.[11] This represents an increase of 16% over 1990 levels, primarily driven by non-AFOLU emissions which have grown to represent 39% of food systems emissions in 2018 (compared with 28% in 1990) (Figure 1.3).

Figure 1.3. GHG emissions from global food systems by sector and gas, 1990 and 2018



Note: Solv+Product Use: Solvent and Other Product Use. LULUCF: Land Use, Land-Use Change and Forestry. Data labels indicate the percentage share of each individual sector/gas in total global net anthropogenic GHG emissions.
Source: (IPCC, 2022[10]).

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Emissions from energy use occur throughout the food supply chain and consist almost entirely of CO_2 emissions. In 2018, two-thirds of energy emissions came from energy industries supplying electricity and heat, manufacturing and construction, and transport. Refrigeration is an important source of energy use in the retail sector, and leads to substantial increases in fuel consumption during distribution. Refrigeration in supermarkets is energy intensive and also contributes to leakages of fluorinated gases (F-gases). Transport represents just 5-6% of food systems emissions and is dominated by road transport (92% of food systems transport emissions), followed by marine shipping (4%), rail (3%) and aviation (1%).

Emissions from industrial processes in food systems consist of emissions from refrigerants (F-gases) and the fertiliser industry (CO_2 from ammonia production and N_2O from nitric acid). Emissions from F-gases can have disproportionately large effects on global temperatures even at small atmospheric concentrations. Although F-gases contributed only 3% of global food systems emissions in 2018, this share

is projected to increase rapidly due to growth in cold chains and refrigerated storage capacity in developing countries.

Waste accounts for 10% of food systems emissions, and includes domestic and commercial wastewater (55% of food systems waste emissions), solid waste management (36%), industrial wastewater (8%) and waste incineration and other waste management systems (1%). Food waste decay also generates significant quantities of methane, through the decomposition of organic materials in landfills.

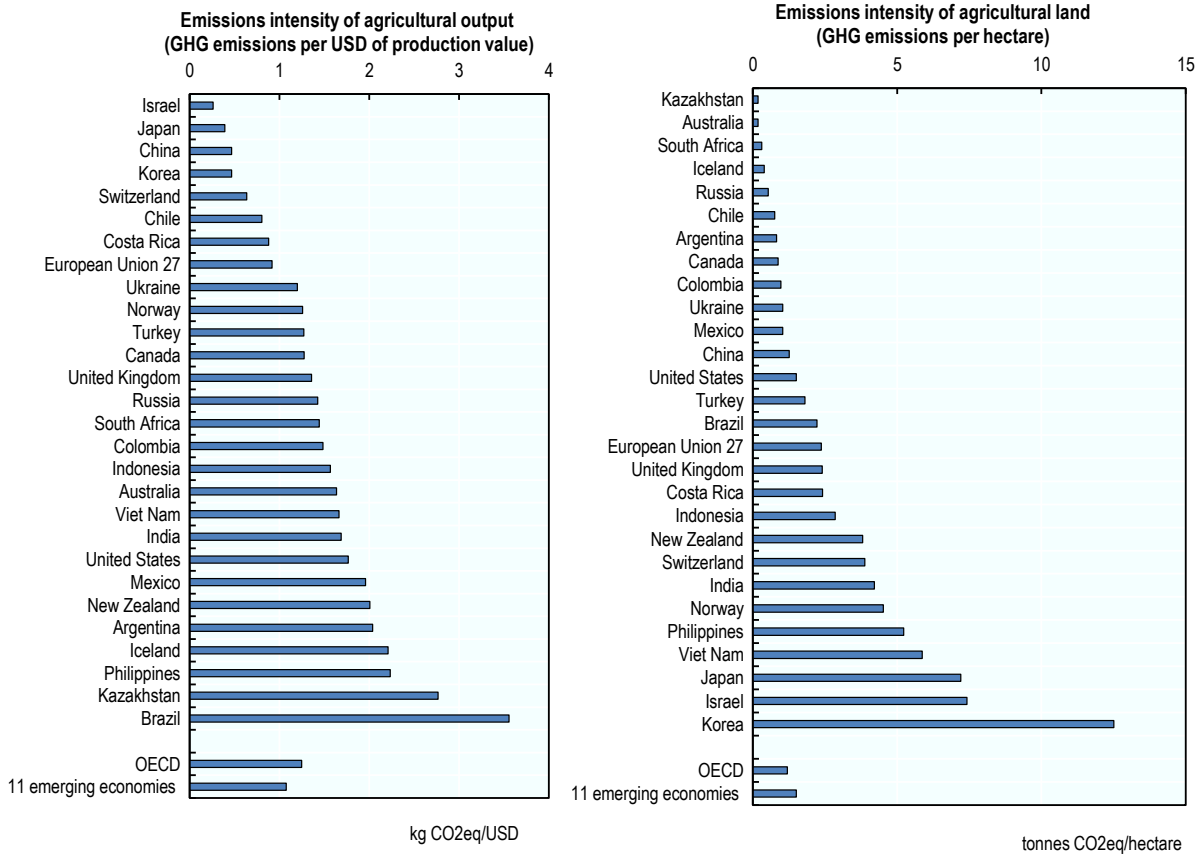
Source: (IPCC, 2022[10]).

Emissions intensity of the agricultural sector

To account for the vast differences in the size of countries' agricultural sectors, emissions can also be expressed relative to agricultural output, or relative to a factor of production, such as agricultural land. Measuring agricultural emissions per USD of production value reveals the ***emissions intensity of agricultural output*** (Figure 1.4). Countries with a strong share of ruminant products in agricultural production (e.g. Brazil, Argentina, New Zealand, Mexico) or low domestic market prices (e.g. Kazakhstan, Philippines) rank the highest. On the other hand, countries with high value of production (e.g. Japan, Korea, Switzerland) and/or low share of ruminant products (e.g. China) tend to show a low emission intensity of agriculture. Overall, the emissions intensity of agricultural output in the OECD is slightly higher than in the 11 emerging economies covered in this report.[12]

When looking at the ***emissions intensity of agricultural land****,* measured as agricultural emissions relative to total agricultural land area, countries with large territories such as Australia, Kazakhstan and South Africa tend to have the lowest agricultural emissions per hectare. Agricultural emissions per hectare tend to be higher in countries with a relatively small agricultural area, and where emissions-intensive commodities (e.g. rice cultivation in Korea, Japan, Viet Nam and the Philippines; or livestock production in Norway, Switzerland and New Zealand) represent an important share of agricultural production. In addition to geographical characteristics, differences across countries can also be explained by variations in production systems and the extent to which land contributes to output relative to other factors of production. By this metric, agricultural emissions per hectare in the OECD are lower than the average for the 11 emerging economies.[13] However, it is important to note that this indicator does not capture indirect agricultural emissions (i.e. those relating to changes in land use), which are substantial in a number of countries. High land emissions intensity, when driven by production intensification, may also result in GHG emissions offsets associated with reduced land use expansion.

Figure 1.4. Emissions intensity of agricultural output and land across countries



Notes: Data is from 2019, except for Canada, Chile, Israel, Korea (2018); Mexico (2015); Argentina and Colombia (2014). The emissions intensity of agricultural output is calculated as the ratio of direct GHG emissions from agriculture to the value of agricultural production. Agricultural GHG emissions per hectare is calculated as the ratio of direct GHG emissions from agriculture to total agricultural land area.
The OECD total does not include the non-OECD EU Member States.
The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
Source: OECD.Stat (2021), Agri-environmental indicators, https://stats.oecd.org/# ; OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

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GHG emissions intensities also vary significantly when comparing across food commodities. Poore and Nemecek (2018[13]) provide estimates of GHG emissions intensities, expressed in kg CO_2eq per kg of product and per nutritional functional unit (e.g. 100g of protein) for more than 40 commodities (Figure 1.5).[14] Emissions intensities are measured using attributional Life Cycle Assessment considering the full supply chain.

On average, emissions intensities are highest for ruminant meat, notably beef from beef herds, and lamb.[15] Emissions from dairy systems are shared between milk and meat production, resulting in a lower carbon footprint for beef from dairy cattle.[16] Emissions intensities are significantly lower for plant-based food products. While rice is more emissions intensive, most other grains generate relatively low emissions per unit of product, and most fruits, vegetables, roots and tubers have even lower average emissions.[17]

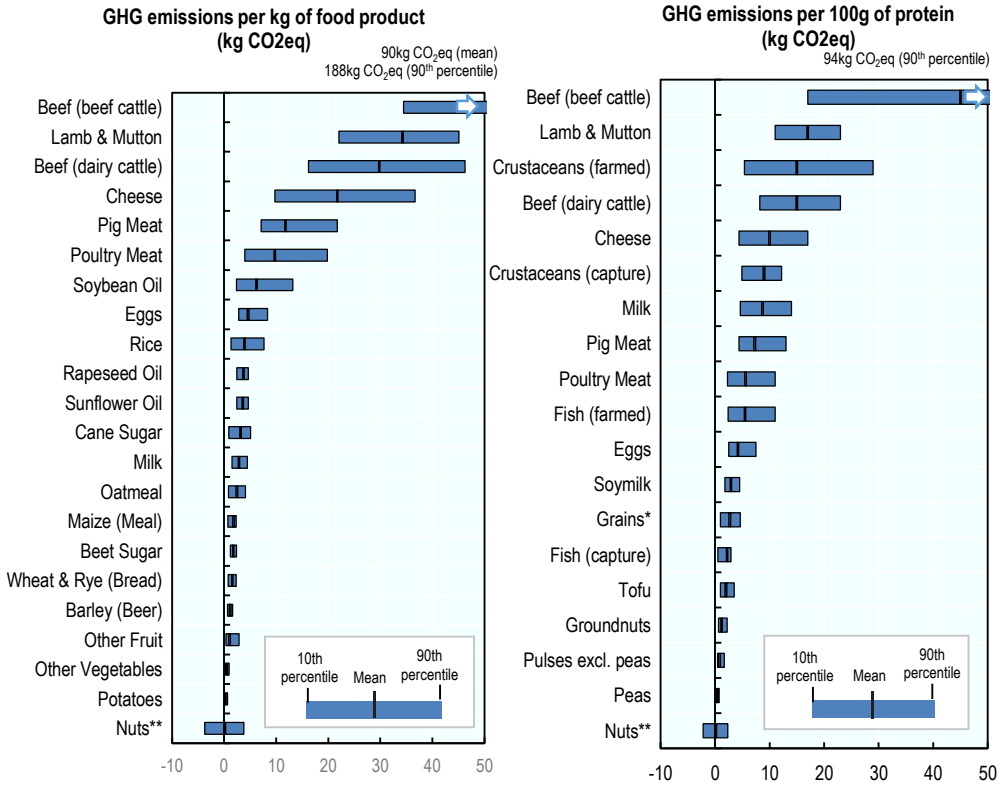
GHG emission intensities for individual products also vary considerably when considering the full heterogeneity of farms, depending on where and how the relevant product is produced (Figure 1.5). For

example, the highest emissions from **beef** producers are more than five times greater than those from the lowest emitters in the case of beef herds, and nearly twelve times those from the least emitting dairy herd producers.[18] This wide variation reflects differences in production systems, which vary in terms of productivity, diet composition, diet quality, and feed use efficiency. Livestock in grazing systems mostly consume grass and tend to have higher emission intensities than mixed crop-livestock systems, where animal feed rations can be more easily optimised. Average emissions intensities are particularly high in grazing systems that lead to the expansion of pasture and hence to additional emissions from land-use change, as well as systems characterised by low feed digestibility, poor animal husbandry and lower slaughter weights (Herrero et al., 2013[14]; Gerber et al., 2013[15]).

Within **major staple crops** such as wheat and maize, the highest emissions per kg are three times greater than those from the lowest emitters. Rice is the most emissions-intensive staple crop, as the production of rice in flooded paddies blocks oxygen from penetrating the soil, facilitating the growth of methane-producing bacteria (Adhya et al., 2014[16]). However, the range of emissions among rice farms can vary considerably, with the highest emissions from rice farms reaching levels six times greater than those of the lowest emitters.

Figure 1.5. GHG emissions intensity of food commodities

Mean, 10th and 90th percentile emissions intensities (per kg of food product and per 100g of protein)



Note: Aggregation of CO_2, CH_4, and N_2O emissions in (Poore and Nemecek, 2018[13]) updated to use IPCC-AR6 100-year GWP. Data for capture fish, crustaceans, and cephalopods from (Parker et al., 2018[17]), with post-farm data from (Poore and Nemecek, 2018[13]), where the ranges represent differences across species groups. CH_4 emissions include emissions from manure management, enteric fermentation, and flooded rice only.

*Grains are not generally classed as protein-rich, but they provide ~41% of global protein intake. Here grains are a weighted average of wheat, maize, oats, and rice by global protein intake (FAO Food Balance Sheets).

**Conversion of annual to perennial crops can lead to carbon sequestration in woody biomass and soil, shown as negative emissions intensity.

Source: (IPCC, 2022[10]); (Poore and Nemecek, 2018[13]).

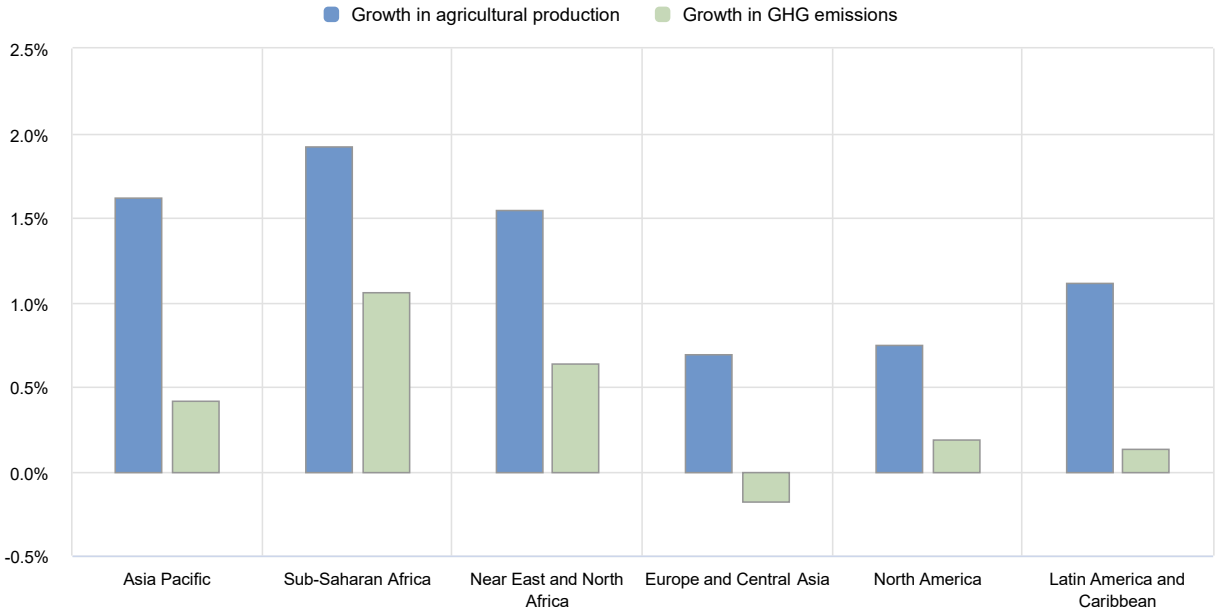
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Looking ahead

With the global population projected to reach 9.7 billion in 2050, agricultural emissions are expected to continue to rise in the coming years. Projections from the *OECD/FAO Agricultural Outlook 2022-2031* forecast that direct emissions from agriculture should grow by 6% between 2019-21 and 2031 (assuming no changes in current policies and on-trend technological progress). Livestock would account for more than 85% of the global increase, and agricultural emissions are expected to rise in nearly all regions over the next decade (except for Europe and Central Asia) (Figure 1.6). Emissions growth should be highest in middle and low-income regions, which are characterised by faster output growth and more emissions-intensive production systems. Most of the increase is to occur in Sub-Saharan Africa, where direct GHG emissions from agriculture are projected to grow by 17% over that period.

That said, in all regions, agricultural production growth is expected to exceed the growth in direct GHG emissions from agriculture, resulting in a partial decoupling of emissions from production and a decline in the carbon intensity of agricultural production over the next decade. The decoupling of emissions from production represents the continuation of a longstanding trend over the past few decades, and will primarily be driven by yield improvements and a decline in the share of ruminant livestock in total agricultural production (OECD/FAO, 2022[18]).

Figure 1.6. Projected annual growth in production and direct GHG emissions from agriculture, 2022-2031



Note: This figure shows projected annual growth in direct GHG emissions from agriculture together with annual growth in the estimated net value of production of crop and livestock commodities covered in the Outlook (measured in constant USD 2014-16 prices). Estimates are based on historical time series from the FAOSTAT Emissions Agriculture databases which are extended with the Outlook database.
Source: (OECD/FAO, 2022[19]).

While longer-term projections vary considerably, most studies predict a continuation of the increase in agricultural GHG emissions by mid-century in the absence of sustained efforts to mitigate these emissions. Under a business-as-usual scenario, FAO (2018[20]) forecasts a 50% expansion in global agricultural output between 2012 and 2050, as well as an 18% increase in harvested areas, a 46% increase in total animal

herd size, a 50% growth in nitrogen fertiliser consumption, and a 20% increase in global agricultural GHG emissions. Increases in agricultural emissions could easily exceed 50% over the same time period if less favourable conditions are considered (OECD, 2016[21]; Popp et al., 2017[22]; Springmann et al., 2018[23]).

Opportunities for agriculture to contribute to climate change mitigation

As a major source of global GHG emissions, agriculture has an important role to play in helping to meet the world's climate change mitigation objectives. Indeed, the Paris Agreement targets will remain out of reach if mitigation efforts do not include the agriculture and food sectors (Clark et al., 2020[24]). The latest assessment report from the IPCC finds that rapid deployment of mitigation measures in AFOLU will make an essential contribution to all potential pathways to limit the increase in global temperatures to 1.5°C above pre-industrial levels (IPCC, 2022[5]). Based on integrated assessment modelling and technical bottom-up studies, it is estimated that AFOLU as a whole could contribute 20-30% of global mitigation efforts for a 1.5°C or 2°C pathway by 2050, at a relatively modest cost (IPCC, 2022[5]). The largest share of this reduction would come from the protection and restoration of forests and other natural ecosystems, with a smaller but still important contribution coming from agriculture alone (OECD, 2019[25]).

There are two major areas of opportunity for the agricultural sector to mitigate GHG emissions:

- *Supply side options.* These involve different areas of intervention aimed at various stages of the production process:
  - *Reducing direct on-farm emissions from agricultural production:* increasing productivity and efficiency in input use through better technology and management, as well as specific technical options reducing agricultural emissions.
  - *Reducing indirect emissions from land use change and increasing carbon stocks in agricultural soils:* reducing the expansion of agricultural land, including through advances in land productivity, restoring degraded lands and rewetting drained peatland, increasing soil carbon sequestration on cropland and grassland, and afforestation.
  - *Reducing emissions from food losses:* limiting losses in the field, and post-harvest losses on the farm.
- *Demand side options.* These options correspond to changes in the demand for agricultural products, at the consumer level, due to changes in dietary preferences, purchase of food with lower embedded emission and reductions of food waste, all leading to lower emission footprint at consumer level.

In addition, agriculture can contribute to some extent to global mitigation through bioenergy production. These options do not primarily aim at reducing agricultural emissions, but rather to use agricultural production to reduce emissions from fossil fuels in other sectors (see Box 1.4).

This section provides more details on these technical options, both on the supply and the demand side, followed by an overview of their mitigation potentials.

Reducing direct on-farm emissions from agricultural production

On-farm emissions mostly relate to non-CO_2 emissions associated with fertiliser use, rice cultivation and, in the case of the livestock sector, enteric fermentation, manure management and manure deposition on soil. Some fossil fuels are also consumed on the farm, for the use of machinery, irrigation, heating of barns, etc., and can form part of mitigation efforts, even if they are not directly accounted as part of the AFOLU sector.

Crop cultivation emissions reduction

For many crops, the largest source of emissions is nitrous oxide related to the use of synthetic or organic fertilisers. Improved cultivation practices and more efficient usage of synthetic fertilisers and organic manure have allowed many countries to reduce their nitrous oxide emissions, while steadily expanding agricultural production. However, considerable scope remains to reduce emissions without compromising productivity and food security, as 45% of nitrogen added to fields globally is not absorbed by crops (Blandford and Hassapoyannes, 2018[26]). Advances in precision agriculture and the use of nitrification and urease inhibitors can further enhance the management of crop nutrient cycling, but should be complemented by more holistic approaches, relying on integrated crop management and improved crop rotations (e.g. with legumes and cover crops), as well as crop-livestock systems integration.

Irrigated rice is a significant source of methane emissions, generated by the area flooded for its cultivation. Bacterial methane production in rice paddies can be strongly influenced by changes in water management regimes, such as the duration of flooding intervals and frequency of flooding. Midseason drainage, a common irrigation practice in China and Japan, along with intermittent irrigation in northwest India, can result in significantly lower methane emissions (Wassmann, Hosen and Sumfleth, 2009[27]). Improvements in rice yields can also help to reduce emissions from rice cultivation, although there can be trade-offs between improved water management to reduce methane emissions, and offsetting increased emissions from fertiliser use, and yield size.

Livestock emissions reduction

As noted above, the most prominent source of GHG emissions in agriculture is from enteric fermentation of ruminant livestock, with beef having the largest emissions footprint globally by a wide margin per unit of protein produced (Blandford and Hassapoyannes, 2018[26]). On the supply side, the emissions intensity of ruminant products can be reduced through improved productivity at the animal or herd level, or via more direct interventions aimed at limiting enteric fermentation.

Increasing feed conversion efficiency in livestock production can be achieved through advances in herd genetics, improving feed and pasture quality, and strengthening farm and animal management, including through disease prevention (MacLeod et al., 2015[28]). All these options also allow for higher production and larger incomes for a given number of animal heads. Due to the large heterogeneity in livestock productivity and emission intensities around the world (Herrero et al., 2013[14]), they could be particularly useful in low and middle income countries to deliver jointly climate mitigation and improvements in food security and nutrition. For advanced economies, the use of methane inhibitors appears more promising, with new technologies being developed, such as chemically synthesised inhibitors, specific species of seaweed that could be used as feed supplements, and anti-methanogen vaccine solutions (Reisinger et al., 2021[29]). Many of these options have been intensively studied over the past decade and could soon become available commercially. That said, questions remain as to their long term efficacy and effects on animal health and productivity, their social acceptability and the required regulatory framework. Feed supplement options may also not be well placed to address emissions from extensive agricultural systems where ruminants are largely grass-fed.

Manure management also contributes significantly to livestock GHG emissions. Options to limit associated CH_4 and N_2O emissions include improved application methods, storage and composting, the use of nitrification inhibitors for stored manure and urine patches, alteration of animal diets and grazing practices, manure acidification and solid liquid separation, and the use of anaerobic biodigesters. Such options have already been widely deployed in some regions, with small and large-scale biodigesters producing biogas. While emissions abatement estimates for such mitigation technologies are more limited than for enteric fermentation, reduction potentials exist, in particular in developed regions and for intensive management systems (IPCC, 2022[5]).

Other on-farm emissions

On-farm energy consumption from electricity, heat and fuels is an important source of emissions. Various technologies exist to reduce these emissions, including switching to renewable sources of energy such as solar and wind power, and adopting greener and more efficient fuels to power agricultural machinery. The deployment of renewable energies on agricultural land can also provide farmers with an opportunity to earn additional income, for example with special fees for locating wind turbines on their land (the electricity production from which then contributes to the decarbonisation of other sectors). The share of emissions associated with on-farm energy consumption remains small compared to other AFOLU sources, but studies suggest these categories could be relatively cheap to abate and more easily adopted by the farming community (MacLeod et al., 2015[28]).

Reducing land use change emissions and increasing carbon stocks in agricultural soils

While productivity improvements in agriculture have reduced the need for agricultural land expansion (see Box 1.3), land use change emissions from agriculture have nonetheless been considerable, due to conversion of forests, grasslands and other carbon stocks into cropland or pastures. Agriculture currently uses approximately half of the world's habitable land (IPCC, 2019[30]). Livestock occupies about 78% (40 million km^2) of all agricultural land; this includes 35% of global crop production which is devoted to the production of animal feed (Dasgupta, 2021[31]). Empirical studies have shown that agricultural expansion is among the largest drivers of deforestation and degradation worldwide (Busch and Ferretti-Gallon, 2017[32]; Curtis et al., 2018[33]). Recent estimates suggest that large-scale commercial agriculture (i.e. cattle ranching, soy production and palm oil plantations) accounts for about 40% of tropical and sub-tropical deforestation, while local subsistence agriculture is responsible for a further 33% (Hosonuma et al., 2012[34]; FAO and UNEP, 2020[35]). Land use change is also a major cause of declining biodiversity and the depletion of soil carbon, in particular in carbon-rich peat organic soils (IPCC, 2019[30]).

Reducing deforestation induced by agricultural expansion is critical to mitigate LULUCF emissions, particularly in tropical regions where agricultural production has expanded significantly into new areas. On the production side, increasing agricultural productivity and yields is key to reducing the need for additional land to meet food demand, as well as reducing (but not eliminating) trade-offs between increased food production and negative impacts on natural ecosystems (see Box 1.3). Productivity gains can also help offset emissions through carbon sequestration, by providing the opportunity to restore and reforest marginal lands. These measures can also be accompanied by demand side options to further reduce the demand for land, as highlighted further below.

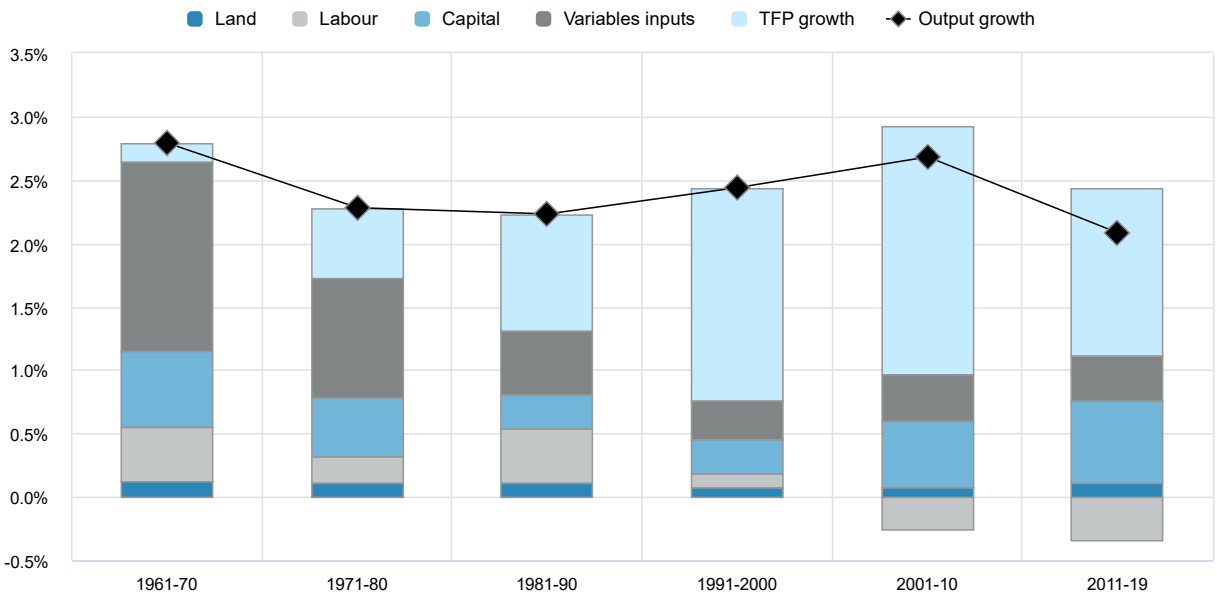
However, achieving forest protection requires additional policy interventions, such as the establishment of protected areas, effective law enforcement and forest governance, improvements in land tenure and sustainable management certification. Better forest protection is seen as a major source of emissions abatement, with the largest mitigation potential mostly located in deforestation hotspot regions, in Latin America, Africa and Southeast Asia. Agricultural activities can also lead to the conversion and degradation of other lands, such as grasslands and savannahs; however, the mitigation potential associated with protecting these lands is lower.

Among sensitive ecosystems, peatlands deserve particular attention due to the significant carbon stocks that they contain. Peatland drainage leads to large GHG emission releases through soil mineral carbon oxidation, which persist over time, and through peat fires. Globally, around 25 million hectares of drained peatlands (about 0.6% of agricultural land) are estimated to generate around 2% of total anthropogenic emissions (FAO, 2022[36]), and will continue to do so unless these are rewetted. This phenomenon is particularly acute in Southeast Asia, due to the expansion of palm and rubber plantations, which account for 80% of global peat emissions (Leifeld and Menichetti, 2018[37]; IPCC, 2022[5]). Halting and reversing peatland conversion is seen as an important emissions abatement action, at a relatively low cost (Henderson et al., 2022[7]).

Box 1.3. Total factor productivity growth contribution to climate change mitigation

Since the 1960s, the relationship between agricultural production growth and input use has evolved. Notwithstanding continued deforestation associated with expansion of agriculture in the tropics, the growing demand for food has progressively moved production away from increasing use of factors (land, labour, capital) and emission-intensive variable inputs (synthetic fertilisers, animal feed) thanks to total factor productivity (TFP) gains (Figure 1.7). TFP improvements have been the most important source of additional production since the 1990s, based on improved farm management practices, new crop varieties and breeds, and innovations related to digitisation.

Figure 1.7. Sources of growth in global agricultural output, 1961-2019



Note: Each bar represents the annual average growth rate over that period. Agricultural TFP growth is estimated as the residual between output growth and input growth. The aggregate input index is calculated according to the "cost decomposition" methodology, which multiplies the growth rate of each input by their respective factor shares, revealing the extent to which each input contributes to changes in unit costs of production (Fuglie, 2015[38]). Capital includes farm machinery and livestock inventories. Variable inputs include fertilisers and animal feed (all types, except forages and silage).
Source: (USDA, 2021[39]).

Improvements in TFP have greatly mitigated the upward trend in agricultural emissions by decreasing the emissions intensity of agricultural production (i.e. emissions per unit of output) through the more efficient use of agricultural inputs (higher output per hectare of cropland or pasture, per kg of fertiliser, per animal, per kg of animal feed, and per litre of fuel or kW of electricity). Direct emissions from agriculture grew by approximately 0.5% per year between 1990 and 2016, while crop production grew by an estimated 2.5% per year and livestock production grew by about 1.9% per year over the same period (OECD, 2021[40]). This has primarily been achieved through new production techniques implying substitution of labour by capital and more efficient use of inputs, such as fertilisers, animal feed and land.

TFP growth has also enabled a partial "decoupling" of food production growth and land use change, leading to a more than three-fold increase in agricultural production since 1960, while agricultural land use for crops and pasture grew by only 10-15% over the same period (OECD, 2021[40]). Although land use changes from agriculture are still a major concern, productivity growth has been indispensable in enabling agriculture to feed the world. For instance, in spite of increased fertiliser emissions, past land use intensification is estimated to have led to an overall saving of 590 $GtCO_2e$ between 1961 and 2005 through avoided conversion of natural land (Burney, Davis and Lobell, 2010[41]).

Continued improvements in agricultural TFP should therefore contribute to reductions in emissions intensity, both through decreases in the use of emission-intensive inputs and mitigation of land use change. However, it is critical that productivity improvements do not come at the expense of other sustainability dimensions. Productivity improvements do not necessarily lead to a reduction in all input use (substitution may occur) and land use intensification can impact biodiversity and water pollution. This underscores the importance of improving the measurement of TFP to take account of environmental externalities.

Additionally, while TFP growth reduces emissions intensity, this does not necessarily result in lower overall emissions. By lowering agricultural production costs and improving output (and food security), improvements in TFP can also trigger increased production and consumption, thereby offsetting part of the reduction in GHG emissions (Blandford and Hassapoyannes, 2018[26]). This phenomenon is known as the Jevons paradox, which describes the tendency of a resource exploitation to rebound, when its use benefits from an efficiency improvement. This paradox is particularly relevant in the case of large impacts at the margin of agricultural production, such as land use change emissions (Villoria, 2019[42]; Hertel, Ramankutty and Baldos, 2014[43]) or water resource impacts (Grafton et al., 2018[44]).

Notwithstanding these caveats, improving productivity remains fundamental to the mitigation intervention portfolio, in particular for crop and livestock emissions. That said, productivity improvements alone are insufficient and accompanying measures need to be in place to protect natural resources. A better understanding of the trade-offs and synergies in productivity and sustainability efforts is also needed, including through the development of indicators to take account of sustainability impacts in conjunction with TFP increases.

Agricultural soils are also an important reservoir of carbon, and the evolution of these stocks depends importantly on crop and livestock management practices. Crop rotations, residue management, tillage intensity, water management and irrigation practices, and biochar application all affect cropland carbon stocks. On grasslands, management of vegetation, cattle stocking density and grazing pressure, as well as fire management also determine the evolution of soil organic carbon. Although conservation practices involving reduced tillage have shown great efficacy in very dry environments, large uncertainty remains in wetter conditions, and soil carbon sequestration measurement and monitoring is key to ensure the potential from this sink is realised. Overall, the economic mitigation potential from soil carbon sequestration remains considerable, as it could offset 4% of total anthropogenic emissions (Henderson et al., 2022[7]).

Planting trees on agricultural land also appears to be a promising avenue for carbon sequestration. This can take the form of agricultural plantations (e.g. palm oil on existing agricultural land, orchards, dedicated bioenergy crops), agroforestry (combining trees and shrubs with annual crops or livestock), or simply afforestation of agricultural land. The most suitable options will depend on local and market conditions and policy incentives, but could deliver significant temporary or permanent carbon sequestration. However, an important caveat of afforestation on agricultural land is the indirect land use change effect, as agricultural production could be displaced to other areas, driving additional deforestation.

Reducing food losses

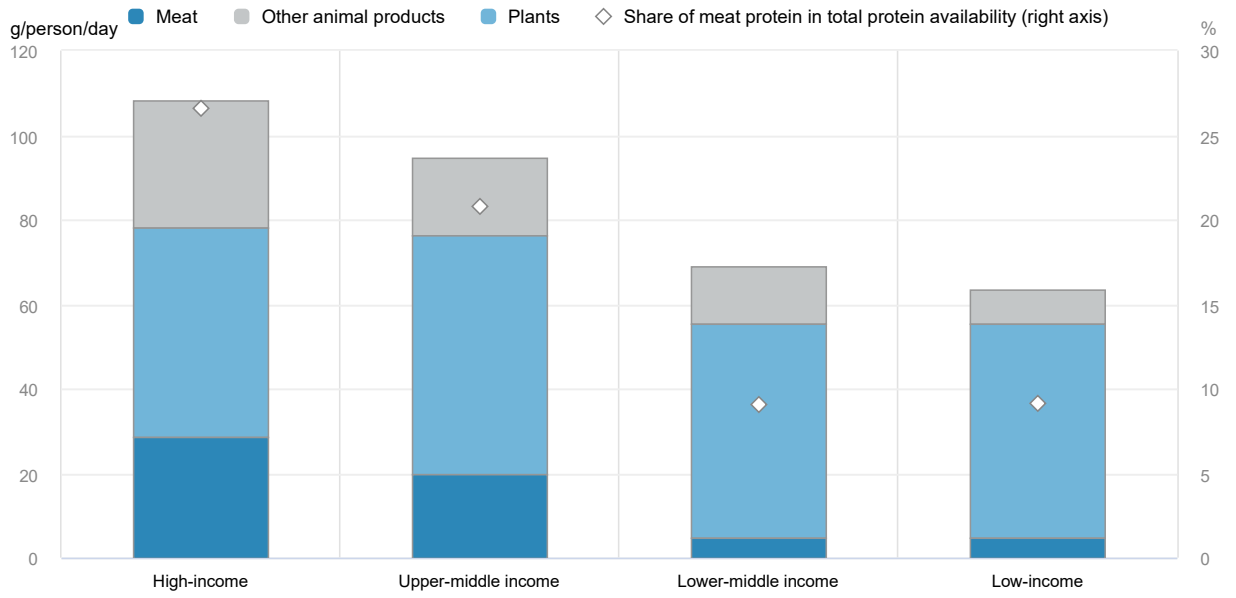
Reducing food losses should also provide a significant opportunity to limit emissions related to food production. Food losses occur at all stages of the supply chain, including production, harvesting, transport, storage and distribution. Losses that take place at retail and public or household consumption stage are rather classified as waste (see further below). According to FAO (2019[45]), 14% of food production is estimated to be lost along the supply chain, from post-harvest phase to distribution (but excluding retail). This generates substantial GHG emissions through the need for food production that is not consumed. At the harvest stage, losses can be reduced through better crop quality using agronomic techniques, better timing of harvests and improvements to harvesting equipment. Food losses can be further reduced at the post-harvest stage through better storage infrastructure, and optimisation of food processing facilities, in particular by more efficient transformation processes, improvements in the logistical chain and reduction of contamination. Packaging improvements should also help reducing losses from damages in the logistical chain, while reducing material consumption.

Demand side options: dietary changes and consumer waste reduction

Demand side options have gained increased attention, as the general public becomes more aware of the impact of consumption choices and behaviours on climate change. Two main mitigation opportunities can be identified on the demand side: changes in dietary patterns, and reduction of consumer waste.

The emissions abatement potential of shifting consumption away from food products with high emissions intensities (e.g. ruminant meat and dairy) and replacing them with less emissions-intensive sources of nutrition (such as plant-based or more efficient animal-based protein, see Figure 1.5) has been well-documented (Stehfest et al., 2009[46]; Popp, Lotze-Campen and Bodirsky, 2010[47]; Tilman and Clark, 2014[48]). Estimates of protein consumption levels in different parts of the world (Figure 1.8) reveal significant potential for reductions in animal-based protein in developed economies, while still remaining within the recommended dietary intakes for proteins. According to a broad literature review by the IPCC (2022[5]), changing diets globally has a feasible potential of 1-2.7 $GtCO_2eq$ for direct agricultural emissions, and up to 4 $GtCO_2eq$ when indirect emissions are also accounted for. For instance, when compared to a conventional (omnivorous) diet, a Mediterranean (less meat and more fruits and vegetables), pescatarian (no meat, more seafood proteins) or vegetarian (only plant based proteins) diet has been shown to deliver important GHG emissions savings globally, as well as substantial health co-benefits (Tilman and Clark, 2014[48]). Food consumption changes towards low emission diets need however to remain nutritionally adequate to be an acceptable option, which requires considering all macro- and micro-nutrients to ensure healthy nutrition (Willett et al., 2019[49]). The feasibility of such large dietary changes at global scale, satisfying both climate and health requirement, is debated. The IPCC indicates that shifting away from high emission intensity products should be feasible in many regions, but economic studies also highlighted the potentially higher cost for the consumer associated with a fully sustainable and healthy diet, in particular in low income regions (Hirvonen et al., 2020[50]).

Figure 1.8. Per capita protein availability, by country income group, 2018-20



Note: Meat includes beef and veal, pork, poultry and sheep meat; Other animal products include dairy products, fish and eggs; Plants include vegetable oil, pulses, roots and tubers and cereals (maize, wheat and rice). The recommended WHO dietary intake for protein is 0.83g/kg body weight per day i.e. 58 g/day for a 70 kg adult.
Source: (OECD/FAO, 2021[8]).

Beside climate change and nutritional benefits, dietary changes are also expected to deliver other sustainability benefits. For instance, pasture represents two-thirds of agricultural land globally, rising to 78% of farming land when feed crop requirements are included. The expansion of cattle systems is strongly tied to deforestation patterns and the loss of biodiverse ecosystems in Latin America. Overgrazing is also responsible for large carbon and biodiversity losses for grass-fed systems, while for more intensive ones, high stocking densities lead to nutrient surpluses that are important sources of water pollution. That said, reducing animal products in diets poses immense challenges for livelihoods and for rural development. Livestock represents an important part of agricultural value added in many developed economies, while in poorer regions, rural populations are often dependent on cattle rearing for their basic income and food security. Pasture land cannot always be converted to other agricultural use due to topographical and climate constraints, and animals can also be a source of organic fertilisers that would require substitutes. Transformations would therefore need to be context-specific, progressive and accompanied with appropriate reconversion programmes and social safety nets, as well as local development and landscape adaptation plans.

Besides dietary changes, reducing food waste represents an important potential mitigation option, with possible decreases in the amount of production needed without impacting food consumption (Table 1.1). Beyond behavioural changes driven by increased consumer awareness, possible interventions include regulation and taxation targeting retailers and large businesses; reporting and reduction targets; longer-lasting products; and incentives for consumers to purchase cosmetically imperfect products. Food waste reduction would also bring a number of environmental co-benefits related to lower production; but, again, would also have revenue implications for farmers.

Table 1.1. Waste in food consumption

	Average food waste (kg/capita/year)		Global food waste in 2019 (Mt)
	High income countries	World*	
Household	79	74	569
Food service	26	32	244
Retail	13	15	118
Total	118	121	931

Note: *World estimates are based on a sample covering 75% of the world population for "Household", 32% for "Food services" and 14% for "Retail".
Source: UNEP (2021[51]).

Box 1.4. Bioenergy from agricultural sources

Conventional bioenergy is not a supply-side option for mitigating agricultural emissions in a strict sense, as its main mitigation effect comes from the replacement of fossil fuels consumed in the rest of the economy. Because the absorption of CO_2 during plant growth offsets emissions subsequently generated through the combustion of the biomass, the convention is to not account for emissions resulting from their combustion. This assumption, called carbon neutrality, does not mean that biofuels completely offset fossil fuel emissions, because the cultivation, collection and transformation of feedstocks to produce these fuels is also a source of GHG emissions. The final levels of GHG savings associated with biofuels is determined by a life cycle assessment (LCA), comparing emissions from the biofuels supply chain with the emissions from fossil fuel alternatives along their production and combustion cycle (OECD, 2008[52]).

The largest source of bioenergy at present is solid biomass from forests used in energy power plants (modern biomass) and traditional use at home for cooking and heating through wood collection, common in developing countries (traditional biomass, considered unsustainable). In contrast, agricultural feedstocks are used mainly for the production of liquid biofuels and biogas, and their use has recently become more mainstream. The most common feedstocks for biofuels are sugar cane in Brazil and maize in the United States, both of which are converted into ethanol, as well as vegetable oils from palm and rapeseed that are used for biodiesel, for instance in Europe and Southeast Asia.

Feedstocks derived from crops that are used for biofuels, also called first-generation feedstocks, show relatively mixed performance in terms of GHG savings, and have made a limited contribution to overall mitigation to date (OECD, 2019[25]). More advanced feedstocks based on agricultural residues (sugar cane bagasse, cereal straw, corn stover, rice husk) are often considered more promising, but their availability remains limited, and, similar to first-generation feedstocks, may compete with alternative uses. These feedstocks can be used as solid biomass or transformed through more advanced processes to be used as liquid biofuels with much higher environmental benefits. Similarly, dedicated lignocellulosic crops can be grown to produce such fuels with higher efficiency, and with the possibility of growing on marginal land. Yet these so-called second-generation energy crops remain expensive to convert into fuels and their deployment currently remains limited in scale.

Biofuels may also be a direct mitigation option for the AFOLU sector. Biodigesters reduce non-CO_2 emissions from manure management and produce biogas that substitutes for fossil fuel energy sources. Dedicated energy crops can also sequester carbon in the soil through reduced tillage management, whereas palm tree and wood plantations increase carbon storage time in landscape vegetation. Bioenergy with carbon capture and sequestration (BECCS) involves reinjecting emissions from the

biofuel production process into geological reservoirs. Although considered as the most efficient route, this latter technology is not mature at the present time.

The overall environmental benefits of land-based biofuels depend not only on their local management, but also on their indirect effects on land use. The displacement of crops and animals to convert land to biofuels has been heavily debated as a possible source of additional GHG emissions that may occur in different regions of the world and the associated potential emissions are generally not considered in LCA. For this reason, some countries have considered additional safeguards or restrictions on their use (minimum emission saving thresholds, incorporation rate caps, or specific certification criteria). Due to the significant need for decarbonisation across the rest of the economy to achieve carbon neutrality, bioenergy will likely remain part of the mitigation options to which agriculture will need to contribute, in particular for sectors that currently have limited alternatives to reduce their emissions (e.g. international aviation), and where land use impacts can be contained.

Mitigation measure potentials

The potential contribution of the different measures above to climate change mitigation varies depending on their nature, the sources they are targeting and the regions where they are applied. The IPCC estimates that AFOLU as a whole has a technical potential of 28 $GtCO_2eq$ per year, bioenergy excluded, which is about half of annual anthropogenic emissions over 2010-2019. The economic potential would, however, be lower, with 8-14 $GtCO_2eq$ of reduction per year achievable at a cost less than USD 100 per tCO_2eq, 30-50% of which would be actionable for less than USD 20 per tCO_2eq. The detailed mitigation potentials per AFOLU action area are presented in Table 1.2 below, as identified by the IPCC, based on bottom-up sectoral assessments, and corresponding to the upper bound of the 8-14 $GtCO_2eq$ total feasible economic potential.[19] Supply side measures represent an economic mitigation potential of about 10 $GtCO_2$ per year, but only 0.6 $GtCO_2eq$ are estimated as being achievable through reductions of on-farm non-CO_2 emissions, representing only 10% of these agricultural sources, underscoring the importance of action in the LULUCF domain. Agricultural soils can in particular contribute 1.6 $GtCO_2eq$ per year according to IPCC, which is also consistent with the estimate from Henderson et al. (2022[7]).

Demand side measures are shown to have relatively high potential, at 4.2 $GtCO_2eq$ per year, and could reach much higher levels if land expansion emission savings, as well as other supply chain emissions, are also accounted for (up to 8 $GtCO_2eq$ per year).[20] The comparative cost-efficiencies of demand-side versus supply-side measures are subject to debate. The IPCC estimates an economically feasible potential of 2.2 Gt CO_2eq per year for demand side measures, but many of these options depend on consumer behavioural changes, which, while potentially requiring lower upfront investment, may be hard to introduce due to normative, cultural and institutional resistance. In terms of efficacy, both channels of action are seen as having significant mitigation potential for the same sources (OECD, 2019[25]), and there is a growing consensus on the need to use both in combination.

The current composition of food production, relying on a large share of land and crop production dedicated to animal products, is at the core of the climate mitigation challenge for agriculture. However, it is also important to recognise the heterogeneity of emission intensities on the supply side. Targeting emissions hotspots and addressing the most inefficient and emissions-intensive producers could drastically reduce GHG emissions without necessarily impacting consumption.[21]

Table 1.2. Global AFOLU abatement potentials relevant for agriculture, 2020-2050 time horizon

Average IPCC estimates (with reviewed range in parenthesis) – $GtCO_2eq$

	Abatement technical potentials	Abatement economic potentials (cost < USD 100 per tCO_2eq)
Supply side measures	21.3 (5.4 – 49.6)	10.0 (4.9 – 17.4)
Direct on farm emissions	1.7 (0.5 – 3.2)	0.6 (0.3 – 1.3)
Crops cultivation	0.3 (0.06 – 0.7)	0.2 (0.05 – 0.6)
Rice cultivation	0.3 (0.1 – 0.8)	0.2 (0.05 – 0.3)
Enteric fermentation	0.8 (0.2 – 1.2)	0.2 (0.1 – 0.3)
Manure management	0.3 (0.1 – 0.5)	0.1 (0.09 – 0.1)
Land use and agricultural soils*	19.6 (4.9 – 46.4)	9.4 (4.6 – 16.1)
Deforestation	4.5 (2.3 – 7.0)	3.4 (2.3 – 6.4)
Afforestation and reforestation	3.9 (0.5 – 10.1)	1.6 (0.5 – 3.0)
Other LUC conversion	0.2 (0.1 – 0.4)	0.04 (0.0 – 0.1)
Peatlands protection and restoration	1.6 (0.9 – 3.3)	0.9 (0.4 – 1.3)
Soil organic carbon		
Cropland	1.9 (0.4 – 6.8)	0.6 (0.4 – 0.9)
Grassland	1.0 (0.2 – 2.6)	0.9 (0.3 – 1.6)
Biochar	2.6 (0.2 – 6.6)	1.1 (0.3 – 1.8)
Agroforestry	4.1 (0.3 – 9.4)	0.8 (0.4 – 1.1)
Other AFOLU non relevant for agriculture	*2.9 (1.2 – 8.4)*	*1.4 (0.7 – 2.4)*
Demand side measures**	4.2 (2.2 - 7.1)	2.2 (1.1– 3.6)
Diet change***	N/A	1.7 (1.0 – 2.7)
Food waste and losses***	N/A	0.5 (0.0 – 0.9)
TOTAL AFOLU (agriculture related)*	25.5 (7.6 – 56.7)	12.2 (6.0 – 21.0)

Note: Land use categories relevant for agriculture indicate the full mitigation potential of the category, even if only a part of it can be achievable through the agricultural sector (e.g. afforestation). All estimates are based on sectoral assessment data and reflect averages. Uncertainty ranges are documented in IPCC (2022[5]).

* Total excluding "Other AFOLU non relevant for agriculture", featured for completeness. The following categories are not accounted: forest management, fire management, coastal wetlands protection and restoration. ** IPCC only provides a total estimate for technical potential of demand side measures. The split between dietary change and food waste is however available for economically feasible potentials. *** Estimates corresponding to avoided agricultural production emissions (land use change excluded to limit double-counting).

Source: (IPCC, 2022[5])

What are countries doing to mitigate agricultural emissions?

Considering the role that AFOLU has to play to meet the 2015 Paris Agreement's objectives, ambitious policy action on agriculture is needed to ensure that countries take advantage of the opportunities available for mitigation. This section provides an overview of the targets set by countries and the policies introduced to mitigate agricultural emissions. While the coverage is not exhaustive, it aims to shed light on the main policies and instruments relating to mitigation in agriculture.

Setting mitigation targets for agriculture

All of the 54 countries covered in this report have submitted Nationally Determined Contributions (NDCs) under the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). However, national ambitions and commitments to mitigate emissions vary considerably across countries (Table 1.3). While most of the countries covered in this report have set intermediate targets for 2030 and net zero targets for 2050 (or in some cases, 2060 or 2070), not all countries have established these as binding targets within their legislation. Out of the 54 countries covered in this report, 36 countries (plus the European Union as a whole) have communicated their long-term strategies to the UNFCCC.

Although agricultural emissions are included in most countries' NDCs, only 16 out of the 54 countries have set specific emissions reduction targets for their agricultural sectors. Where agricultural targets have been defined by countries, they are typically lower than the reductions needed to stabilise global temperatures at 2°C (Henderson, Frezal and Flynn, 2020[53]).

Table 1.3. Economy-wide and agriculture-specific GHG mitigation targets

	Economy-wide emissions reduction targets		Long-term strategy submitted to UNFCCC	Agriculture-specific target (base year/level)	Global methane pledge (reduce global CH_4 -30% from 2020 levels by 2030)
	2030 target (base year/level)	2050 target			
Argentina	Max 359 $MtCO_2eq$	None	No	None	Yes
Australia	-26-28% (2005)	Net zero	Yes	None	No
Brazil	-50% (2005)	Net zero	No	None	Yes
Canada	-40-45% (2005)	Net zero	Yes	-30% fertiliser emissions by 2030 (2020)	Yes
Chile	Max 95 $MtCO_2eq$	Net zero	Yes	None	Yes
China	Peak CO_2 ; -65% GDP emission intensity (2005)	Net zero by 2060	Yes	None	No
Colombia	-51% (BAU)	Net zero	Yes	None	Yes
Costa Rica	Max 9.11 $MtCO_2eq$	Net zero	Yes	None	Yes
European Union	-55% (1990)	Net zero	Yes	None at EU level	Yes
EU Member States			18 out of 27 countries (except BGR, CYP, EST, GRC, HRV, IRL, ITA, POL, ROU)	2030 targets: BEL -25% (2005); DNK -55% (1990); DEU -31-34% (1990); FRA -18% (2015); IRL -22-30% (2018) PRT -11% (2005)	19 out of 27 countries (except AUT, CZE, HUN, LVA, LTU, POL, ROU, SVK)
Iceland	-55% (1990)	"Largely neutral" by 2040	Yes	None	Yes
India	-45% GDP emission intensity (2005)	Net zero by 2070	No	None	No
Indonesia	-29% from BAU; up to -41% conditional on int. support	Net zero by 2060	Yes	None	Yes
Israel	-27% (2015)	-85% from 2015 levels	No	None	Yes
Japan	-46% (2013)	Net zero	Yes	49.5 $MtCO_2eq$ by 2030	Yes
Kazakhstan	-15% (1990)	None	No	None	No
Korea	-40% (2018)	Net zero	Yes	-27.1% by 2030; -37.7% by 2050 (2018)	Yes
Mexico	-22% (BAU); up to -36% conditional on int. support	None	Yes	-8% by 2030 (BAU)	Yes
New Zealand	-50% (2005)	Net zero except methane	Yes	-24-47% reduction in biogenic methane by 2050	Yes
Norway	-50-55% (1990)	-90-95% (1990)	Yes	Voluntary agreement with agriculture sector: -5 $MtCO_2eq$ by 2030	Yes
Philippines	-2.7% (2020); up to -75% conditional on int. support	None	No	-29.4% by 2030 (BAU) conditional on int. support	Yes
Russia	-30% (1990)	Net zero by 2060	No	None	No
South Africa	350-420 $MtCO_2eq$	None	Yes	None	No

	Economy-wide emissions reduction targets		Long-term strategy submitted to UNFCCC	Agriculture-specific target (base year/level)	Global methane pledge (reduce global CH_4 -30% from 2020 levels by 2030)
	2030 target (base year/level)	2050 target			
	(BAU 398-614 $MtCO_2eq$)				
Switzerland	-50% (1990)	Net zero	Yes	-40% by 2050 (1990)	Yes
Turkey	-21% (BAU)	Net zero by 2053	No	None	No
Ukraine	-65% (1990)	Net zero by 2060	Yes	None	Yes
United Kingdom	-68% (1990)	Net zero	Yes	-17-30% by 2030 ; -24-40% by 2035 (2019)	Yes
United States	-50-52% (2005)	Net zero	Yes	None	Yes
Viet Nam	-9% (BAU); up to -27% conditional on int. support	Net zero	No	-20% every 10 years	Yes

Some countries have set targets to reduce specific GHGs, such as methane or nitrous oxide emissions. Under the Zero Carbon Amendment Act 2019, **New Zealand** has set separate long-term emission reductions targets for long-lived and short-lived GHG emissions. This includes a specific objective for methane, targeting a reduction in biogenic methane emissions of 10% by 2030 and 24-47% by 2050 (relative to 2017 levels). **Canada** set a national target to reduce emissions from fertilisers by 30% from 2020 levels by 2030, and will work with fertiliser manufacturers, farmers, provinces and territories to develop an approach to meet the target. **China's** first NDC submitted in 2016 included a target for achieving zero growth in fertiliser and pesticide utilisation by 2020, which the government reported as achieved in 2018, as well as broad objectives to control methane emissions from rice fields and nitrous oxide emissions from farmland. **Korea** set a target of reducing methane emissions by 30% by 2030 (relative to 2018 levels), and 20.6% in the agricultural sector.

Policy levers to mitigate agricultural emissions

Governments have a range of policy instruments at their disposal to mitigate agricultural emissions. These can be divided into four broad categories: emissions pricing instruments; agricultural support, grants and preferential credits; environmental regulations; and R&D and knowledge transfer.

Research shows that these policy approaches perform quite differently with respect to their effectiveness in reducing emissions, cost effectiveness, and impacts on producers, consumers and government budgets (OECD, 2019[25]). Emissions pricing instruments based on the "polluter pays principle", by either taxing emissions or establishing tradeable permits, are the most effective at reducing emissions for a given carbon price because they provide incentives to adopt low emission measures, switch from higher to lower-emission commodities, and scale back overall production and emissions. These policies also raise revenue for governments. On the other hand, they also impose costs on producers, particularly farmers producing emission-intensive commodities, and consumers, and these welfare impacts need to be managed. Regulations restricting specific high emission practices can also impose costs on producers and consumers, but they lack the efficiency and cost effectiveness of policies based on the "polluter pays principle" (Baumol and Oates, 1988[54]).

Policies based on the "beneficiary pays principle" that subsidise emission reductions can provide an alternative market-based approach, and one which does not impose costs on producers or raise food prices. However, these policies require careful design to ensure that producers are not over-compensated, they tend to be less effective, and they can impose large costs on governments and other sectors purchasing emission reductions (if implemented on a large scale). The use of grants to support the adoption of low emission practices, either directly or via cross-compliance requirements, shares some similarities with abatement subsidies. However, since grants do not use competitive market-based

approaches to disburse funds and typically do not have stringent emission measurement requirements, they do not set an explicit carbon price and are less efficient than abatement subsidies (OECD, 2019[25]).

Other supply-side mitigation policy approaches such as R&D and knowledge transfer, and preferential credit schemes are particularly relevant for stimulating the adoption of profitable mitigation measures that are un- or under-utilised due to knowledge and financing barriers. They can also provide an enhanced enabling environment to improve the performance of other mitigation policies and, in the case of R&D and knowledge transfer, they can stimulate innovation and competitiveness over the longer term and help drive down emissions without imposing costs on producers and consumers (OECD, 2019[25]). Investment in accurate and affordable measurement, reporting and verification (MRV) procedures and technologies is also critical, particularly for enabling the efficient functioning of emission pricing policies.

Table 1.4 presents specific policy instruments corresponding to these categories and some selected examples of countries that have applied these instruments.

Table 1.4. Policy levers to mitigate agricultural emissions

Policy category	Specific instrument	Examples
Emissions pricing instruments	Emissions taxes	
	Emissions trading schemes / carbon offsets	New Zealand (NZ ETS)
	Abatement subsidies / auctions	Australia (Emissions Reduction Fund)
Agricultural support, grants and preferential credits	Agricultural support	EU (CAP); Canada; other countries
	Grants	United States (biogas); China; Australia
	Dedicated credit line	Brazil (ABC programme)
Environmental regulations	Pollution regulations	EU (Nitrates directive and pollution control)
R&D and knowledge transfer	R&D	Global Research Alliance
	Knowledge transfer	Multiple countries

Source: (Henderson, Frezal and Flynn, 2020[53]).

Emissions pricing instruments

Emissions pricing instruments aim to influence incentives for production and consumption. Mechanisms that put a price on emissions include carbon pricing through emissions taxes and emissions trading schemes, carbon offsets, and some abatement subsidies (e.g. those that are delivered via auctions). There are relatively few examples of countries that have introduced emissions pricing to mitigate agricultural emissions.

Australia's Emissions Reduction Fund (ERF) was established in 2015 and is a voluntary scheme providing incentives for businesses to undertake emissions reductions and carbon sequestration projects that meet strict integrity requirements, including in relation to additionality. For agriculture, landowners and farmers can earn income by generating Australian Carbon Credit Units (ACCUs) for every tonne of emissions reduced or carbon stored through a project, and selling these to the government or to third parties. As of April 2022, the ERF had committed AUD 2.7 billion (USD 2 billion) through 14 auctions for a total of 217 $MtCO_2eq$ of abatement, including 15.2 $MtCO_2eq$ of agricultural emissions (of which just 1.1 $MtCO_2eq$ of abatement has been delivered so far). **Japan** introduced the J-Credit scheme in 2013, providing certified carbon credits for emissions reductions and carbon sequestration activities such as introduction of energy-saving technologies and forest management. As of January 2022, 107 projects were registered in the agriculture, forestry and fisheries sectors, with expected emission reductions or avoidance totalling 1.5 $MtCO_2eq$.

Ultimately, the scale of such voluntary market-based approaches is limited by the availability of funding from the government and private sector to pay producers for emissions reductions (Henderson, Frezal and Flynn, 2020[53]). Combining emissions abatement with other environmental services offers one possibility for farmers to increase and diversify their sources of funding. **Australia** recently launched the Carbon + Biodiversity Pilot, trialling a market-based approach to pay farmers for long-term biodiversity improvements, on top of income they can earn from the ERF for carbon sequestration projects. Landholders are required to plant, manage and maintain their carbon plantings in line with biodiversity protocols developed by the Australian National University.

Emissions pricing instruments that apply the "polluter pays" principle are not subject to these constraints. **New Zealand** has developed an Emissions Trading Scheme, which covers all sectors of the economy, although it does not currently cover methane and nitrous oxide emissions from agricultural production. Forestry emissions are included in the scheme, increasing the incentives for farmers and landowners to reduce deforestation and store carbon by converting pastureland to forests. Companies in the agricultural supply chain (e.g. meat processors, dairy processors, nitrogen fertiliser manufacturers and importers) are required to report on their agricultural emissions, but are not required to pay for their emissions. The New Zealand ETS also imposes a cost on emissions from transport fuels, electricity production, synthetic GHGs, waste and industrial processes, including in the primary sectors. Options for pricing agricultural emissions are currently under discussion.

Agricultural emissions tend to be excluded from most other economy-wide carbon pricing schemes, and are often dealt with through other mechanisms. The **EU** emissions trading scheme (EU-ETS) provides a framework for emissions reductions in the power, manufacturing and aviation industries, but does not include agricultural emissions, which are subject to annual mitigation targets under the EU's Effort Sharing Decision (for non-CO_2 emissions from agriculture) and the LULUCF Decision (for CO_2 emissions from land use change). The **Korean** Emissions Trading Scheme (KETS) was introduced in 2015, and imposes emission reduction obligations on companies that exceed a defined GHG emissions threshold. While agriculture is not currently included in the KETS, the Korean Ministry of Agriculture, Food and Rural Affairs operates voluntary emission reduction and offset projects to reduce emissions in the agricultural sector, and subsidises the cost of verification. Farmers can obtain certified offset credits for emission reduction projects and sell these in the emissions trading market. Several regional and state-level emissions trading schemes are in place or in the process of being set up in the **United States,** including in California, Washington, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont and Virginia. While agriculture is not required to reduce GHG emissions under these programmes, it is a permitted source of offsets in all of them.

Several countries have introduced taxes on emissions, but these also exclude the agricultural sector. **Canada's** carbon pollution pricing system, in place in every jurisdiction since 2019, largely excludes the agricultural sector. **Indonesia** has established legislation to introduce a carbon tax, due to be implemented in July 2022. The carbon tax is initially limited to coal fired power plants, and will provide the basis for the development of a broader carbon tax mechanism and a carbon exchange where companies can trade their emissions permits by 2025. **Norway's** agricultural sector is largely exempt from the country's carbon tax, with the exception of emissions from fossil fuel use in agriculture. **South Africa** introduced a national carbon tax under the 2017 Carbon Tax Act, however primary agriculture is exempted from the current Phase 1.

Grants, income support and credit programmes

Subsidised loans are sometimes used as a tool to encourage emissions reductions in agriculture. **Brazil's** Low Carbon Agricultural Programme or GHG Emission Reduction Program (ABC programme) was launched in 2010, and provides resources and incentives to farmers for adopting sustainable agricultural practices and technologies. The ABC programme provides low-interest loans to farmers for activities that

reduce emissions, such as recovering fragile areas and pastureland, expanding integrated crop-livestock-forestry systems and no-till farming, adopting forest conservation practices, improving unproductive and degraded soils, forest planting, organic agriculture, bio-inputs and bio-fertilisers and renewable energy generation for agriculture. The programme reduced an estimated 166 $MtCO_2eq$ of emissions over the period from 2010 to 2019. The **United States** has introduced initiatives providing preferential credit and grants to promote the adoption of GHG mitigation practices. For example, the Rural Energy for America Program (REAP) provides guaranteed loan financing and grant funding to agricultural producers for the adoption of renewable energy systems and energy efficiency improvements. The AgSTAR: Biogas Recovery in the Agriculture Sector programme helps producers to find information and financing for biogas recovery systems to reduce methane emissions from livestock waste.

Several countries have provided funding for initiatives that promote afforestation and soil carbon sequestration. **Canada's** Natural Climate Solutions Fund has made more than USD 2 billion available over ten years to plant two billion trees, USD 48 million over two years to protect existing wetlands and trees on farms, and USD 470 million for projects that conserve, restore and enhance wetlands, peatlands and grasslands. **China's** Grain for Green programme was introduced in 2000 and provides direct payments to farmers to re-establish forest and shrub vegetation on sloped cultivated land at risk of erosion, and to afforest large tracts of barren land. The programme is estimated to have achieved 29 million hectares of afforestation, including converting 9 million hectares of cropland to forestland. **India's** Ministry of Environment, Forest and Climate Change has been conducting the National Afforestation Programme since 2000, targeting community-based activities such as agro-forestry, improved soil conservation and restoration of degraded forests. **Ireland's** Afforestation Scheme was established in 2014 and provides grants and financial support to encourage the establishment and maintenance of new forests and woodlands.

Ukraine introduced the Green Country large-scale afforestation of Ukraine initiative, which aims to plant one billion trees over the next three years, and increase forested areas by one million hectares over the next ten years. The **United Kingdom** has introduced several new environmental land management schemes that contribute to the mitigation of emissions through tree planting and peatland management and restoration. These include **England's** Farming in Protected Landscapes Scheme, **Scotland's** Forestry Grant Scheme, and **Wales'** Forests for Our Future Programme. The **United States** set up the temporary Pandemic Cover Crop Program (PCCP), which encourages the adoption of cover crops by providing reduced crop insurance premiums for producers who plant a qualifying cover crop during the 2021 or 2022 crop years.

India has several programmes in place to reduce emissions from rice production, including systems of rice intensification under the National Food Security Mission (currently being implemented in 24 states), providing farm equipment to enable timely sowing in standing paddy residues, and Custom Hiring Centres and Farm Machinery Banks to enable sowing of wheat crops without the burning of paddy residues. **Japan** provides farmers with direct payments for mitigation activities, such as applying compost, extending the period of mid-season drainage in paddy rice fields, and reducing the use of synthetic fertilisers. Area-based payments are provided to dairy farmers for implementing environmentally friendly practices such as no-till farming in conjunction with reducing the use of synthetic fertilisers and pesticides. Investment support is provided to farmers for introducing renewable energy, biogas plants and composting facilities for better manure management and clean energy production, and biomass-based greenhouse heating systems in horticulture. Since 2014, **Switzerland** has provided resource efficiency contributions to farmers to support the use of environmentally friendly techniques such as conservation tillage systems (no-till, strip-till and mulch tillage), emission-reducing application methods for farmyard manure, and nitrogen-reduced phase feeding of pigs.

Environmental regulations

Regulatory policy instruments to reduce diffuse pollution from agricultural inputs such as fertilisers and manure can also have a strong influence on agricultural GHG emissions. The **EU** Nitrates Directive was established in 1991 and aims to prevent nitrate pollution of surface water and groundwater resources by promoting the use of good farming practices. While nitrate is not a GHG, by restricting nitrogen inputs into the agricultural system the directive also helps to mitigate important sources of nitrous oxide emissions. This includes establishing limitations on the application of nitrogen fertilisers and livestock manure on land, restricting livestock stocking rates, setting minimum storage requirements for livestock manure, and establishing crop rotations, soil winter cover and catch crops to prevent nitrate leaching and runoff. **Norway** has established regulations for manure and fertiliser management to control emissions from these sources, and restricted the cultivation of peat bogs to prevent additional emissions from organic soils. As of 2025, agricultural buildings will be prohibited from using fossil fuels for heating (this ban is in effect for other building types as of 2020). **Switzerland's** water quality plan adopted in 2022 introduces a minimum reduction target of 20% for nitrogen and phosphorus fertiliser losses by 2030. More stringent environmental cross-compliance requirements relating to manure application will further increase farmers' incentives to reduce their use of fertilisers.

EU cross-compliance rules can also support efforts to mitigate agricultural emissions by requiring farmers to respect EU rules on public, animal and plant health, animal welfare and the environment. In addition, farmers receiving CAP support are required to respect EU standards on good agricultural and environmental condition of land, including standards to prevent soil erosion, maintain soil organic matter and soil structure, maintain permanent grassland, protect biodiversity and protect and manage water. In **Kazakhstan**, some interest rate subsidies provided to livestock producers come with an obligation to rehabilitate their pasture lands, which could potentially help to lower agricultural emissions. **Korea** introduced a direct payment system with enhanced environmental cross-compliance requirements and increased green coverage through expanded urban farming. The **United States** also ties eligibility for federal farm programmes and subsidies to conservation practices.

Deforestation is an important driver of agricultural emissions in many countries. In **Argentina**, the 2007 National Law of Native Forests, the 2015 National Forest Management Plan with Integrated Livestock (MBGI) and the Law for the Promotion of Forests are efforts to ensure good practices and curb deforestation. **Brazil's** Forestry Code contains regulations to constrain land use change, and makes access to subsidised credit conditional on compliance with environmental regulations.

Regulations to promote biofuels can to some extent contribute to reductions in emissions from fossil fuels. For example, **Canada's** Clean Fuel Standard (CFS) will support the domestic production of biofuels by requiring liquid fuel suppliers to gradually reduce the carbon intensity of their fuels over time. The CFS will establish a regulated market for carbon credits, allowing ethanol and bio-diesel producers to earn credits for supplying low carbon intensity biofuels. It is complemented by the government's recent USD 1.1 billion investment in the Low-carbon and Zero-emissions Fuels Fund, which will support the domestic production of feedstocks for biofuels.

R&D and knowledge transfer programmes

Many of the countries covered in this report provide funding for R&D and knowledge transfer programmes to support the mitigation of agricultural GHG emissions. **Australia's** Long-Term Emissions Reduction Plan sets out the government's plan to achieve net zero emissions by 2050. It includes the Technology Investment Roadmap, which aims to accelerate the development and commercialisation of new and emerging low emissions technologies, including in the agricultural sector. **Canada's** 2030 Emissions Reduction Plan provides USD 366 million for the On-Farm Climate Action Fund to help farmers adopt climate friendly practices such as nitrogen management, cover cropping and rotational grazing, and USD 234 million for the Agricultural Clean Technology Programme to support R&D, commercialisation and

the adoption of new clean technologies for the agricultural sector. In addition, USD 78 million is provided for Transformative Science and USD 117 million is allocated for a resilient Agricultural Landscape Programme. **Chile's** Long-Term Climate Strategy was launched at COP26 in November 2021, and contains several objectives relating to the promotion of R&D and extension services to reduce agricultural emissions. Under the Agricultural Technology Development and Application Plan to Achieve Carbon Neutrality by 2050, **Korea's** Rural Development Administration is working to expand the development of low-carbon technologies for agriculture such as alternate wetting and drying for rice cultivation and recycling of livestock manure, increase the use of renewable energy and energy-efficient technologies, and enhance the carbon sequestration capacity of soils. The **United States** Department of Agriculture's Climate Hubs develop science-based information and technologies, and deliver them in co-operation with USDA agencies and partners to support the implementation of climate-smart practices. State-level extension services also provide outreach, training, technical assistance and on-farm testing of climate mitigation practices.

A number of countries have established research initiatives to tackle livestock emissions. **Australia** is providing USD 23.1 million in funding over six years for the Methane Emissions Reduction in Livestock (MERiL) grants programme. MERiL supports trials, development and commercialisation of new livestock feed technologies and low-emission feed supplement delivery technologies to reduce enteric methane emissions from cattle and sheep. **China** launched several collaborative research projects with academia and the private sector in 2018, to identify novel feed solutions and estimate emission reductions from more sustainable dairy farming practices. **Colombia** is currently implementing several projects on sustainable livestock production and has established the Roundtable on Sustainable Livestock, an inter-agency public-private body for technical consultations. **Costa Rica** trained 200 extension service providers to formulate diets for animal feed, monitor livestock farms, and implement mitigation actions such as rotational grazing and silvopasture systems. **New Zealand's** He Waka Eke Noa – Primary Sector Climate Action Partnership provides extension and advisory services for farmers to measure and manage their emissions, and R&D investments in mitigation technologies such as methane inhibitors and a methane vaccine. The New Zealand Government also researches mitigation technologies for ruminant livestock through the New Zealand Agricultural Greenhouse Gas Research Centre, the Pastoral Greenhouse Gas Research Consortium, and in co-ordination with the member countries of the Global Research Alliance on Agricultural Greenhouse Gases.

Several countries are supporting the development of climate-smart agriculture. **Iceland** is implementing the Climate-Friendly Agriculture project, which provides comprehensive advice and education to farmers with the aim of reducing GHG emissions from agriculture and land use. The project is a part of the 2020 Climate Action Plan, which also includes actions to reduce the use of mineral fertilisers, improve livestock feeding to reduce enteric fermentation, increase domestic vegetable production, and achieve carbon neutrality in cattle breeding. **India** has increased funding for R&D in technologies to convert agricultural stubble into biogas or other energy products. The **Indonesian** Agency of Agriculture Research and Development has established a number of R&D and extension programmes focusing on climate-smart practices and technologies, including the development of plant varieties resistant to climate stress, a planting calendar adjustment system, and efficient agricultural equipment and machinery.

Israel has introduced several programmes to strengthen conservation and regenerative agricultural practices (e.g. minimum tillage, cover crops, applying organic matter to soils), reduce the use of natural and synthetic fertilisers, improve the treatment of organic agricultural waste, develop know-how for climate-smart agriculture, protect trees and forests to sequester carbon, and facilitate the role of farming in renewable energy production. **Mexico's** agricultural sector strategy promotes agricultural practices adapted to climatic and environmental conditions, such as soil conservation and reduced burning of residues, considering community and scientific knowledge; and adopting agroforestry, agroecology and biodigesters on livestock farms. **The Philippines** is promoting new technologies and practices to reduce emissions, such as Alternate Wetting and Drying for irrigated rice cultivation, microbial inoculants, biochar,

livestock feed supplements and nature-based solutions. **Ukraine** has introduced minimum-tillage techniques and a ban on stubble burning in fields, improved agricultural practices in zones vulnerable to nitrate pollution, increased support for restoring degraded land, and is supporting the use of manure in biogas production.

Building the capacity for measurement, reporting and verification (MRV) of farm-level emissions can help to pave the way for the introduction of carbon pricing policies. **Australia** launched the three-year USD 38.1 million National Soil Carbon Innovation Challenge to identify and fast-track low-cost, accurate technological solutions for measuring soil carbon at below USD 2.25 per hectare per year on average. The five-year USD 5.9 million Soil Carbon Data Programme is working to improve soil carbon data, build confidence in low-cost alternatives for measuring and estimating soil carbon, and contribute to a national soil data repository. **Viet Nam's** Ministry of Agriculture and Rural Development is also establishing MRV systems for agriculture and LULUCF under its Plan to Implement the Paris Agreement on Climate Change for 2021-30.

International policy initiatives

The *Global Research Alliance on Agricultural Greenhouse Gases* was launched in 2009, and includes 65 member countries that work together to increase co-operation and investment in R&D to reduce the emissions intensity of agricultural production and increase the potential for soil carbon sequestration. The *Coalition on Sustainable Productivity Growth for Food Security and Resource Conservation* aims to accelerate the transition to more sustainable food systems through sustainable agricultural productivity growth. It was launched at the 2021 UN Food Systems Summit and is supported by 46 countries (including the European Union), as well as a broad range of academic and research organisations, private sector associations, and industry bodies.

Several international initiatives were launched at COP26 in Glasgow in November 2021, including:

- The *Global Methane Pledge*, signed by over 100 countries including 29 OECD members and the European Union as a whole. Countries joining the Pledge agreed to take voluntary actions to reduce global methane emissions by at least 30% from 2020 levels by 2030, potentially eliminating over 0.2°C of warming by 2050. While the target is global and any reductions in national methane emissions are made on a voluntary basis, participation sends a strong signal of a country's willingness to substantially reduce its methane emissions by 2030.
- The *Glasgow Leaders' Declaration on Forests and Land Use* was signed by 141 countries, and calls for efforts to halt and reverse forest loss and land degradation by 2030 through efforts to conserve and restore forests and other terrestrial ecosystems and accelerate their restoration.
- The *Agriculture Innovation Mission for Climate (AIM for Climate)* was launched at COP26 with 31 countries and over 48 non-government partners, and aims to significantly increase investment in agricultural innovation for climate-smart agriculture and food systems over the next five years. The initiative will also support technical discussions and promote expertise across international and national levels of innovation, and will facilitate co-operation on climate-related agricultural innovation on shared research priorities.
- The *Policy Action Agenda for Transition to Sustainable Food and Agriculture* sets out pathways and actions that countries can take to repurpose public policies and support to food and agriculture, to deliver these outcomes and enable a just rural transition.

Impacts of current agricultural support on climate change

Agricultural support policies have significant consequences for climate change and environmental sustainability. Governments across the 54 countries covered in this report provided USD 817 billion per

year in transfers to agriculture in 2019-21, of which USD 611 billion per year was provided as positive support to individual producers. The remainder was almost equally split between support for general services (USD 106 billion) and budgetary transfers to consumers (USD 100 billion). Some emerging economies also implicitly taxed their producers by an average of USD 117 billion per year.

Support policies can influence GHG emissions and environmental outcomes in different directions depending on their design. By changing agricultural market prices, they can influence farmers' decisions to produce and the emissions generated through changes in production volume. If they target input or factor prices, they can also affect the way in which farmers produce, by encouraging substitution between intermediate inputs and primary production factors (e.g. land, capital and labour), affecting the emissions intensity of production, either on the farm or through changes in land use (Henderson and Lankoski, 2019[55]). Due to these effects, support policies, whether provided in the form of market transfers or budgetary payments, can work against other policy interventions for climate change mitigation.[22] Support policies can also be targeted to incentivise environmentally beneficial practices, or can provide for broader general services with potential to support emissions reductions, such as support for R&D and innovation.

Against this background, this section discusses the impacts of current support policies on GHG emissions reduction incentives and efforts.

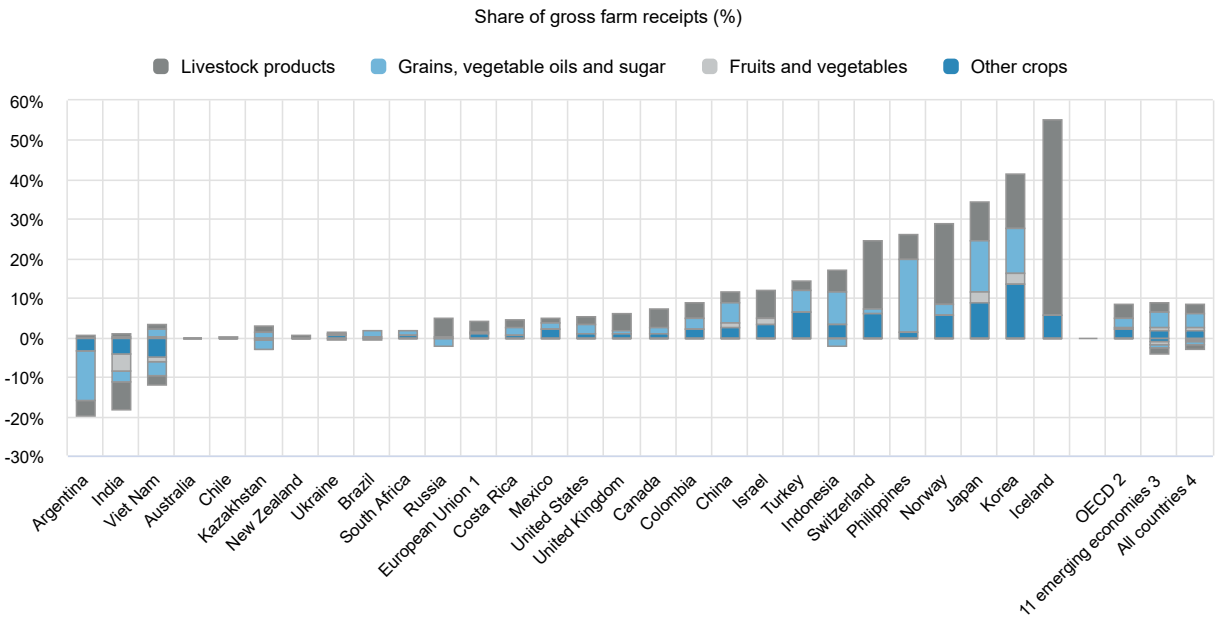
Emissions impacts of production support policies

Direct agricultural support for the production of specific commodities

Agricultural support policies are often aimed at facilitating the production of specific commodities. For example, market price support (MPS) corresponds to policies that create a price gap between domestic market prices and border prices for specific agricultural commodities. Import licences, tariffs, tariff rate quotas and minimum prices are examples of measures that result in higher prices paid by consumers. MPS increases the price received by the producer, thus providing incentives for additional production, the intensification of input use, the allocation of land to supported crops, and the entry of land to the agricultural sector. Other types of direct production support include coupled payments, whether they are based on output, current cultivation area, or number of animals. These also typically encourage farmers to increase their production, either through intensification, expansion of land, or the retention of farms that would be financially unviable without support. On the consumer side, however, the impacts of these interventions differ: MPS increases market prices, which (all else equal) will result in reduced domestic consumption. On the other hand, coupled payments decrease market prices, which ultimately supports and stimulates domestic consumption.

Direct support to the production of specific agricultural products is monitored in the context of this report by the single commodity transfer (SCT) indicator, which takes into account both MPS and coupled payments to single products. On average across all 54 countries covered in this report, SCTs accounted for half of the support provided directly to producers, or USD 247 billion in 2019-21 (USD 362 billion in positive transfers and USD 115 billion in implicit taxation). Support for livestock products, which tend to have high GHG emissions intensities, amounted to USD 111 billion, or 31% of total positive SCTs (Figure 1.9). Transfers to livestock products represent more than 60% of positive SCTs in Iceland, the United Kingdom, Norway, Switzerland, Canada, and the European Union.

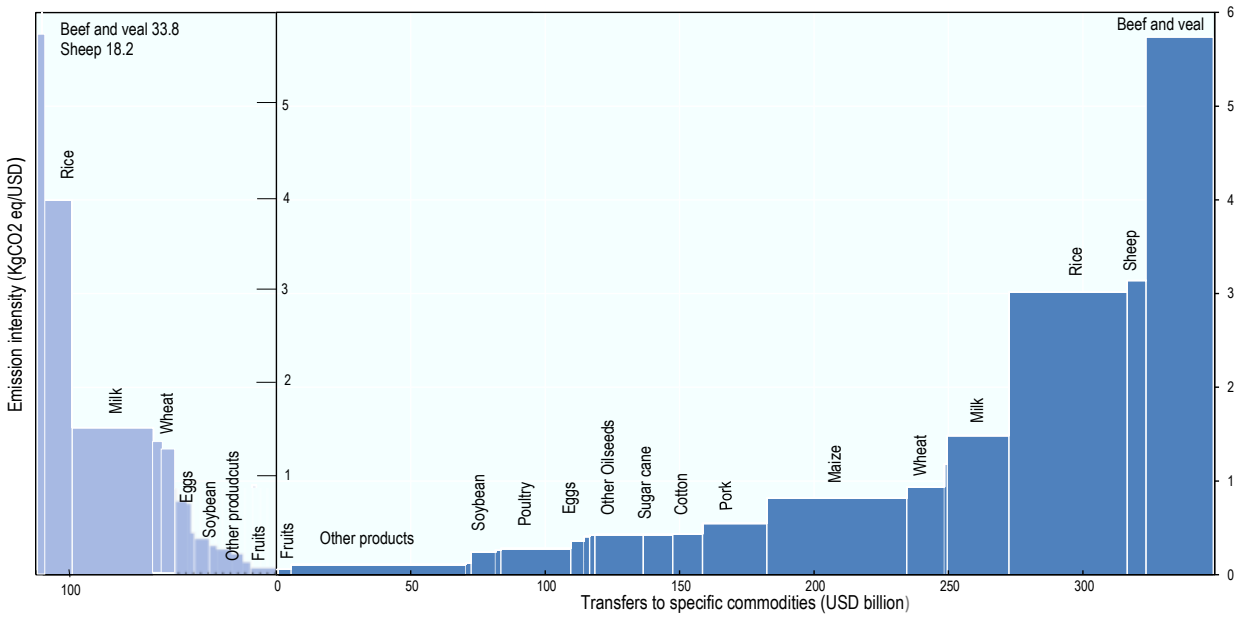
Figure 1.9. Breakdown of transfers to specific commodities (SCT), 2019-21



Notes: Countries are ranked according to the % SCT levels.
1. EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Among the commodities receiving the highest SCTs, several show particularly high emissions intensities as measured in kgCO_2eq per USD of gross farm receipts (Figure 1.10). In particular, three high emission intensity products (in terms of emissions per USD of production value – including receipts), representing 47% of the direct agricultural emissions covered in this report, receive a large volume of positive support: USD 25 billion for beef, USD 7 billion for sheep and goat meat, and USD 44 billion for rice. From a climate perspective, this corresponds to an equivalent transfer of USD 22, USD 31 and USD 115 per tCO_2eq, for these three products respectively. This support mostly comes in the form of market price support, however, rather than direct payments to farmers.

Figure 1.10. Emission intensity mapped to single commodity transfers (SCTs)



Note: Data show single commodity transfers from all 54 countries covered by this report. The dark blue bars correspond to positive SCTs, whereas the light blue bars show negative SCTs.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

StatLink https://stat.link/5vl6xw

The overall climate impact of SCTs ultimately depends on the specific instruments used. The potentially most environmentally harmful measures are output-based support, including both MPS and output payments, as they increase directly domestic production, as well as input-based payments, except if they improve the competitiveness of low-emission commodities relative to high emission ones or lessen the use of emission-intensive inputs relative to other inputs. At a global level, the widespread use of market price support has more uncertain impacts on overall production and may even lower global emissions, if raising the competitiveness of low emission production systems (Laborde et al., 2021[56]; Guerrero et al., 2022[57]).[23] The overall climate impact of reforming MPS will therefore depend on relative differences in emissions intensities in the regions where production is relocated, and the potential productivity gains associated with the reform. Local contexts and accompanying conditions for specific forms of support should also be considered. Nonetheless, SCTs generally provide relatively untargeted transfers to producers, and therefore are not as effective as targeted investments in emission-saving technologies and management practices, or other incentives to accelerate mitigation options (Gautam et al., 2022[58]). Lastly, less distortive forms of SCTs, such as payments based on area or animal numbers, can increase emissions if they favour production of more GHG intensive products, which is often the case with livestock payments. However, when associated with cross-compliance requirements on farm management practices these forms of support may also provide incentives for the adoption of mitigation measures.

Payments based on variable input use

Payments based on variable inputs deserve specific attention, as this category represented USD 60 billion of support in 2019-2021, and a large part is not covered by the SCT category. Variable inputs targeted by this category typically include the use of fertilisers, fossil fuels or irrigation, which are direct GHG emissions sources or a source of extra energy demand, and which can also cause other environmental impacts. Over

application of fertilisers and animal manure leads to substantial nitrogen surpluses, which, in addition to nitrous oxide emissions, generates local pollution, damaging freshwater ecosystems, harming invertebrates and fish, and causing acidification and eutrophication, which stimulate the growth of toxic algae and lower oxygen levels in water (hypoxia) (Guerrero, 2018[59]; Sud, 2020[60]). Similarly, irrigation subsidies can generate significant resource overexploitation issues and exacerbate water scarcity in already vulnerable regions (OECD, 2017[61]).

In most countries, there are few restrictions to protect against the over-utilisation of supported inputs, which leaves their GHG emissions impacts unabated. The optimal policy mix for support related to the use of environmentally harmful inputs would be to impose a tax rather than a subsidy to account for the damage they cause to climate, waterways and natural ecosystems (Anderson and Valenzuela, 2021[62]).

Other forms of payments

Other forms of support to producers – non-coupled area payments and other non-commodity specific payments – have a less direct impact on emissions from production and can sometimes provide other forms of environmental and social benefits. Nevertheless, payments based on current land area, even if not directed to specific crops, still create incentives to expand cultivated areas and maintain marginal lands in production. If crop area payments favour arable farming over livestock production, they may induce a shift away from livestock and a reduction in agricultural GHG emissions and nutrient surpluses. Conversely, area payments may increase GHG emissions in countries where crops account for the dominant share of agricultural GHG emissions (Henderson and Lankoski, 2019[55]).

Fully decoupled payments based on non-current crop area (e.g. payments based on historical entitlements or overall farming income) are among the least environmentally harmful support policies (Henderson and Lankoski, 2019[55]). These measures allow farmers to follow market signals in their production decisions, and in some cases, production is not required for farmers to receive support payments. If historical acreage is fixed for payments, then there is no incentive to bring additional land into the sector (Lankoski and Thiem, 2020[63]). However, payments based on historical entitlements could still affect incentives, if farmers expect their current decisions to influence future payments (DeBoe et al., 2020[64]). Moreover, by supplementing farmer incomes and making agriculture more profitable relative to other land uses, decoupled payments could still stifle structural change and hinder the conversion of agricultural land to more sustainable land uses. Ultimately, the climate impact of decoupled payments depends on the type and effectiveness of mandatory management practices and environmental requirements (cross compliance) that accompany payments (DeBoe, 2020[65]).

Reorienting agricultural support towards more decoupled payments and away from the most production distorting forms of support should support reduction of climate impacts and strengthen further the sustainability of production. At the same time, it is important to recognise that agricultural policies can shape the structure and intensity of production over the long term. Decoupling is therefore unlikely to be sufficient on its own, particularly in countries with a high livestock density and intensive production systems (OECD, 2020[66]; Lankoski and Thiem, 2020[63]). In such cases, more targeted measures may be needed to ensure that policies and market prices reflect the negative environmental externalities associated with agricultural production.

Policies that encourage emissions reductions

Payments for environmental and climate services

Agricultural policies can also be designed to generate positive environmental outcomes, by encouraging farmers to provide environmental goods and services such as carbon sequestration, preservation of rural landscapes, resilience to natural disasters, pollination, habitat provision, and control of invasive species. Agri-environmental payments that encourage the use of environmentally friendly inputs or practices

(e.g. compliance with fertiliser use restrictions) are potentially among the most environmentally beneficial types of support measures (DeBoe, 2020[65]). This applies in particular to climate change mitigation, which requires very specific management changes and technologies. That said, only USD 1.7 billion of the USD 293 billion per year of budgetary payments to producers in 2019-21 was purely dedicated to the provision of environmental public goods (i.e. payments based on specific non-commodity outputs). Larger support could however have strong direct or indirect impacts on environmental goods, through decoupled payments (see above), for instance in the case of support to organic farming. Cross-compliance associated to direct payments to producers can also bring environmental benefits compensating for the potentially environmentally harmful impacts from subsidies.

Other policies can have positive climate effects. For example, land retirement policies can create incentives for farmers to switch from crop production to permanent pasture or forests, encouraging a contraction of agricultural land and reducing environmental pressures. However, if not well-managed, a contraction of agricultural land resulting from land abandonment can in some instances lead to negative environmental outcomes such as biodiversity loss, increases in invasive species, or a greater risk of wildfire (DeBoe et al., 2020[64]). While reductions in agricultural land use often have beneficial climate effects by enhancing carbon stocks, they can also be accompanied by the intensification of production on remaining land areas, potentially resulting in unintended negative environmental impacts, including extra fertiliser emissions.

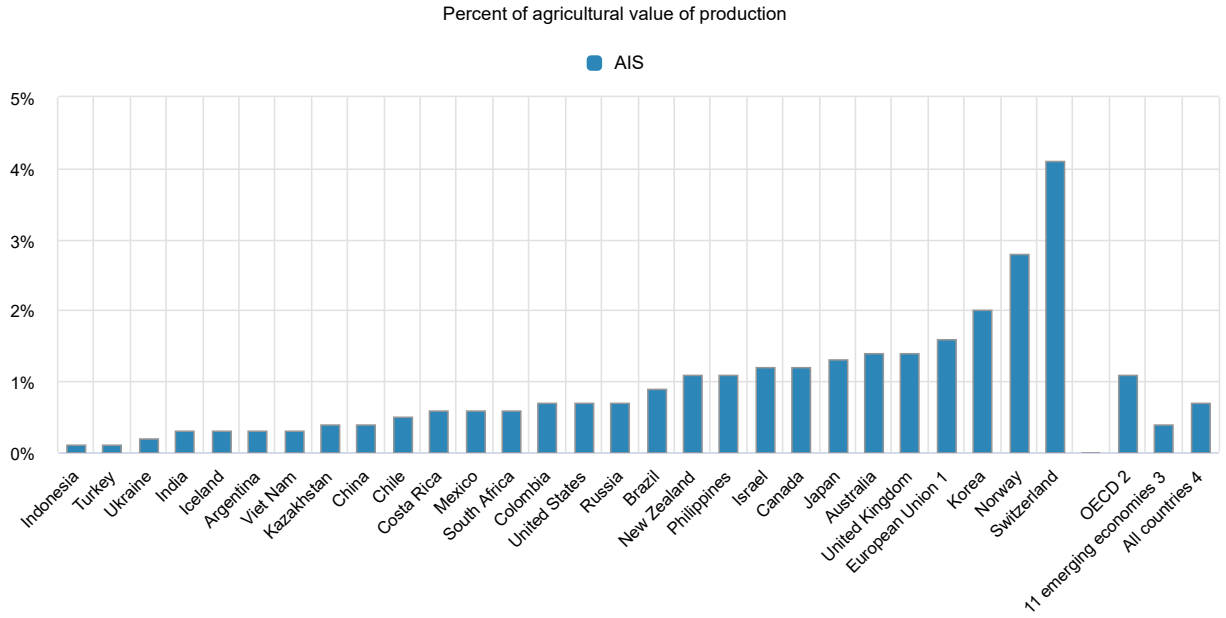
This underscores the importance of carefully managing the reform process to account for potential unintended environmental consequences. For example, reductions in market price support can also result in land abandonment and further intensification of production, with potential negative consequences for biodiversity and landscape ecology. Furthermore, agri-environmental schemes could benefit from improvements in their design to better integrate climate mitigation objectives and in the design of mandatory constraints to better deliver environmental improvements (DeBoe, 2020[65]).

Support for agricultural R&D and innovation

Support for agricultural R&D and innovation plays a vital role in helping to mitigate agricultural emissions. There is ample evidence that public investments in agricultural R&D also generate large rates of return (Alston, Pardey and Rao, 2021[67]; Alston et al., 2010[68]; Piesse and Thirtle, 2010[69]). Agricultural R&D is a key driver of productivity growth, which can help to reduce emissions by allowing more food to be produced with the same amount or fewer emissions-intensive inputs (e.g. land, fertilisers, feed). Innovations such as improvements in farm management practices, new crop varieties and livestock breeds, and new digital technologies (e.g. precision agriculture) can reduce the emissions intensity of production (i.e. emissions per unit of output) while mitigating emissions from land use change.

Support for agricultural innovation remains low at just 0.7% of the value of agricultural production for the 54 countries covered in this report (Figure 1.11). In OECD countries as a whole, public spending on agricultural innovation systems is 1.1% of the value of agricultural production, significantly higher than the average for the 11 emerging economies (0.4%). Support for agricultural innovation is highest in Switzerland, Norway and Korea, where it amounts to more than 2% of the value of agricultural production.

Figure 1.11. Support for agricultural R&D and innovation, 2019-21



Notes: Countries are ranked according to the share of government expenditure on agricultural innovation in the value of agricultural production. "AIS" refers to the Agricultural knowledge and innovation system.
1. EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

In some situations at the local level, productivity improvements may trigger increased production and will not necessarily result in lower emissions (see Box 1.3). However, channelling a greater share of R&D spending towards mitigation measures can help to foster sustainable intensification and is more likely to be successful in reducing agricultural emissions. While support for mitigation measures is increasing, there is limited evidence to suggest that it represents an important share of total funding for agricultural R&D and innovation. For example, Australia's support for the development of innovative livestock feed technologies amounts to USD 23 million over six years, which on an annual basis represents less than 0.4% of total annual spending on agricultural innovation (USD 994 million in 2019-21). Until recently, Canada's On-Farm Climate Action Fund (USD 160 million for 2021-24) represented just 6% of the agricultural innovation budget (USD 842 million in 2019-21), although new investments have just been proposed. These two examples relate to countries that have relatively high rates of support for agricultural R&D and innovation, suggesting that there is ample scope to further increase funding for R&D focused on the mitigation of agricultural emissions.

Recent studies have shown that using public expenditures on agricultural support to invest in the development and adoption of green innovations (i.e. new technologies that reduce emissions and increase productivity, such as climate smart agriculture) can reduce emissions from agriculture and land use by more than 40%, returning 105 million hectares of agricultural land to habitats (Gautam et al., 2022[58]). Unfortunately, growth in public agricultural R&D investment has been slowing over the past decade in high-income countries (Heisey and Fuglie, 2018[70]). Reversing this trend and increasing support for the development of new technologies and innovations to mitigate agricultural emissions is therefore of critical

importance to mitigate agricultural emissions. Agricultural R&D will however require time to deliver its impacts, therefore this policy measure should be used in complement to some other more immediate channels of action.

Conclusion and summary of recommendations: Reforming agricultural policies to address climate change mitigation objectives

Agriculture is a major driver of climate change, both through direct on-farm emissions and indirect emissions from land use change. AFOLU currently accounts for 22% of global anthropogenic GHG emissions; this share is projected to rise as global population growth and rising incomes continue to drive increases in food demand, and as other sectors decarbonise. Respecting the Paris Agreement's commitment of keeping global temperatures within 1.5°C above pre-industrial levels will not be possible without agriculture contributing to global mitigation efforts. The sector has significant potential to reduce its GHG emissions, and is also uniquely positioned to contribute to carbon dioxide removals through carbon sequestration. At the same time, agriculture faces unique challenges as it needs to adapt to a changing climate while providing safe and nutritious food for all and supporting rural incomes and livelihoods.

Greater policy ambition is needed for the mitigation of agricultural GHG emissions

Although agricultural emissions are included in most countries' NDCs, only 16 out of the 54 countries covered in this report have set some form of mitigation target for their agricultural sector. Some of these countries have included these targets in their NDCs or in national strategic plans, but these are not, in most cases, legally binding. Only a few countries have included agriculture in carbon pricing schemes and environmental regulations are often lagging behind when it comes to the climate dimension. There is therefore considerable scope for policy reforms to intensify and accelerate emission reductions in the sector in support of climate stabilisation.

Existing agricultural support policies contribute to higher emissions

The structure of support to agricultural production has changed little over the past decade and continues to contribute to increasing GHG emissions. Of the USD 611 billion in annual support to individual producers in 2019-21, more than half (USD 361 billion) was provided as positive transfers to specific commodities. This includes market price support (MPS) resulting from policies raising domestic market prices of agricultural products above international market levels, and payments targeted to specific commodities. These support measures provide incentives for additional domestic production, the intensification of input use, and the expansion of agricultural land, which all result in increased domestic GHG emissions (although the effect of market price support on global emissions is likely to be small and potentially negative due to differences in emissions intensities across countries). MPS could therefore be perceived as a way to reduce import-embedded emissions for low-emission intensity countries. However, such an indirect approach has uncertain impacts and is unlikely to be as effective as direct emissions pricing or targeted mitigation investments.

Countries should reduce and reform support targeting emissions-intensive products

The role of support for livestock production is particularly sensitive in this regard. Livestock is responsible for the largest share of agricultural GHG emissions, and is a strong contributor to the methane footprint globally, in particular due to enteric fermentation from ruminants. Support for livestock products, which tend to have high GHG emissions intensities, amounted to USD 111 billion, or 31% of total positive transfers to specific commodities. From a climate perspective, product-specific support is for instance equivalent to a USD 22 per tCO_2eq subsidy for beef, and a USD 31 per tCO_2eq subsidy for sheep and goat

meat. Rice also contributes significantly to emissions compared to other crops, due to methane from flooded areas. Support linked to rice production amounted to USD 44 billion, i.e. USD 115 per tCO_2eq. Most of the support above is in the form of MPS which encourages local production and may reduce domestic consumption through higher prices, but does not incentivise investments to reduce emissions. Support to other crops contributes relatively less to climate change impact, but still contributes to higher GHG emissions through fertiliser use. These forms of support should be reduced and reformed, while taking national conditions into consideration, as well as the specifics of policy design.

Subsidies for environmentally harmful inputs should be phased-out

Current policies also directly subsidise the use of variable inputs such as fertilisers, feed and fuel, amounting to USD 60 billion per year in 2019-21. Subsidies for synthetic fertilisers provided without appropriate constraints leads to increased nitrous oxide emissions, and nutrient leaching and runoff causing severe damage to freshwater resources. Subsidies for feed directly incentivise increased livestock production and related GHG emissions, whereas fossil fuel subsidies encourage carbon dioxide emissions from increased on-farm energy use. These inputs should be taxed rather than subsidised when they prove to be environmentally harmful, to account for their negative environmental externalities.

Targeted interventions towards sustainable management and productivity growth are needed

Reducing support for emissions-intensive products and inputs will not be sufficient on its own, and more targeted interventions will be needed for strong emissions abatement. Reducing direct on-farm emissions from agricultural production will require improvements in productivity and the efficiency of input use, greater deployment of new technologies, and improvements in farm management. For many crop producers, this entails improving cultivation practices, increasing the efficiency of fertiliser use, and promoting the use of precision agriculture and integrated crop management. Livestock emissions can be addressed through a combination of improvements in feed conversion efficiencies, better feed and pasture quality, strengthening farm and animal management, as well as methane inhibitors such as feed supplements. Production needs can be decreased by limiting on-farm losses through more resistant crops, improved harvesting equipment and techniques, better storage infrastructure and logistics. On-farm energy consumption can also be reduced by promoting renewable energies and the adoption of greener and more efficient fuels to power agricultural machinery. Agriculture can also help reducing fossil fuels consumption via bioenergy sustainable production.

On the land use change side, there are also several avenues to significantly reduce emissions. Forest protection, coupled with improvements in agricultural productivity, can play an essential role in limiting the expansion of agricultural land and can also create opportunities to sequester carbon by restoring and reforesting marginal lands. Halting and reversing peatland conversion can also be achieved at relatively low cost. Soil carbon sequestration can be achieved through measures such as improved management of crop rotations, residues, vegetation, cattle stocking densities and cropland-pasture integration. Agricultural plantations, agroforestry and afforestation on agricultural land are also promising avenues for carbon sequestration.

Support should transition towards less coupled payments and payments for environmental public goods

Other forms of support to producers, including non-coupled area payments and other non-commodity specific payments, have less of a direct impact on emissions from production, and bring environmental co-benefits through cross-compliance. Nevertheless, payments based on current land area, even if not directed to specific crops, may still create incentives to expand cultivated areas and maintain marginal

lands in production. There is large room to make these payments more beneficial for climate action. Payments can be made conditional on the provision of environmental goods and services such as carbon sequestration, afforestation and the restoration and rehabilitation of marginal lands. In 2019-21, only USD 1.7 billion of the USD 293 billion per year of budgetary payments to producers was purely dedicated to the provision of environmental public goods (i.e. payments based on specific non-commodity outputs). Larger support could however have strong direct or indirect impacts on environmental goods, through decoupled payments (e.g. for organic farming). Funding to climate services in agriculture should be ramped up to accelerate the adjustments needed at farm level.

Including agriculture in carbon pricing schemes could incentivise the transition to low-emission agriculture

Mechanisms that put an explicit price on emissions are the most efficient way to minimise the abatement burden for the sector, by recognising the heterogeneity of abatement costs across producers. Carbon pricing options include emissions taxes and emissions trading schemes, carbon offsets, and some abatement subsidies (e.g. delivered via auctions). Participation in voluntary schemes such as carbon offsetting and abatement subsidy programmes are limited by the availability of public and private sector funding to pay producers for emissions reductions. They also require strong transparency and integrity standards to ensure additionality, potentially limiting their scope and effectiveness. Conversely, instruments that apply the “polluter pays” principle such as emissions taxes are among the most effective and efficient policies to mitigate agricultural emissions, but they shift a part of the burden on consumers, which may require accompanying measures.

In spite of their efficiency and use in other sectors, there are currently relatively few examples of countries that have introduced emissions pricing to mitigate agricultural emissions. Agricultural emissions tend to be excluded from most economy-wide carbon taxes and emissions trading schemes, and are often dealt with through other complementary mechanisms. Applying pricing schemes to the agricultural sector could support more ambitious mitigation plans, even if such schemes will need to be adapted to the specific context and constraints related to the sector.

In addition to emissions pricing instruments, stronger environmental regulations and cross compliance can also help to reduce emissions

Strengthening environmental regulations can also accelerate progress on the mitigation of agricultural emissions. For example, governments can link support with measures to prevent additional clearing of forests and expansion of agricultural land. As a good practice, support should not be provided to farmers participating in illegal deforestation or conversion and drainage of peatland. Cross-compliance attached to farm payments could also be used to broaden the adoption of climate-friendly practices in agriculture. Tighter environmental regulations and standards may also be needed in other related policy domains such as water and air quality to foster climate action in agriculture.

Demand-side measures may also be needed, including efforts to reduce the emissions intensity of consumer diets

More sustainable production will help to limit the climate impacts of agriculture but may not be sufficient for the level of transformation needed. Deeper structural change will also have to take place to reduce the carbon footprint of agricultural production, requiring a food systems perspective and adaptation along the supply chain and in demand patterns. This may require changes in consumer behaviour to reduce the consumption of emissions-intensive products, in particular products of animal origin, in countries where per capita protein consumption far exceeds dietary guidelines. Dietary changes could also bring potential co-benefits for consumers in terms of health and nutrition improvements. Lower consumption of livestock

products can also reduce deforestation and biodiversity losses due to the expansion of pasture and cropland for feed production. Actions encouraging consumers to limit food waste and overconsumption can also help to mitigate agricultural emissions by reducing the volume of production needed, even though abatement scope is more limited for that route.

Greater support should be provided for R&D and innovation to mitigate climate change

Last, support for agricultural R&D and innovation has a vital role to play in agricultural emissions mitigation. Support for agricultural innovation amounted to only USD 26 billion in 2019-21 and remains low at just 0.7% of the value of agricultural production. While support for mitigation measures has been increasing, its share of total funding for agricultural R&D and innovation remains small. Channelling a greater share of R&D spending towards mitigation measures can help to foster sustainable productivity growth and develop the new technologies needed for low-emissions agriculture. Governments should improve public agricultural R&D funding, create the conditions to attract private investment and facilitate public-private partnerships and international R&D co-operation, with the involvement of farmers and other stakeholders.

Climate action for agriculture should build on synergies and manage potential trade-offs

Considering the urgency of the climate change challenge, agriculture should embrace climate action rapidly. However, optimal policies should take account of wider implications for food systems, exploit synergies with other social and environmental objectives and be balanced in each context with potential adverse impacts. For example, measures aiming to reduce deforestation or limit the use of synthetic fertilisers also result in improvements in biodiversity, soil health and water quality, but may come in conflict with agriculture production needs. Demand-side policies that encourage shifts towards lower emission intensity diets can have potential co-benefits for public health but may also pose a threat to farmers living from livestock production.

The introduction of emissions taxes may imply higher costs for some producers and consumers, and should be accompanied by transitional assistance and targeted transfers to the most vulnerable populations that may be affected by higher food prices. On the other hand, paying farmers to reduce their emissions can ease the impact on producers and consumers, but may also put pressure on public finances unless balanced by a reduction in existing agricultural support. A broader food systems approach is required to address these challenges and to take a holistic view on the performance of climate measures, in light of other multiple policy objectives and implications for the various stakeholders.

As with other food systems issues, effective climate action for agriculture will require collaboration between different policy communities (climate, agriculture, rural development, food security, public health), as well as overcoming barriers related to facts, interests, and values (OECD, 2021[40]). Robust, inclusive, and evidence-based processes are thus essential.

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Notes

[1] The agriculture category from UNFCCC inventories covers only the non-CO_2 emissions associated with agricultural production and some small CO_2 sources related to soil improvements. Fossil-fuel emissions generated on the farm are accounted as part of the "Energy" sector. Changes in carbon stocks in agricultural soils are accounted as part of the LULUCF category.

[2] LULUCF corresponds to the land use and land use change part of AFOLU, therefore AFOLU = agriculture + LULUCF.

[3] Emissions from AFOLU in 2010-19 averaged 11.9 ± 4.4 billion tonnes carbon dioxide equivalent ($GtCO_2eq$), out of a total of 56.3 ± 6.1 $GtCO_2eq$, per year. In 2019, AFOLU emissions amounted to 12.8 ± 5.0 $GtCO_2eq$ out of a total of 58.6 $GtCO_2eq$ with IPCC AR6 GWP100 for CH_4 and N_2O (IPCC, 2022[5]; Minx et al., 2021[6]).

[4] 5.9 ± 4.1 $GtCO_2eq$ per year.

[5] 6.0 ± 1.7 $GtCO_2eq$ per year for the IPCC agriculture category (which excludes on-farm energy consumption).

[6] On average, agriculture generates 4.2 ± 1.3 $GtCO_2eq$ per year in methane emissions and 1.8 ± 1.1 $GtCO_2eq$ per year in nitrous oxide emissions.

[7] Global Warming Potentials (GWPs) are used to convert GHGs to carbon dioxide equivalent (CO_2eq), providing a common scale to measure the climate impacts of individual GHGs. Carbon dioxide is the reference and has a GWP of 1 for all time periods. Methane from non-fossil sources such as agriculture is estimated to have a global warming potential (GWP_{100}) of 27.0 ± 11, meaning that one tonne of methane emissions will absorb 27 times more energy over a 100-year period than one tonne of carbon dioxide. Nitrous oxide has a GWP_{100} of 273 ± 130 times that of carbon dioxide for a 100-year timescale.

[8] Average annual non-CO_2 emissions from agriculture have risen from 5.2 ± 1.4 $GtCO_2eq$ during 1990-99, to 6.0 ± 1.7 $GtCO_2eq$ for the period 2010-19 (using IPCC AR6 GWP_{100} values to aggregate CH_4 and N_2O emissions to CO_2eq) (IPCC, 2022[5]). Non-CO_2 LULUCF emissions are estimated to account 0.6 $GtCO_2eq$ and are accounted separately in IPCC (2022[5]).

[9] Or 4.1 $GtCO_2eq$.

[10] The share of livestock emissions associated with enteric fermentation, manure management and manure deposited on grassland accounts for 67% of direct agricultural emissions over the 54 countries covered in this report, based on IPCC AR6 GWP_{100} for methane and nitrous oxide. When adding manure applied to cropland as organic fertiliser, this emissions share rises to 70% (FAO, 2022[36]).

[11] Earlier estimates from (IPCC, 2019[71]) put global food systems emissions at between 10.8 and 19.1 $GtCO_2eq$ per year, or 21-37% of total anthropogenic emissions. According to (Poore and Nemecek, 2018[13]), food systems generate 26% of anthropogenic GHG emissions; this rises to 31% if non-food agriculture and other drivers of deforestation are included. (Crippa et al., 2021[11]) found that food systems

contributed 34% to total anthropogenic GHG emissions in 2015, while (FAO, 2021[12]) estimated total emissions from food systems at 16.5 $GtCO_2eq$, or 31% of global emissions in 2019.

[12] At 1.2 kg CO_2eq/USD and 1.1 kg CO_2eq/USD respectively.

[13] At 1.2 t CO_2eq/ha and 1.5 t CO_2eq/ha respectively.

[14] Estimates are based on a comprehensive meta-analysis of 1 530 studies covering more than 38 000 commercial farms in 119 countries.

[15] Beef originating from beef herds generates 90 kg CO_2eq per kg of product and 45 kg CO_2eq per 100g of protein. Lamb and mutton generates 34 kg CO_2eq per kg of product and 17 kg CO_2eq per 100g of protein.

[16] 30 kg CO_2eq per kg of product and 15 kg CO_2eq per 100g of protein.

[17] Rice generates emissions of 3.9 kg CO_2eq per kg of product. Most grains generate less than 3 kg CO_2eq per kg of product and per 100g of protein, while most fruits, vegetables, roots and tubers have average emissions of less than 1 kg CO_2eq per kg of product.

[18] In these examples, highest emissions refers to the 90th percentile, while lowest refers to the 10th percentile. The highest emissions from beef reach 188 kg CO_2eq per kg, compared to 34 kg CO_2eq per kg for the lowest within beef herds and 16 kg CO_2eq per kg for the lowest within dairy herds.

[19] The lower bound corresponds to the average results based on Integrated Assessment Models (IAMs). These models have the advantage of capturing the possible combinations between options in a structurally consistent framework, but they do not capture all the range of mitigation options analysed by sectoral models.

[20] Technical potentials can be as high as 8 $GtCO_2eq$ for dietary changes and 5.8 $GtCO_2eq$ per year for food loss and waste reduction, according to IPCC (2022[5]). Considering there are strong overlaps between these two mitigation options, acting on the same sources, we do not sum up here the two estimates but only present the highest.

[21] For instance, in the case of beef originated from beef herds, 25% of production with the largest emissions intensities represent 56% of the sector's emissions and 61% of land use (Poore and Nemecek, 2018[13]).

[22] This is also true for other forms of environmental policies. Studies have shown that most distortive agricultural support is also the most environmentally harmful from a nitrogen pollution perspective (Henderson and Lankoski, 2019[55]; Henderson and Lankoski, 2020[72]; OECD, 2020[66]; DeBoe, 2020[65]), or for biodiversity (DeBoe, 2020[65]; Lankoski and Thiem, 2020[63]).

[23] Laborde et al. (2021[56]) estimate that removing domestic support and border measures would increase direct agricultural emissions by 1.7%. Guerrero et al. (2022[57]) finds in a similar assessment accounting for the full AFOLU that such policy change would generate an emission increase of 0.5%.

2 Developments in Agricultural Policy and Support

This chapter presents a cross-cutting analysis of agriculture policy trends based on information and support estimates gathered for 54 countries covered in OECD's *Agricultural Policy Monitoring and Evaluation 2022*. It provides an overview of recent economic and market developments that influence the context for the implementation of agricultural policies. It then briefly outlines the implications on agricultural markets and policies of Russia's aggression against Ukraine by looking at both agricultural products and key inputs; an overview of policy responses by governments to help the agricultural sector and food systems to continue functioning is included in this section. The third section presents developments in agricultural policies in 2021-22, as well as an analysis of developments in the level and structure of support to agriculture and a discussion on the impacts of COVID-19 on support provided in 2020 and 2021. Key recommendations for reforms to better address public objectives conclude this chapter.

In 2021, agricultural policies and support to the sector continued to be affected by the ongoing pandemic caused by the coronavirus SARS-CoV-2. Most countries have undergone repeated waves of high infection rates and subsequent restrictions on populations and enterprises to contain the virus. That said, after the slowdown of the world economy in 2020, global GDP rebounded and unemployment receded in 2021, while the agricultural sector continued to demonstrate considerable resilience in the face of multiple stresses. At the same time, there are growing concerns that rising commodity prices may strain food security in some regions and stall economic recovery. In particular, flat or lower supplies, notably of natural gas, are tightening otherwise resurgent energy markets.

The growing tensions between the Russian Federation (hereafter "Russia")[1] and Ukraine towards the end of 2021, and the large scale aggression by Russian forces against Ukraine in February 2022, risk additional and major implications for economies in general, and for global food markets in particular. This report describes the evolution of agricultural policies and quantifies the extent of support to the sector through to the end of 2021, i.e. preceding the war in Ukraine. That said, given their potential gravity, consequences of the war for agricultural markets and early policy responses are discussed further below.

This chapter first presents the general economic and market context in which agricultural policies evolved over 2021. The second section provides a brief discussion of the Russian large scale aggression against Ukraine by looking at both the implications for markets for major agricultural commodities and production inputs, and at responses by governments to mitigate the consequences for their agricultural producers and consumers. The third section then provides an overview of developments in agricultural policies in 2021 and early 2022. The fourth section provides different indicators of the support that is generated by agricultural policies for the sector. It also provides estimates of the changes in agricultural support induced by policy responses to the COVID-19 pandemic. The chapter concludes by briefly assessing this support against the broad set of policy objectives for the agricultural sector.

Key economic and market developments

Conditions in agricultural markets are strongly influenced by macro-economic factors, such as economic growth (measured by gross domestic product, GDP), which drives demand for agricultural and food products, as well as by prices for crude oil and other energy sources that underpin many production inputs in agriculture, such as fuel, chemicals and fertiliser. Energy prices also affect the demand for cereals, sugar crops and oilseeds through the market for biofuels produced from these feedstocks.

Global GDP, which shrank by more than 3% in 2020 due to the COVID-19 pandemic and related restrictions, rebounded in 2021 to grow by 5.6%. At the end of 2021, output in most OECD countries was close to or above pre-pandemic levels (OECD, 2021[1]). Across OECD countries, growth was particularly strong, at rates between 9% and more than 15%, in Ireland, Colombia, Estonia, Costa Rica and Turkey, but remained below 2% in Japan. Across the Euro area, growth was close to the OECD average at 5.2%; however, this did not offset the economic contraction in 2020 (-6.5%).

The rebound in OECD economies in 2021 was associated with an increased demand for labour. Across the OECD area, unemployment, which in the context of the COVID-19 pandemic had increased to 7.1% in 2020, fell by almost one percentage point in 2021. At 6.2%, however, the level of unemployment continued to be higher than in 2019. In many countries, substantial public interventions put in place in 2020 to mitigate the negative impact of the pandemic on employment, continued in 2021, including notably publicly supported short-time work.[2] Average inflation, which had been falling for several years and had dropped to 1.5% in 2020, rose to 3.5% in 2021, driven, amongst other factors, by rising energy and food prices (see below).

Growth in emerging economies also rebounded in 2021, although the extent of the recovery varied. Amongst the countries covered in this report, India's rebounded most strongly, with 9.4% growth, following

a 7.2% decline the previous year. The People's Republic of China (hereafter "China") and Argentina saw GDP growth of around 8%, moderately higher than Chinese pre-pandemic growth rates but the highest growth in Argentina in a decade. Recovery was more modest in South Africa, Brazil and notably Indonesia, where growth barely exceeded 3%, well below pre-pandemic growth rates.

Signs of global economic recovery were also seen in international trade. In real terms, global trade increased by more than 9% year-on-year, after an 8.4% contraction in 2020.

Table 2.1. Key economic indicators

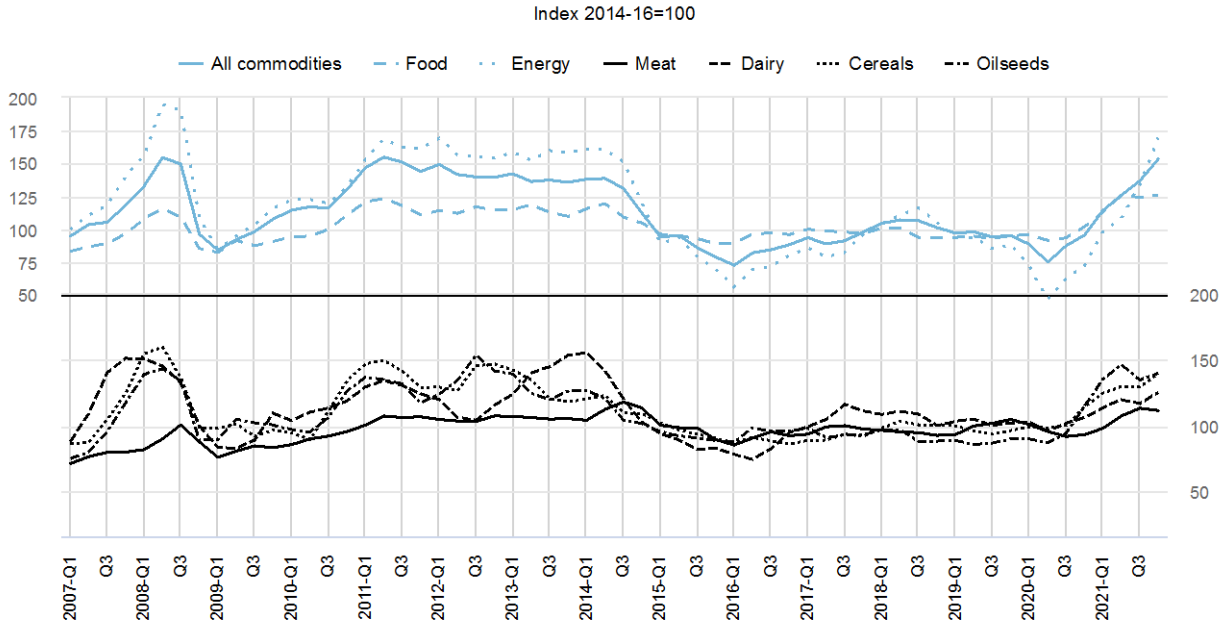
	Average 2009-18	2019	2020	2021
Real GDP growth[1]				
World[2]	3.2	2.8	-3.4	5.6
OECD[2]	1.6	1.7	-4.7	5.3
United States	1.8	2.3	-3.4	5.6
Euro area	0.8	1.6	-6.5	5.2
Japan	0.7	0.0	-4.6	1.8
Non-OECD[2]	4.9	3.7	-2.2	5.8
Argentina	1.0	-2.0	-9.9	8.0
Brazil	1.3	1.4	-4.4	5.0
China	8.0	6.0	2.3	8.1
India	7.0	4.0	-7.3	9.4
Indonesia	5.4	5.0	-2.1	3.3
South Africa	1.6	0.1	-6.4	5.2
OECD area				
Unemployment rate[3]	7.3	5.4	7.1	6.2
Inflation[1,4]	1.6	1.9	1.5	3.5
World real trade growth[1]	3.6	1.4	-8.4	9.3

1. Percentage changes; last three columns show the increase over a year earlier.
2. Moving nominal GDP weights, using purchasing power parities.
3. Per cent of labour force.
4. Private consumption deflator.
Source: OECD (2021), OECD Economic Outlook N°110 - December 2021, https://stats.oecd.org/.

The acceleration of economic activity, combined with reduced restrictions on personal and business mobility, resulted in rising prices for non-food commodities in general, and for energy (and, consequently, fertilisers) in particular (IMF, 2022[2]). On average, energy prices in 2021 were twice as high as in 2020, after a 30% decline between 2019 and 2020. Prices for natural gas in particular rose by 263%, driven also by the cold European winter and tensions over the Nord Stream 2 pipeline connecting Russian supplies to the European market. Crude oil prices rose by 64% year-on-year in 2021, while coal prices also more than doubled on average. As a consequence of higher energy prices, fertiliser prices rose by almost 80%. The Russian large scale aggression against Ukraine and the subsequent tightening of sanctions against Russia will reduce Russian and Ukrainian exports of energy and fertiliser and looks set to drive prices higher in 2022 (see below and next section on this).

Food prices increased by less than energy prices in 2021, but still significantly. International food prices averaged some 28% higher in 2021 than in 2020, a higher year-on-year change than during the food price crisis of 2007-08. Price increases have differed across commodities, but generally have been more modest in livestock markets than for crops (FAO, 2021[3]).

Figure 2.1. Commodity world price indices, 2007 to 2021



Note: The top part of the graph relates to the left scale, while the bottom part of the graph to the right scale.
Source: IMF (2022), Commodity Market Review, for all commodities, food and energy indices (base year: 2016), www.imf.org/external/np/res/commod/index.aspx; FAO (2022), FAO Food Price Index dataset, for meat, dairy and cereal indices (base period: 2014-16), www.fao.org/worldfoodsituation/foodpricesindex/en.

World meat production declined in in 2019 and was flat in 2020, driven primarily by the impact of African Swine Fever (ASF) on China's pig meat sector. Global meat production increased by more than 4% in 2021, due mainly to rebounding output in Asian pig meat production, complemented by increased stock liquidation in China following the price declines. Meat production also increased in most other regions, with the exception of Oceanian beef, where restocking and lower cattle inventories resulted in lower output. Strong import demand lifted global meat prices by almost 13% year-on-year in 2021, although slowing imports by China led to some modest price declines since August 2021.

World dairy markets were impacted by strong import demand, especially from Asia, and often limited exportable supplies from major producing regions. Global milk production increased in most regions, led by Asia and North America, driven both by growing cattle numbers and increasing farm productivity and milk yields. However, lower rainfall and higher grain prices led to small production declines in South America. Overall, world dairy prices almost uninterruptedly continued the upward trend that began in mid-2020. On average, dairy prices in 2021 were 17% higher than those in 2020.

World prices for crop commodities saw even stronger growth in 2021. Oilseed markets, already buoyed by strong feed import demand from China in 2020, came under further pressure from rebounding demand for vegetable oils and continued growth in feed demand for oilseed cakes and meals. Despite strong growth in oilseed output, stocks in major exporting countries had declined during the 2020-21 marketing year.[3] As a consequence, average oilseed prices in 2021 were 44% higher than in 2020, led by prices for vegetable oils, which increased by almost two-thirds year-on-year.

Global cereal production increased slightly in 2021. Higher coarse grain output, particularly in China, Ukraine and the United States, more than offset lower production of wheat, notably in Canada and the United States. Lower incidences of droughts and floods in Asia helped to increase global rice production. While food cereal use largely grew in line with population growth, feed use, notably of wheat, rose more

strongly due to higher livestock production and herd sizes and rising oil meal prices. Lower stock-to-use ratios and strong growth of Chinese maize imports underpinned rising cereal prices, which, on average in 2021, were 27% higher than in 2020.

Production recoveries notably in the European Union and Thailand in 2021 reversed three years of decline in global sugar production. Despite this increase, output fell short of demand, which was underpinned by the economic recovery and which experienced particularly strong growth in India and China. In view of the continued tight market, world sugar prices averaged 37% higher in 2021 than in 2020.

Overall, average farm receipts (including budgetary transfers from agricultural policies) across the 54 countries covered in this report continued their rising trend since 2016 and are estimated to be 19% higher in 2021 than in 2019 (OECD, 2022[4]). This suggests that, on average and partly due to rapid policy responses, the COVID-19 pandemic has not had major negative implications for farmer incomes in the countries covered by this report.

The Russian large scale aggression against Ukraine can be expected to continue affecting agricultural commodity supplies and prices. Significant international sanctions against Russia are in place and Ukrainian trade infrastructure and cereal and oilseed production are affected. Global shortages of major production inputs, such as energy and fertilisers, are also possible. While data on developments in agricultural commodity prices since the beginning of the aggression remain incomplete, world prices for crude oil jumped by more than 30% within ten days of the large scale aggression, before declining to more moderate levels.

The Russian large scale aggression against Ukraine: First implications for agricultural markets and policies

On 24 February 2022, Russian troops began a large-scale military aggression against Ukraine. Three days earlier, the Russian Government had officially recognised the independence and sovereignty of the so-called Luhansk People's Republic and Donetsk People's Republic regions of Ukraine. At the time of writing, the Russian large scale aggression against Ukraine continues.

As a consequence, and building on earlier measures in place since the Russian annexation of Crimea, a large number of countries, including the United States and the European Union, imposed sanctions related to trade (excluding food and fertilisers) and travel to or from the Russian Federation and Belarus, among others (PIIE, 2022[5]). In addition, as a direct consequence of the large scale aggression, trade infrastructure in Ukraine, including in particular its Black Sea ports, has been significantly impacted. Given the evolving conflict, the implications for agricultural production in Ukraine remain uncertain. Finally, Russia has announced a temporary export ban for key agricultural products, including notably cereals and sugar, and implemented export bans and licensing for certain nitrogen fertilisers.

This section provides a first assessment of the implications that reduced trade with Ukraine, Russia and Belarus may have for agricultural markets and policies globally.

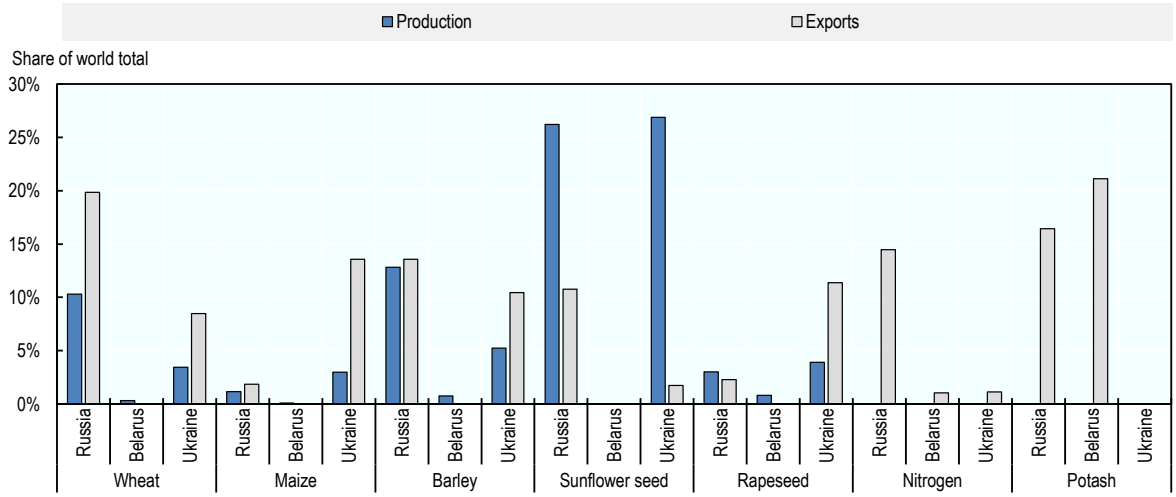
The importance of Russia, Belarus and Ukraine in world markets for relevant commodities

Russia and Ukraine are key producers and exporters of several agricultural commodities, including cereals and oilseeds. Combined, the two countries accounted for 28% of global wheat exports in 2018-20, while the corresponding shares are 15% for maize, 24% for barley, 12% for sunflower seed and 14% for rapeseed. The sunflower share is higher when derived products such as oil and meal are included: in 2018-20, Ukraine and Russia accounted for around 43% and 20% of global sunflower oil exports, respectively.

Together with Belarus, Russia is also amongst the main exporters of fertilisers. The two countries represented 16% of global nitrogen exports, and 38% of potash exports in 2018-20. Russia's role as the world's largest nitrogen exporter is related to its significant production of fossil fuels, of which it is also amongst the top exporters. Russia also exports significant amounts of mixed fertilisers containing phosphorous.

Figure 2.2. Shares of Russia, Belarus and Ukraine in global production and exports of selected agricultural commodities and fertilisers

Average 2018-20



Note: Agricultural commodities data in volumes, fertilisers data in values. No production data available for nitrogen and potash fertilisers.
Source: FAOSTAT (2022), https://www.fao.org/faostat/en/#data; UN Comtrade (2022), https://wits.worldbank.org/.

StatLink https://stat.link/faspgq

Implications for markets

Given the importance of these countries for global agricultural markets, the Russian large scale aggression against Ukraine and the political responses have significant and potentially longer-lasting implications for markets for both agricultural inputs and outputs, and hence also for farmers and consumers. Crude oil prices increased by more than 30% within ten days following the invasion, though they have subsequently fallen back to levels only moderately higher than just prior to the aggression.

Price volatility remains significantly above levels seen in late 2021. Export prices for major agricultural commodities, have climbed significantly (World Bank, 2022[6]). The IGC Grains and Oilseeds Index, which shows movements in export prices for grains and oilseeds, rose to its highest level on record in mid-March 2022.[4] Fertiliser prices, in particular for potash and nitrogen, have also seen significant increases.[5] Moreover, higher crude oil prices are adding to already high ocean transport costs. Overall, available information suggests that so far input prices may have increased more strongly than average crop prices, while livestock prices appear to be least affected. This would increase food costs, and likely affect margins for both crop and livestock producers.

Policy responses

In addition to humanitarian, economic and military responses aimed at Ukraine and Russia, countries have begun to implement measures to reduce the burden of the war for both agricultural producers and consumers.[6] Among these, changes in countries' trade policies are most prominent. Several countries have **announced, implemented or extended export bans, taxes or other export restrictions** including Egypt (key staples); Hungary, Moldova and Serbia (grains); and Argentina (soybeans and soybean products). China, which holds a large share of the world's grain stocks, has signalled that it may hold back on rice exports. Turkey has banned the export of grains and several other food commodities held in bonded warehouses at Turkish seaports. These measures come in addition to the export bans implemented by Russia.

That said, Argentina has also ceased registration of export sales of soybean oil and meal and reopened export sales for both products, which may offset some of the effect of the higher export tax. Argentina also increased its annual export quota for wheat.

Some countries have **reduced import barriers**. For instance, Switzerland decided to reduce import tariffs for feed grains from 15 March, while Turkey suspended documentation requirements for imports of agricultural products or transit trade loaded from Ukraine. Israel enlarged its import quota for table eggs, although this expansion may reflect increasing consumption during the Jewish Passover rather than a response to the war in Ukraine. Egypt facilitated imports by temporarily raising the moisture limit for imported wheat. Brazil temporarily eliminated import duties for several agricultural commodities, including ethanol and soybean oil.

More broadly, the European Union has also announced the use of "green lanes" over land to facilitate the importation of agricultural commodities from Ukraine. Several South-American countries have also submitted a proposal to the FAO calling for the exclusion of fertilisers from international sanctions on Russia.

Domestic measures in response to the crisis have to date focused on **relaxed production constraints**, **direct support to farmers** and **labour markets**. The European Union has launched several policies, such as a derogation to grow food and feed crops on fallow land without loss of greening payments, and a support package allowing for additional support to farmers. Member States can opt for such policies. For example, Germany announced that, in 2022, it would exceptionally allow the use of crops as fodder on ecological priority areas in the categories "fallow land" and "catch crops". Spain, Finland, France and China have all made additional funds available to help farmers cope with high input costs. Similarly, China has provided additional support to stabilise incomes and compensate grain producers for rising input costs, while the Czech Republic also abolished mandatory biofuel blending to increase grain availability on the market. The Czech Ministry of Agriculture also plans to launch a dedicated website to connect Ukrainian refugees with farms and other companies offering employment and accommodation.

Beyond those first-response measures, countries are also strengthening efforts to **reduce their vulnerability** to such shocks and to enhance their resilience more broadly. Several countries, such as Bulgaria and Egypt have increased efforts to build strategic reserves of food or feed commodities. Some have increased diplomatic efforts to open new markets for their produce previously exported to Russia (e.g. Colombia), or to find alternative sources, to supply their import needs, notably for fertilisers (e.g. Brazil, Costa Rica). Additional efforts are also being made to facilitate and promote the domestic supply of alternatives to imported fertilisers, e.g. through organic fertiliser sources or, in the longer run, domestic fertiliser production from fossil fuels.

For its part, **Ukraine** has imposed export license requirements for exports of wheat, poultry and eggs from 6 March 2022; maize and sunflower oil, originally included, have been removed from the list of products subject to export licensing. On 12 March 2022, Ukraine has also introduced a *de facto* export ban on a range of mineral fertilisers. On the import side, on 16 March 2022 Ukraine has eliminated excise duties on

all imported goods. Domestically, Ukraine has introduced an additional farm loan programme and increased efforts to build strategic reserves of food and feed.

First assessment

Policies implemented in response to the market implications of the Russian large scale aggression against Ukraine focus on different areas, with trade policies dominating in the short term. Most of these aim to insulate domestic markets from the significant increases in international prices for agricultural commodities and inputs. That said, while export bans and other restrictions can temper domestic price increases for the covered commodities, they will further accelerate price spikes on international markets and undermine the trust that countries have in the reliability of the international trading system as a source of supply. For this reason, export restrictions should be avoided and, where already implemented, should be dismantled as soon as possible. In contrast, reductions of import barriers and simplification of trade procedures can facilitate trade and the functioning of international markets and should be made permanent to the extent possible.

There are new calls to relax environmental constraints, highlighting the trade-offs between environmental sustainability objectives and immediate concerns about the shortfall in global food supplies and potential consequences for food security. Countries considering such measures on an exceptional basis need to weigh the potential for other measures to address the consequences for food supplies, including the release of stocks, direct assistance to help consumers cope with higher food prices, and specific support for those countries facing burdensome food import bills. They also need to weigh the risk that measures is that they may be difficult to rescind, and may provide limited or marginal assistance with the current pressures, while carrying important longer term environmental costs, in particular for biodiversity. The balance may be particularly unfavourable if the agricultural land concerned has low productivity but high potential environmental value.

Compensating for labour shortages due to the reduced availability of migrant workers can be a particular challenge for countries neighbouring Ukraine. Ensuring that available workers among refugees are matched with labour needs on farms and in related companies in the short run will require simplified registration and employment procedures.

Recent developments in agricultural policies

Several countries revised their agricultural policy frameworks

Australia launched the *Delivering Ag2030* strategy, which aims to strengthen trade, biosecurity, natural resource management, supply chains and infrastructure. **Canada** issued the *Guelph Statement*, setting out the direction for the future of agricultural policy with priorities including tackling climate change, supporting research and innovation, and enhancing resilience. **China** launched a new *Five-Year Plan for Promoting Agricultural and Rural Modernisation 2021-25*, focusing on food security and improving living conditions in rural areas.

The **European Parliament and Council** reached political agreement on reforming the EU Common Agricultural Policy (CAP) for 2023-27. The new legislation seeks to ensure a sustainable future for European farmers, provide more targeted support to smaller farms, and allow greater flexibility for EU countries to adapt measures to local conditions. **Iceland's** new *Agricultural Framework Agreement* entered into force, covering the general operating environment for the agricultural sector. **Indonesia** established Badan Pangan Nasional (BAPANAS), a new national food agency under the authority of the President, with the objectives of stabilising prices of food staples, maintaining food availability, implementing food importation policies, achieving food and nutrition security, and ensuring food safety. **Kazakhstan** endorsed

the *National Project*, which aims to improve productivity, exports, agro-food processing, and rural incomes over the next five years.

Norway's new government set out its policy priorities for agriculture in its *Hurdal Platform*. The platform identifies closing the income gap between agriculture and other groups in society as a key concern, and proposes reforms to the milk quota system, a cap on production subsidies, and new targets for food self-sufficiency. **Turkey** prepared its *National Food Systems Pathway*, including 10 main priority areas and 117 actions to transform food systems and achieve the Sustainable Development Goals by 2030. **Viet Nam** introduced several new strategic policy documents, including the *Resolution on National Food Security until 2030*; the *Agricultural Industry Structural Plan for 2021-2025*; and *the Scheme for Restructuring Viet Nam's Rice Sector by 2025 and 2030*.

Some countries introduced new measures (or extended existing measures) in response to the COVID-19 pandemic

The **Australian** Agriculture Visa was announced to help address workforce shortages in the agricultural sector. **Australia** also extended its *International Freight Assistance Mechanism*, providing additional support to keep international supply chains open in the context of COVID-19 related trade disruptions. The **European Union** prolonged its State Aid Temporary Framework to support the economy in the context of the COVID-19 pandemic, and the European Commission adopted exceptional measures to support the wine, fruit and vegetable sectors.

In response to the second wave of the COVID-19 pandemic, **India** extended the Pradhan Mantri *Garib Kalyan Anna Yojana* (PMGKAY) food distribution programme, adding nearly USD 10 billion to the cost of the programme. The government of the **Philippines** maintained measures to protect producers' livelihoods and food security, such as the Rice Resiliency Project which aims to increase the country's self-sufficiency in rice production. The government also expanded funding for additional loans and loan guarantees to small farmers under the SURE COVID programme, and extended retail price controls on basic food items in 2021.

The **United States** established a number of ad hoc programmes to reduce the impact of market disruptions related to the pandemic. This includes compensation for reduced processing capacity for pork and poultry, and targeted voluntary programmes to encourage donations of surplus dairy products to feeding programmes. **Viet Nam** continued to provide support to offset the impacts of the COVID-19 pandemic on farmers, including deferred taxation, monetary payments and concessional credit. Over 250 000 tonnes of rice were distributed from reserve stocks, while tariffs on certain agricultural products were lowered to reduce cost pressures.

Additional support was provided to help farmers cope with rising input costs

China provided a one-time subsidy to grain farmers to offset increasing input costs. **Colombia** increased budgetary support to the agricultural sector substantially in 2021, and reduced tariffs on agricultural inputs to zero. **India** allocated additional funds for fertiliser subsidies to offset increases in international prices, and provided assistance under the *National Mission on Oilseeds and Oil Palm* to enhance self-sufficiency in oilseeds production. **Mexico** expanded the budget allocated to its fertiliser programme by 160% in 2022 relative to levels in 2021, adding new beneficiaries from some of the poorest states in the country.

Many countries strengthened policies to improve the sustainability performance of agriculture…

Australia provided increased funding for the *Agriculture Biodiversity Stewardship Package*, which includes payments to farmers to protect, manage and enhance remnant native vegetation, the implementation of a

farm biodiversity certification scheme, and the establishment of a *National Stewardship Trading Platform* to connect farmers with buyers of biodiversity outcomes. A *National Soil Strategy* was also launched, setting out how Australia will value, manage and improve its soil resources over the next 20 years. The *Sustainability Strategy for the* ***Chilean*** *Agri-food Sector* was launched with the aim of identifying best practices for sustainable agricultural production. **Japan** developed a new Strategy for Sustainable Food Systems called MeaDRI (*Measures for Achievement of Decarbonisation and Resilience with Innovation*), which includes targets for the reduction of chemical fertiliser and pesticide applications as well as for increase of land under organic farming. **Korea** announced the *Fifth Five-Year Plan to Foster Environment-friendly Agriculture* for 2021-25.

New Zealand's *Productive and Sustainable Land Use* package financed a number of projects aiming at increased connection of farmers with other stakeholders such sector groups, regional councils and science providers. **New Zealand** also announced a ban on exports of livestock by sea to be phased in over two years, in response to animal welfare concerns about the suffering of livestock on ships. **Mexico** started phasing out the use of glyphosate and genetically-modified corn for human consumption, and announced a new strategy for reducing burning of agricultural land. The government is also developing maps of carbon sequestration potential in soils and the *Soils National Strategy for Sustainable Agriculture* for conserving, restoring and promoting sustainable soil management.

Switzerland adopted a *2030 Sustainable Development Strategy* and related action plan, with a set of objectives relating to reducing emissions from the food system, healthy and sustainable diets, reducing food loss and waste, and increasing ecosystem services. A package of measures on water quality was also adopted, including measures to reduce risks associated with pesticide use and reduce nitrogen and phosphorous losses. **Turkey** adopted its *Green Deal Action Plan*, which aims to increase the sustainability of agriculture through reductions in the use of pesticides, anti-microbials and chemical fertilisers, developing organic production, increasing renewable energy use in agriculture and improving the management of waste and residues. **Ukraine**[7] adopted a *National Action Plan for Environmental Protection until 2025*, and laws to strengthen protection of forests and peatlands, encourage large-scale afforestation, and support the development of organic farming.

The United Kingdom is phasing in new domestic support schemes as it transitions from the EU CAP. In England, support to farmers will be aimed at improving the environment, improving animal health and welfare, reducing emissions, supporting resilience to climate risks, and improving the productivity and sustainability of farm businesses. The Scottish Government's *Vision for Scottish Agriculture* outlines plans to transform support to farming and food production in Scotland and to become a global leader in sustainable and regenerative agriculture. In Wales, the proposed *Sustainable Farming Scheme* will focus on sustainable land management and food production.

The **United States** updated a number of existing programmes to increase their climate benefits. For instance, a new pilot programme was introduced under the *Environmental Quality Incentives Program* to support climate-smart agriculture and forestry through the adoption of targeted conservation practices.

…Including bolstering support for small-scale producers and fostering more inclusive development in agriculture

Costa Rica implemented the *Puente Agro Initiative*, which aims to improve productivity of small-scale farmers through the provision of equipment, inputs, and technical assistance. **Korea** developed the *Fifth Basic Plan to Support Female Farmers for 2021-25*, which aims to increase the participation of women in farming, promote the rights of female farmers and improve their quality of life. **Korea** also passed the *Act on Fostering of and Support for Next Generation Farmers or Fishers and Young Farmers or Fishers*, which will help successors and young farmers settle in rural villages, and support sustainable rural development. **South Africa** launched the *Agri-Industrial Fund* to assist black producers and entrepreneurs in developing, expanding, acquiring and integrating operations in prioritised value chains. The Fund also aims to

accelerate land redistribution and increase exports. **Ukraine** established a new *Fund for Partial Credit Guarantees in Agriculture*, providing credit guarantees to small and medium-sized farms and agricultural enterprises cultivating up to 500 hectares of land. The **United States** provided risk management education, outreach and targeted technical assistance to connect historically underserved producers with USDA programmes and services.

Risk management and disaster assistance policies were strengthened

Australia provided additional funding to develop climate information services, drought indicators for a new early warning system, and infrastructure to improve drought preparedness. **Brazil's** Ministry of Agriculture launched a digital platform (AGROMET) that compiles meteorological information and facilitates online access to different climate services related to agriculture. **Canada** boosted support through its *AgriRecovery Framework* to alleviate financial pressure on livestock farmers who faced additional costs due to drought and wildfires. **New Zealand** provided additional funding for *Rural Support Trusts and Rural Assistance Payments* to help primary producers, their families and employees cope with the adverse effects of drought and floods. **Ukraine** introduced state support for agricultural insurance, reimbursing agricultural producers with up to 60% of the cost of insurance payments. The **United States** launched a new Quality Loss Adjustment programme under the *Wildfire and Hurricane Indemnity Program Plus (WHIP+)* programme, and expanded the *Emergency Assistance for Livestock, Honey Bees and Farm-raised Fish Program* to cover feed transportation costs for drought-impacted ranches.

New laws and regulations on animal and plant health were introduced

In response to outbreaks of African Swine Fever (ASF) in the region, **Argentina's** plant and animal health and food safety body (SENASA) established the National Animal Health and Welfare Commissions for Swine and other animal species, and introduced a new regulation for swine production plants that follow standards of the World Organization for Animal Health (OIE) on compartmentalisation. **Australia** also introduced new investments in frontline biosecurity measures to manage the risk of pests and diseases entering Australia (including African Swine Fever), modernise IT systems and data analytics, and improve abilities to detect and manage threats offshore.

Chile's Agriculture and Livestock Service (SAG) updated its phytosanitary regulations, and upgraded systems for electronic certification. **Mexico** adopted new organic certification requirements for imports of organic products, including both raw and processed products. Reforms were also introduced under **Ukraine's** Association Agreement with the European Union to improve sanitary standards for the export of animal products.

Some countries provided new support to agricultural innovation and the development of human capital

Australia released the *National Agricultural Innovation Policy Statement*, establishing four new priorities for agricultural innovation that target exports, climate resilience, biosecurity and digital agriculture. The Australian Government *Roadmap to Attract, Retain, Upskill and Modernise the Agriculture Workforce* was also released, followed by several initiatives to improve employment opportunities in agriculture. **Indonesia** established *Badan Riset dan Inovasi Nasional*, a single national research and innovation agency to co-ordinate government R&D and innovation activities, including those relating to agriculture. **Korea's** Development of the Smart Agriculture Project continued in 2021 with the opening of two Smart Farm Innovation Valleys.

Many countries have concluded bilateral and regional trade agreements

The Regional Comprehensive Economic Partnership (RCEP) entered into force in January 2022, covering fifteen countries in the Asia-Pacific region including **Australia, China, Indonesia, Japan, New Zealand, the Philippines, Korea** and **Viet Nam.** The agreement will reduce tariffs on goods among the 15 participating economies by 90% over two decades from entry into force, and provides a framework for strengthening co-operation in the areas of standards, technical regulations, and conformity assessment procedures, as well as for streamlining rules of origin and border processes for perishable goods. The agreement includes significant tariff concessions for agriculture resulting in a tariff reduction of about 12.8 percentage points for about 8.4% of products, although agriculture will remain relatively more protected (17% of tariff lines remain uncommitted, versus about 5% for manufacturing) (UNCTAD, 2021[7]). The **EU-UK** Trade and Co-operation Agreement entered into force on 1 May 2021 after approval by the European Parliament and adoption by the European Council.

Several additional bilateral free trade agreements (FTAs) were negotiated or came into effect in 2021 and early 2022, helping to facilitate bilateral trade in agricultural products. These include: the **Australia-United Kingdom** FTA; EFTA-**Israel** FTA (updated with modernised and expanded bilateral agricultural agreements); **Turkey-United Kingdom** FTA; **Ukraine-Israel** FTA; **United Kingdom-Israel** FTA; **Ukraine-Turkey** FTA; EAEU-**Viet Nam**. Many other FTA negotiations are ongoing.

Trade promotion and market development policies were introduced by a number of countries

Additional funds were committed to revamp **Australia's** trade systems by simplifying regulations and establishing a one-stop shop for trade clearances. **Israel** introduced a government resolution aiming to reduce customs for agricultural fresh produce and to ease import procedures, as part of a broader set of measures.

Developments in support to agriculture

This section provides an overview on developments in policy support in agriculture, building on the OECD indicators of agricultural policy support that are comparable across countries and time. These indicators show the diversity of support measures implemented across different countries and focus on different dimensions of these policies. Definitions of the indicators used in this report are shown in Annex 2.A, while Figure 2.3 illustrates the links between, and components of, the different indicators.

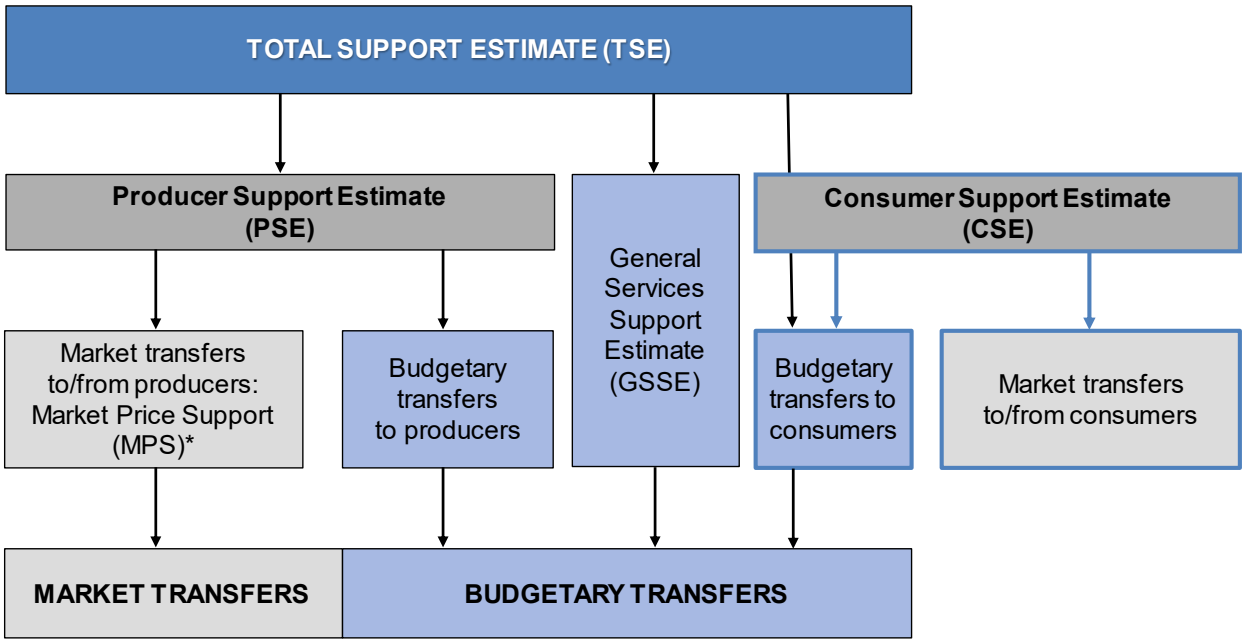
The **Total Support Estimate (TSE),** as the broadest of these indicators, combines three distinct elements: a) transfers to agricultural producers individually; b) policy expenditures for the primary agricultural sector collectively; and c) budgetary support to consumers of agricultural commodities. The TSE is expressed as a net transfer indicator, including both positive and negative elements.

The **Producer Support Estimate (PSE)** measures all transfers to agricultural producers individually. Two major types of transfers can be distinguished: ***Market Price Support (MPS)*** represents transfers from taxpayers and consumers to agricultural producers through domestic prices that are higher than their international reference prices due to domestic and trade policies (see Box 2.1). ***Budgetary support*** is financed by taxpayers only and is further broken down into various categories distinguished by the different implementation of the underlying policies. The PSE is expressed as a net transfer indicator, including both positive and negative elements.

The **General Services Support Estimate (GSSE)** measures policy expenditures that have the primary agricultural sector as the main beneficiary, but do not go to individual producers. Different types of expenditures are represented in specific categories of the GSSE.

Similar to the PSE, the **Consumer Support Estimate (CSE),** which reports support to consumers of agricultural commodities, distinguishes between market transfers that mirror the MPS, and budgetary support. To avoid double-counting, only the budgetary part of the CSE is included in the TSE.

Figure 2.3. Structure of agricultural support indicators

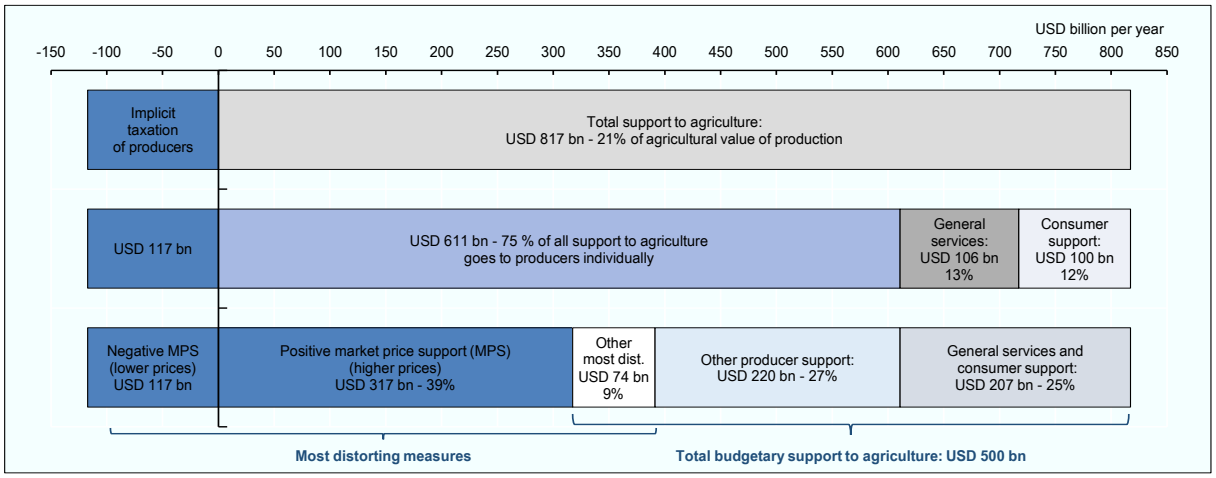


Note: *Market Price Support (MPS) is net of producer levies and excess feed cost.
Source: Annex 2.A.

Total support to agriculture has risen to record highs

Across the 54 countries covered in this report, total support directed to the sector[8] has grown to more than **USD 817 billion per year on average in 2019-2021** (Figure 2.4). A combination of temporary factors, discussed further below, was mainly responsible for a marked increase of support in 2020 and 2021. Of the total, close to USD 611 billion per year or 75% was transferred to individual producers,[9] while the remainder was almost equally split between support for general services (USD 106 billion) and budgetary transfers to consumers of agricultural products (USD 100 billion). At the same time, some emerging economies implicitly taxed their producers to the tune of USD 117 billion per year on average. The negative Market Price Support in these countries is discussed in more detail further below.

Figure 2.4. Breakdown of agricultural support, total of all countries, 2019-21

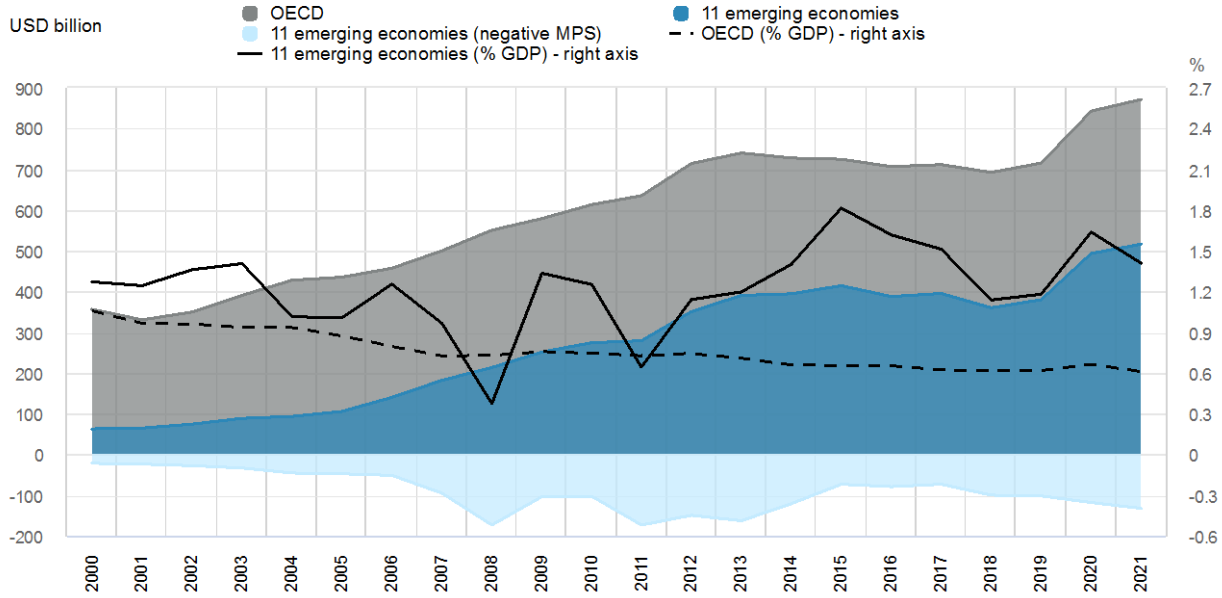


Notes: Data refer to the All countries total, including all OECD countries, non-OECD EU Member States, and the 11 emerging economies. "Implicit taxation" of producers refers to negative market price support, "General services" refers to the General services support estimate, "Consumer support" is transfers to consumers from taxpayers, "Other most dist." refers to the most distorting producer support measures other than market price support (i.e. support based on output payments and on the unconstrained use of variable inputs).
Source: based on OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

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In nominal terms, over the past 20 years, support has increased markedly within the emerging economies (Figure 2.5). This group provided USD 464 billion per year to agriculture over 2019-21, up from USD 68 billion in 2000-02, with the overwhelming majority of this support accounted for by two countries: China (USD 285 billion) and India (USD 116 billion). Agricultural support in the OECD area remained consistently high, increasing more modestly in nominal terms over the same period, to reach USD 346 billion per year in 2019-21. At USD 117 billion and USD 114 billion, a significant portion of that was provided by the European Union and the United States, respectively. Given the lower GDP and higher shares of agriculture in the economies, total support for the 11 emerging economies covered on average represents a higher, albeit fluctuating, burden to the economy than across the OECD area.

Figure 2.5. Evolution of total support to agriculture in OECD and 11 emerging economies, 2000 to 2021



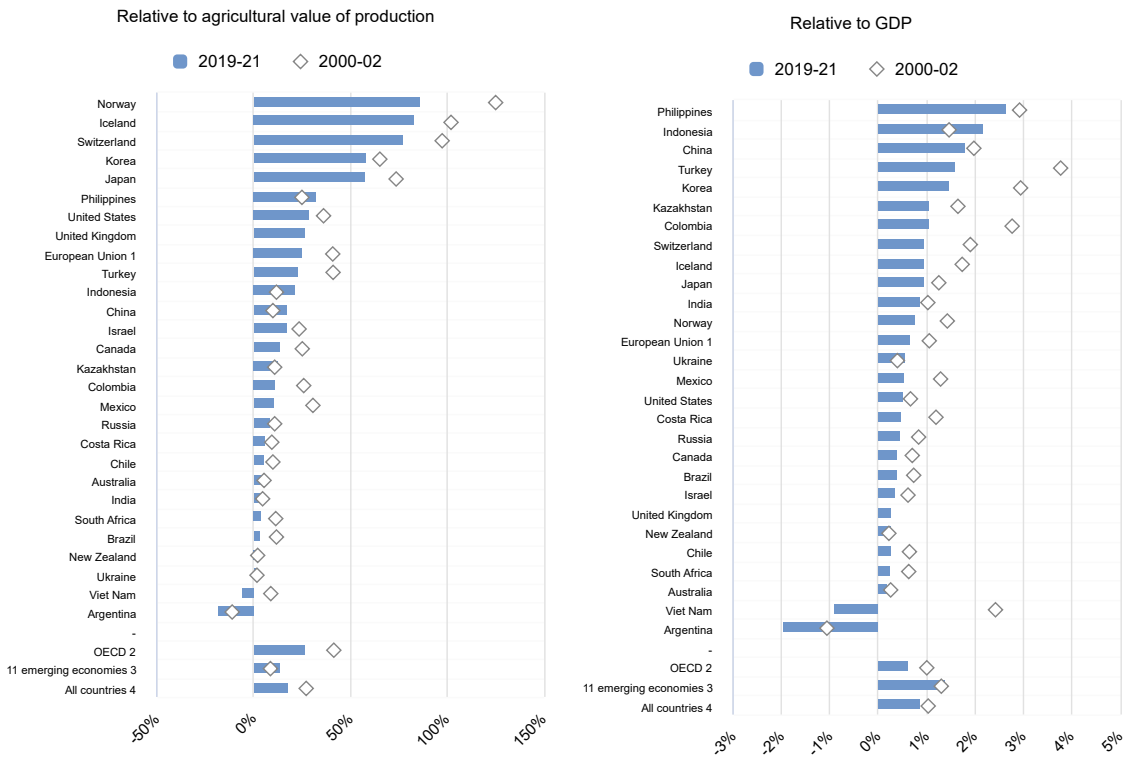
Notes: Negative MPS for OECD countries, mostly reflecting adjustments for higher feed costs due to positive MPS for feed commodities, averaged USD 461 million per year between 2000 and 2021, and is therefore too small to be visible on the graph.
The OECD total does not include the non-OECD EU Member States. Latvia and Lithuania are included only from 2004.
The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

To understand the relevance of this support for the agricultural sector, however, it is important to put these numbers into the context. For the 54 countries covered by this report, the total support provided in 2019-21 was equivalent to 18% of the production value generated by the sector. This compares to 27% of the production value of the sector in 2000-02. Across the OECD area, support as a percentage of the value of production fell from 41% to 27% over the last 20 years. Across the 11 emerging economies, it has increased in relative terms, from an equivalent of 13% in 2000-02 to 18% in the most recent years. That said, once the negative MPS in several of the emerging economies is factored in (that is, the extent to which these countries implicitly tax the sector), average net support to the sector corresponded in 2019-21 to 13.4% of its value of production (compared to 8.5% almost two decades ago).

These aggregate figures mask significant diversity across individual countries (Figure 2.6). While in Switzerland, Japan and Norway, total support added up to between 78% and 87% of national agricultural production value on average during 2019-21, net support corresponded to less than 5% of the production value in South Africa, Brazil, New Zealand and Ukraine, and was negative at -5% and -18% in Viet Nam and Argentina, respectively.

The economic burden to societies differs strongly as well. Higher support levels, lower levels of economic development and larger agricultural sectors in the economies all contribute to higher shares of agricultural support in countries' GDP (Figure 2.6, right panel), the countries with the highest economic burden of support are not always those that provide the highest level of support relative to the sector's size. Relative to GDP support is highest in the Philippines, Indonesia, China, Turkey and Korea, where support to agriculture accounts for 1.5% or more of the GDP. In Australia and South Africa, it accounts for 0.25% or less of GDP.

Figure 2.6. Total Support Estimate by country, 2000-02 and 2019-21



Notes: Countries are ranked according to TSE relative to the value of agricultural production (left panel) and relative to GDP (right panel) in 2019-21, respectively.
1. EU15 for 2000-02, EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States. Latvia and Lithuania are included only for 2019-21.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

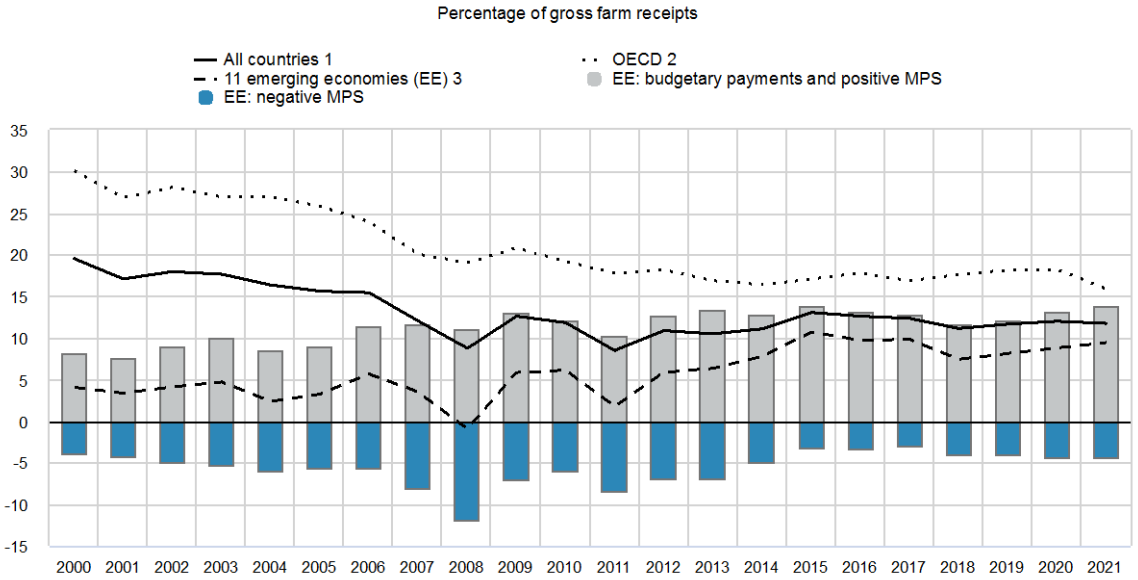
Reform to producer support has stalled in recent years

After a significant decline in support provided to individual producers within the OECD area until the early 2010s, levels of support relative to gross farm receipts (GFR) have subsequently remained largely unchanged (Figure 2.7). Overall, producer support across the 38 OECD countries stood at 17% of GFR in 2019-21 (%PSE). While preliminary data indicates that the level of market price support, and consequently of producer support overall, saw a marked decline in 2021, this is largely related to higher world market prices, not to policy reforms within the OECD.

Levels of average producer support across the emerging economies covered in this report peaked in 2015 and have changed relatively little since then. At 9% of GFR, average support is well below that of the OECD area, above the 4% reported for 2000-02 but slightly lower than the peak levels in 2015. This average figure comprises both positive and negative support to producers. In several countries, notably Argentina, India and Viet Nam, domestic and trade policies lower domestic prices of some or all commodities relative to their international reference levels. The resulting negative MPS corresponds to an implicit taxation of agricultural producers to the value of more than 4% of average GFR across all emerging economies. If the negative MPS is excluded, support to producers is represents more than 13% of GFR on average.

Across all 54 countries covered, 12% of gross farm receipts arose from some form of producer support during 2019-21, a level similar to that observed a decade earlier, and composed of almost 15% of positive support and close to 3% of implicit taxation of agricultural producers. In nominal terms, however, support to agricultural producers has reached record levels at more than USD 610 billion per year, while the implicit taxation has reached an average USD 117 billion per year, a level last seen almost a decade ago, and with an increase in the last two years.

Figure 2.7. Evolution of the % Producer Support Estimate, 2000 to 2021

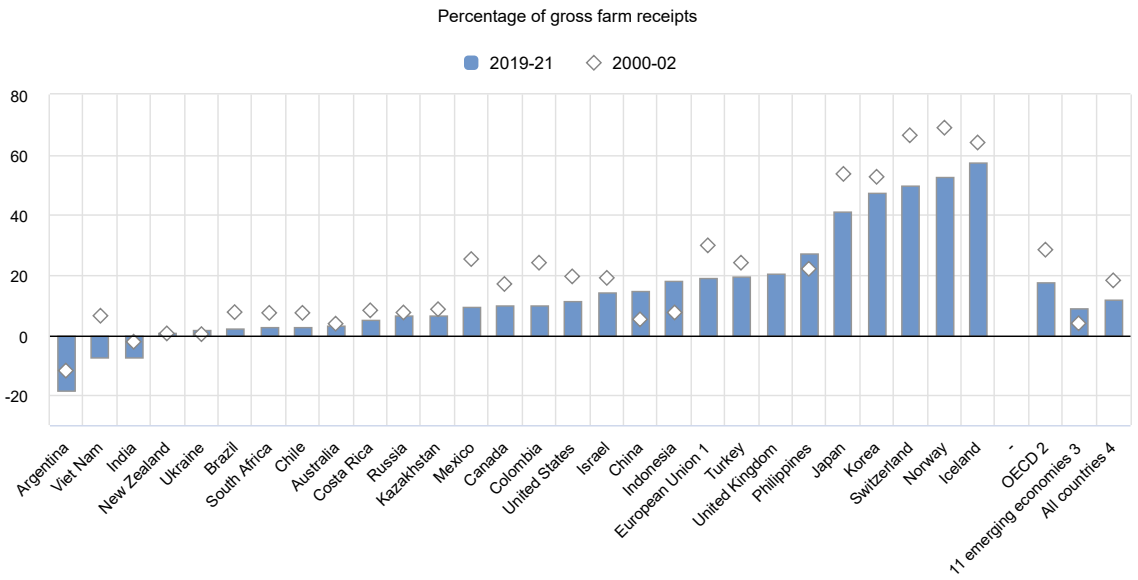


Notes: The two bars relate to the 11 emerging economies and represent a decomposition of PSE into its positive and negative parts.
1. The All countries total includes all OECD countries, non-OECD EU Member States, and the 11 emerging economies.
2. The OECD total does not include the non-OECD EU Member States. Latvia and Lithuania are included only from 2004.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Again, these average numbers mask the persistent diversity in agricultural support within both OECD countries and emerging economies (Figure 2.8). Indeed, average producer support is very low in New Zealand, Ukraine, Brazil, South Africa, Chile and Australia with levels below or close to 3% of GFR. As noted above, three countries, including Argentina, Viet Nam and India, even implicitly tax their producers by providing negative support levels. This is contrasted by Japan, Korea, Switzerland, Norway and Iceland which show PSE levels of between 40% and 57%. In other words, around half of agricultural GFR are generated from public support policies in these countries.

Among the emerging economies, only the Philippines (27%) and Indonesia (18%) show levels of producer support that exceed the OECD average. That said, most of the covered emerging economies have increased their support levels since the beginning of the century, most notably Indonesia and China, where the %PSE has risen by 11 and 10 percentage points, respectively to 18% in Indonesia and 15% in China. China's producer support saw a marked increase in 2020 and 2021, in particular in MPS and payments to producers, discussed further below.

Figure 2.8. Producer Support Estimate by country, 2000-02 and 2019-21



Notes: Countries are ranked according to the 2019-21 levels.
1. EU15 for 2000-02, EU28 for 2019, EU27 and the United Kingdom for 2020, and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States. Latvia and Lithuania are included only for 2019-21.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Market price support remains the dominant form of support in most countries

Within support to producers, significant transfers continue to be induced by policies that alter domestic market prices. Various policies contribute to higher prices, including both domestic and trade measures, but import tariffs and tariff rate quotas are the most frequently applied. Across all countries covered by this report, support through higher producer prices amounted to USD 317 billion per year on average during 2019-21, equivalent to 8% of annual GFR and more than half of all transfers to producers.

The significance of MPS varies strongly across countries. In Norway, Switzerland, the Philippines, Iceland, Japan and Korea, market price support accounts for between 20% and more than 40% of farmers' gross receipts, while these transfers to producers represent less than 5% of farmers' gross receipts in 16 other countries. In turn, three countries, Argentina, India and Viet Nam, significantly tax their producers, with their negative MPS corresponding to between -9% and -19% of gross farm receipts, respectively. This negative MPS is mostly the result of export taxes and other market and trade restrictions.

While MPS in China remains somewhat above the average across all countries at close to 11% of GFR, it saw a substantial increase in 2020 and 2021 due to: a) tighter domestic markets mainly for maize and soybeans, related to rebuilding pig herds after the outbreak of African Swine Fever, weather related problems and reduced stock releases; and b) increased minimum purchase prices for rice and wheat; and groundnuts becoming an imported product subject to border tariffs.

In addition to the diversity across countries, the average share of price support in gross farm receipts often hide significant variation across commodities within countries (Figure 2.9). Price support often remains particularly important for a subset of commodities, while being more limited, zero or even negative for others. In Korea, Switzerland, Ukraine, Japan and Iceland, MPS corresponds to between 72% and 82% of

commodity gross receipts[10] for the most strongly supported commodities.[11] Put differently, gross farm receipts for these commodities are between 3.5 and 5.6 times higher than what they would be where they priced at border reference prices (Box 2.1 provides information on the estimation of MPS).

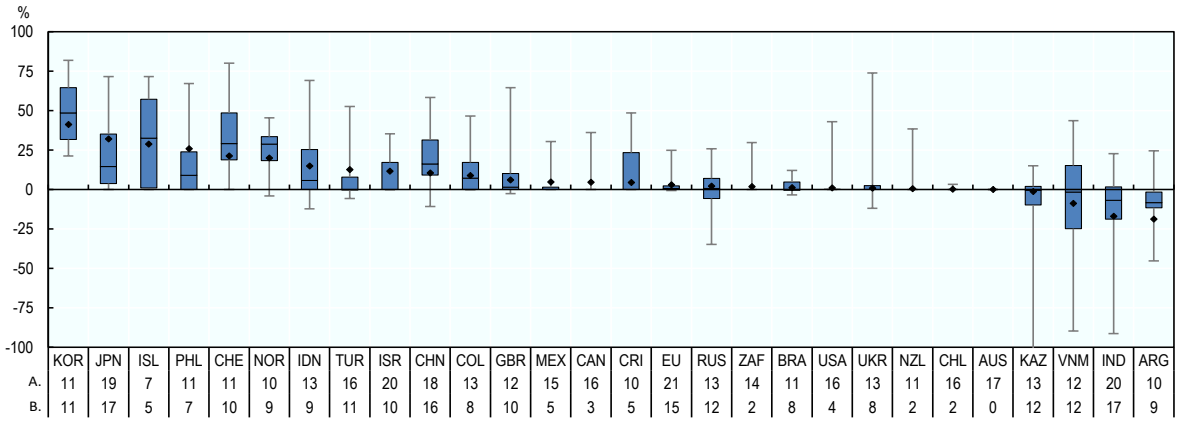
Similarly, among those countries with negative MPS, the implicit taxation noted above varies greatly. While in Viet Nam, India and Argentina, average MPS at the national level is negative at between -9% and -19% of gross farm receipts, the most heavily taxed commodities faced negative MPS worth between -45% and -91%.[12] This in effect cuts commodity gross receipts by up to half of what they would have been where they priced at reference border price levels. At the same time, each of these countries also supports the production of at least one other commodity through positive price support.

Several of the countries with small total MPS, such as Kazakhstan and Ukraine, also maintain both positive price support for some commodities and negative for others.

The low average MPS estimates therefore hide significant positive and negative support rates across commodities, stressing the importance of looking at both positive and negative components of aggregate support levels.

Figure 2.9. Relative magnitude of product-specific market price support by country, 2019-21

Percentage of commodity gross receipts



Notes: A. Number of MPS commodities. B. Number of MPS commodities with non-zero MPS values.
EU refers to EU28 for 2019, EU27 and the United Kingdom for 2020, and EU27 for 2021.
The ends of the whiskers represent the minimum and maximum values across commodities, while the boxes indicate ranges between the first and the third quartiles with the horizontal line inside indicating the median. Diamonds represent the MPS share in GFR for total agriculture.
Minimum values for Kazakhstan are -134%.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

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Box 2.1. Market price support – concept and interpretation

Market price support (MPS) is defined as the "annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level" (OECD, 2016[8]). It is calculated for individual commodities, as the gap between the domestic price paid to producers and the equivalent price at the border (market price differential, MPD), multiplied by the quantity produced, and aggregated to the national level.

This definition contains three key elements. First, it measures the transfers that arise from policy measures that create a price gap (e.g. import tariffs, minimum prices, export taxes, etc.). Second, it measures gross transfers (positive or negative) to agricultural producers from consumers and taxpayers. Third, it is measured at the farm gate level to ensure that MPS values are consistent with the production and price data for the farming sector overall.

The price gap (MPD) for a specific commodity measures the difference between two prices: the average domestic price and a reference price calculated at the same level in the value chain (generally at the farm gate). This reference price corresponds to the country's border price, i.e. the import price (for net-imported commodities) or the export price (for net-exported commodities), or in the absence of that another price indicative of them such as a world price or another country's border price, adjusted for transportation costs and any differences in quality, weight or processing level, to make them comparable to the average domestic price (see below).

The MPD is calculated only if policies exist that can cause the gap such as border measures that restrict or promote imports or exports, and government purchases, sales and intervention prices in the domestic market. If countries do not implement such policies, the MPD is assumed to be zero. A non-zero MPD, whether positive or negative, originates from price-distorting policies. It is important to note that MPS measures the "policy effort" (or level of support to prices), not the policy effect (e.g. the impact on farm income). In addition to policy instruments that restrict price transmission (say, a target price), market developments (such as exchange rate movements affecting world prices expressed in local currencies) may influence the implied policy effort and, hence, the resulting transfers.

The calculation of the MPD for individual commodities based on prices requires information not only on product prices, but also on differences in product qualities, processing and transportation margins, to compare like with like. In some cases, difficulties in identifying and obtaining relevant prices or other required information prevent the MPD calculation from being based on observed price gaps. An alternative option for calculating the MPD is the use of import tariffs or export taxes (OECD, 2016[8]), which is likely to provide accurate MPS estimates only if a uniform tariff or tax rate is the sole border measures in place.

The use of tariffs rather than price gap data comes with a number of complex measurement issues, covering issues such as the composition of product groups across tariff lines and the seasonality of production and trade. Moreover, in order to capture the marginal rather than the average import protection rate, the statutory applied MFN tariffs are used. In light of the growing number of preferential trade agreements (PTAs) engaged in by countries covered by this report, an important caveat therefore relates to the fact that the statutory applied MFN tariffs remain unchanged even when increased quantities of products are imported under preferential tariffs or duty-free within such PTAs. As a consequence, potential liberalising effects of new PTAs are not reflected in the MPS estimates when tariffs are used to calculate them. With the increased

relevance of PTAs for international trade, it therefore becomes even more important to base the MPD calculations on price gap calculations whenever data allow.

When interpreting MPS values, it is important to bear in mind that MPS is not a measure of public expenditures but an estimation of implicit or explicit transfers. MPS estimates published by the OECD therefore often differ from, and should not be confused with, those published by other organisations, including by the World Trade Organization, which may use very different concepts to calculate their indicators, despite similar names (Effland, 2011[9]; Brink, 2018[10]; OECD, 2002[11]).

Source: (OECD, 2020[12]).

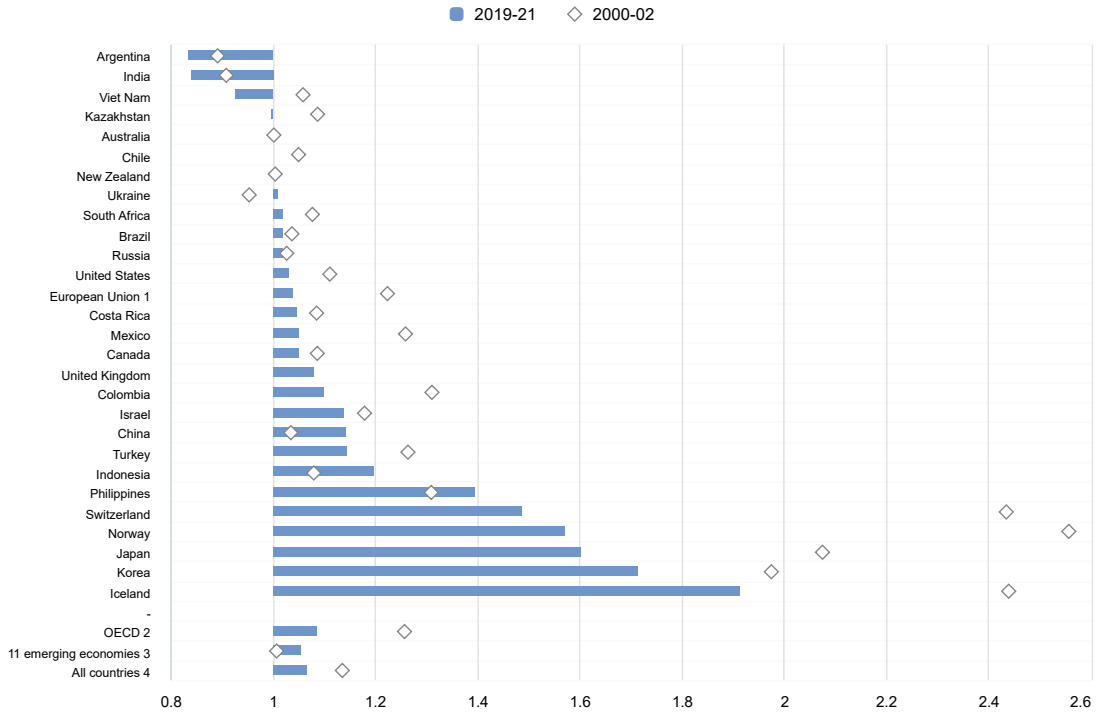
Payments provided per unit of output also form part of the effective prices received by producers, and the extent to which these effective prices differ from those on world markets is indicated by the Nominal Protection Coefficient (NPC). In many countries the gap between effective producer prices and world prices has narrowed significantly over time, suggesting that producers receive more of the signals markets provide (Figure 2.10).

On average over all OECD countries, the NPC of 1.08 indicates that effective producer prices were 8% higher than those on world markets during 2019-21, down from 26% some 20 years earlier. Progress has been particularly substantial in Norway and Switzerland, where the price gap has declined by more than 90 percentage points, but also in Iceland, Japan, Korea, Colombia and Mexico, all with price gap reductions of more than 20 percentage points.

Indeed, there is a high degree of variation amongst countries. Average effective prices during 2019-21 continued to be 40% or more above world market levels in the Philippines, Switzerland, Norway, Japan, Korea and Iceland, while they were closely aligned with world market levels in Kazakhstan, Australia, Chile, New Zealand, Ukraine, South Africa, Brazil and Russia where price gaps are below 2%.

Not all countries have seen price gaps decline. NPCs have increased by between 9 and 12 percentage points in the Philippines, China and Indonesia, so average effective producer prices in these countries have been between 14% and 40% higher than on world markets. Driven by those countries, the average price gap measured for all the emerging economies covered in this report, which was close to zero during 2000-02, has increased to almost 6% in 2019-21. That said, average effective prices in Viet Nam, India and Argentina, were below international levels by between 7% and 16% in that period.

Figure 2.10. Producer Nominal Protection Coefficient by country, 2000-02 and 2019-21



Notes: Countries are ranked according to 2019-21 levels.

1. EU15 for 2000-02, EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.

2. The OECD total does not include the non-OECD EU Member States. Latvia and Lithuania are included only for 2019-21.

3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.

4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.

Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

The majority of producer support still takes the form of the most distorting measures

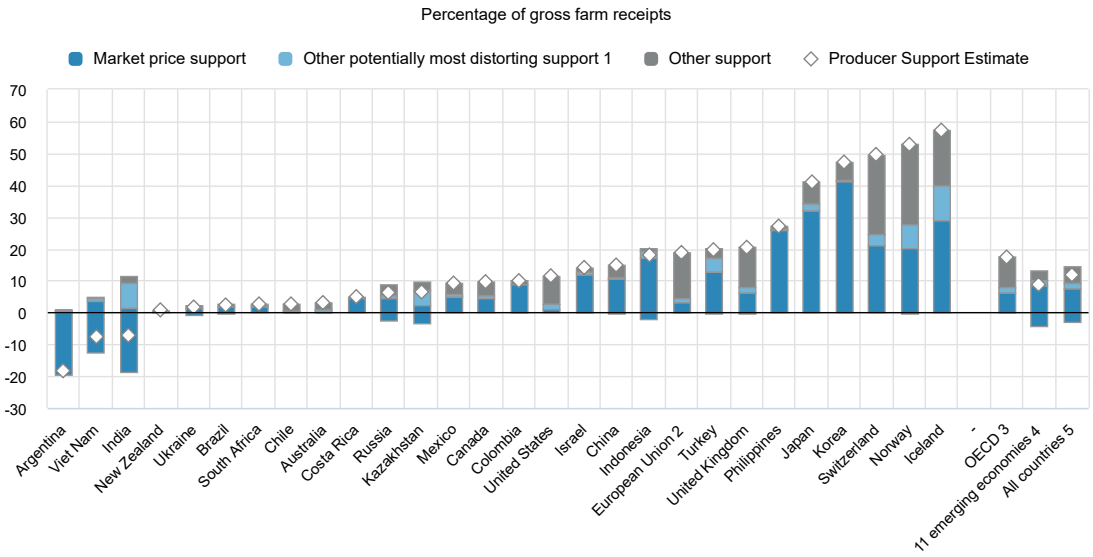
The structure of support provided to producers is as important as the overall level of support. Countries have a large portfolio of policy measures at their disposal. In addition to domestic or trade policies that raise or lower domestic market prices, and to payments provided per unit of output (which additionally raise the effective prices received by producers), governments provide subsidies that reduce producers' input costs; or payments on the basis of production area, or animal numbers; or to top up farmers' receipts or incomes. Payments can be made conditional on specific production practices, such as reduced use of production inputs that may be harmful to the environment, such as pesticides or nitrogen fertiliser, or linked directly to the supply of environmental public goods such as ecosystem services.

Past and ongoing OECD work shows that how support is provided matters for how it affects production, farm incomes and markets, but also for the performance of the agricultural sector with respect to environmental and other outcomes of social interest, such as nutrition. Market price support, and payments based on output and on the unconstrained use of variable inputs have long been identified as having the highest potential to distort production decisions and markets. More recent work has shown that these measures also have a particularly high potential to harm the environment by drawing additional resources, including natural resources, into the production process (Henderson and Lankoski, 2019[13]). In contrast, measures largely decoupled from production decisions are much more efficient in transferring income to farmer households than those that stimulate production and input use, as significant shares of the latter

transfers actually flow to the owners of purchased production factors and to producers of those inputs (OECD, 2002[14]).

Most countries still provide producer support in the most distorting forms (Figure 2.11). Across all countries, these policies account for almost three-quarters of all transfers to agricultural producers, and for more than 9% of aggregate gross farm receipts. In addition, the negative MPS in Argentina, India and Viet Nam (as well as, less significant, in a few other countries) also distorts markets in the inverse sense. On average, the share of these potentially most distorting transfers in gross farm receipts in the OECD area is slightly lower than in the 11 emerging economies, at 8% and 10%, respectively.

Figure 2.11. Potentially most distorting transfers and other support by country, 2019-21



Notes: Countries are ranked according to the %PSE levels.
1. Support based on output payments and on the unconstrained use of variable inputs.
2. EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
3. The OECD total does not include the non-OECD EU Member States.
4. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
5. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Half of producer support is tied to the production of individual commodities

Together with market price support, other forms of support are specific to individual commodities – or can be, depending on the implementation of the policy. By construction, output payments, which are paid for each unit of production, are commodity specific. Payments based on the use of inputs may be product specific, e.g. if support for fertilisers is granted only if those fertilisers are used for the production of a given commodity. Area payments are also often specific to particular commodities, but may also be defined across groups of commodities or even all crops. Similarly, headage payments can be specific to certain types of livestock, or paid for livestock groups such as beef and dairy cattle.

Support specific to individual commodities distorts production decisions as production factors and inputs are redirected from less to more supported products. Whether this distortion increases or decreases environmental pressures depends on which products are more strongly supported, as GHG emission

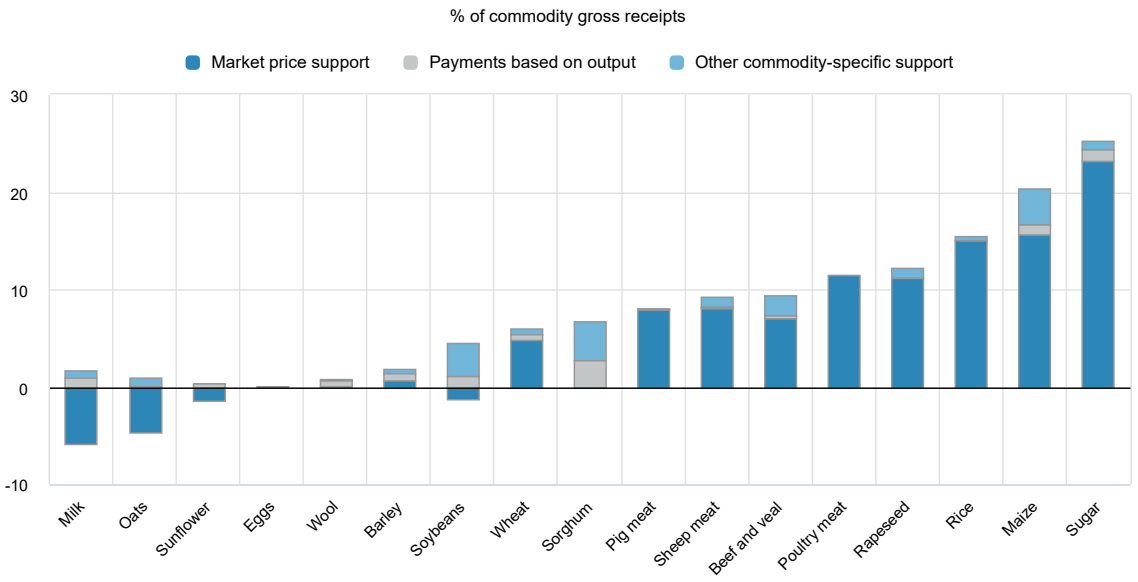
intensities and other pressures vary. They tend, for example, to be higher for livestock than for crops (although emission intensities of rice tend to be high as well) and to differ within those groups.

On average across all countries covered in this report, these single-commodity transfers (SCTs) accounted for half the support provided directly to producers, corresponding to 6% of their gross receipts, in 2019-21. Both counts are below those two decades ago, when those shares were 65% and 13%, respectively. However, while the importance of single-commodity transfers has declined across the OECD area (representing 49% of producer support and 9% of commodity gross receipts on average in 2019-21), they have gained relevance in gross receipts in a number of emerging economies (52% of producer support and 5% of commodity gross receipts on average).

SCTs are particularly high for a few products, including sugar and maize where they represent more than 20% of the respective gross receipts for these commodities. Rice also receives high support, with positive MPS and other commodity-specific support together accounting for 21% of commodity gross receipts, while negative MPS in some countries generate negative SCT worth 6%. Rapeseed and poultry meat also receive specific support worth more than 10% of their commodity gross receipts, with small negative support provided in some countries. Support for beef and veal, sheep meat, pig meat and sorghum is closer to, albeit still higher than, the average of 6.3% across all commodities. Milk, in contrast, is most strongly taxed implicitly at more than 4% of commodity receipts, as the negative MPS for milk notably in India and Argentina, corresponding to -12% of total commodity gross receipts for this commodity, more than offsets positive MPS in other countries and other product support (+8% of commodity gross receipts).

Negative SCTs are applied only in several emerging economies in the form of depressed domestic market prices (see above). Within the OECD, in contrast, SCTs are positive and reach up to 55% of commodity receipts in the case of rice, the most supported commodity in the OECD area.

Figure 2.12. Transfers to specific commodities (SCT), all countries, 2019-21



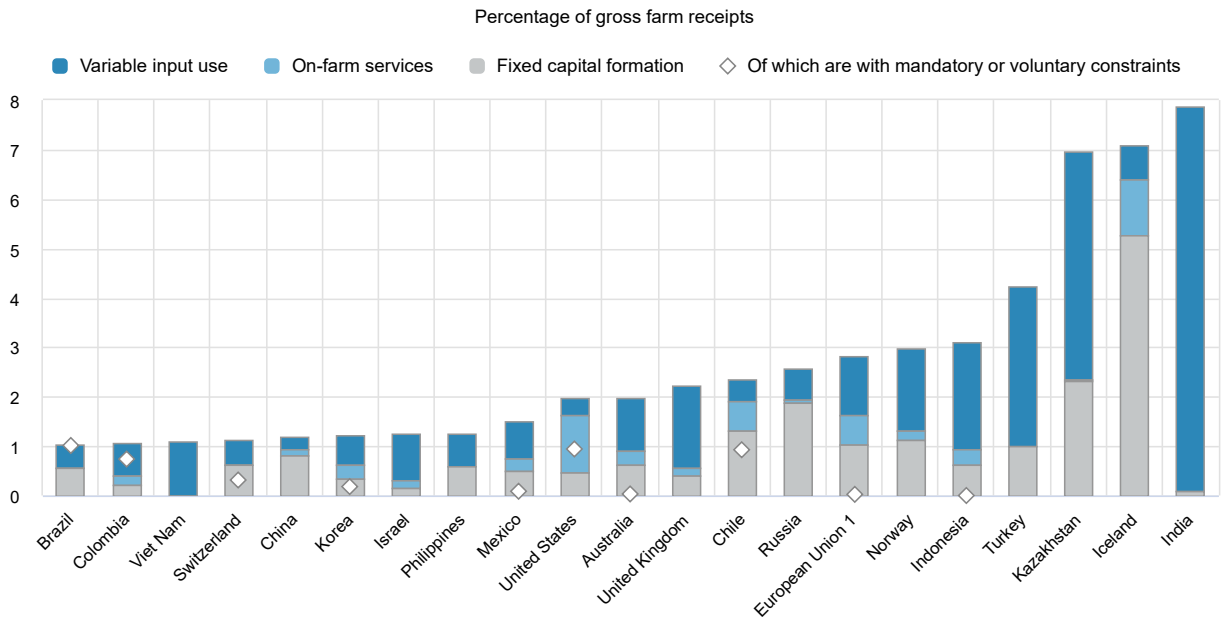
Note: Data refer to the All countries total, including all OECD countries, non-OECD EU Member States, and the 11 emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Support based on the use of production inputs is important in some countries

Next to market price support and payments based on output volumes, those related to the use of variable inputs without constraints have high potential not only to distort production decisions and trade, but also to contribute to environmental pressures, including but not limited to increased GHG emissions, by incentivising the use of those inputs beyond optimal levels. Such support for variable inputs – which include fuel and fertilisers, but also water and electricity – forms an important share of transfers to producers in a number of countries, including in particular India where they accounted for close to 8% of gross farm receipts in 2019-21. Significant support for variable inputs are also provided in Kazakhstan, Turkey, Indonesia, the United Kingdom, Norway, the European Union, Viet Nam and Australia, where it represented between 1% and 5% of GFR. Input constraints, that would reduce their distorting and environmentally harmful characteristics, apply to none or only insignificant shares of the payments in these countries.

In contrast, support related to capital investments or on-farm services typically do not distort production decisions or trade to the same extent. These types of support represent a smaller share of transfers to producers in most countries. However, capital support is the main form of input support in Iceland (more than 5% of GFR in 2019-21), Russia, Chile, Switzerland and Brazil, while in the United States, support for on-farm services is emphasised. On average, input support represents 2.2% of GFR across the OECD area and 2.5% across the 11 emerging economies covered.

Figure 2.13. Use and composition of support based on input use in selected countries, 2019-21



Notes: Figure presents countries having share of payments based on input use above 1% of gross farm receipts for 2019-21 period. Countries are ranked according to the total share of payments.
1. EU28 for 2019, EU27 and the United Kingdom for 2020, and EU27 for 2021.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Use of partly or fully decoupled payments has increased

Other types of support have become more prominent in a range of countries, where past reforms have resulted in some re-instrumentalisation. This includes payments related to production variables other than

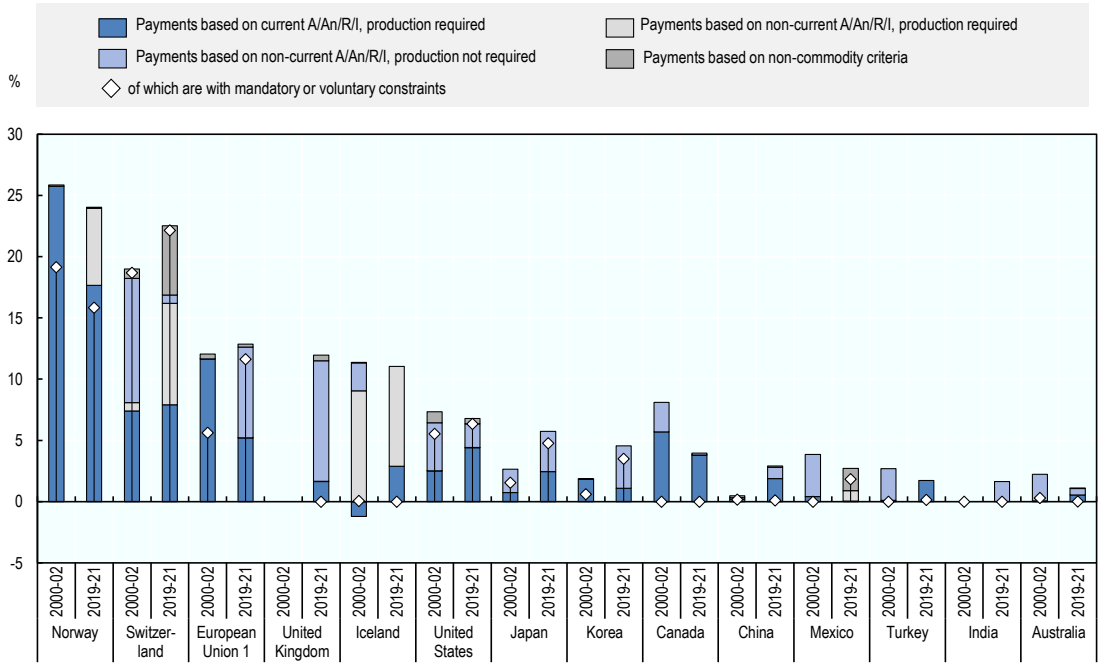
output or input use, such as payments based on area, animal numbers, revenues or incomes. Such payments may be based on current levels of those variables, or related to some historical data. If based on historical entitlements, they may or may not require recipients to actually produce. Payments may also be based on criteria unrelated to current or past commodity production, but instead be linked to long-term resource retirement or to the supply of specific non-commodity outputs, such as ecosystem services.

Across the OECD area, these less distorting payments to producers accounted for 8% of GFR in 2019-21, only slightly above the levels seen at the beginning of the century, but well above the 3.6% measured for 1986-88. This is due to reforms in several OECD countries in the context of the World Trade Organization (WTO) Agreement on Agriculture (AoA), which generated a significant reduction in market interventions in favour of area and headage payments. That said, through the first decade of this century, reforms continued, with some further decoupling of payments. While payments based on current area, animal numbers, receipts or incomes represented more than 5% of GFR two decades ago across OECD countries, this percentage has declined to less than 4% in recent years. In contrast, payments based on historical entitlements have gained importance and represented close to 4% in 2019-21, up from less than 2% two decades earlier. Most of these payments to not require production to be received, and hence do not generate any direct production incentives, thus minimising distortions.

This development is particularly visible in the European Union and Korea, where such payments had been all but inexistent in 2000-02 but represented more than 7% and 3.5% of GFR in the most recent period, respectively. In Switzerland, where such decoupled payments were important already in 2000-02, some of these have been made subject to production requirements. At the same time, however, payments for specific non-commodity outputs such as ecosystem services now represent almost 6% of Swiss farmers' gross receipts. These latter payments also exist in Norway, the European Union and the United Kingdom; but, while in the European Union these are larger than in Switzerland in absolute terms, they account for only 0.2% or less of GFR in these three regions.

Figure 2.14. Use and composition of support that is less coupled to production, selected countries, 2000-02 and 2019-21

Percentage of gross farm receipts



Notes: Figure presents countries having share of payments based on area, animal numbers, farm receipts or farm income and on non-commodity criteria above 1% for 2019-21 period. Countries are ranked according to the total share of payments for 2019-21.
1. EU15 for 2000-02, EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

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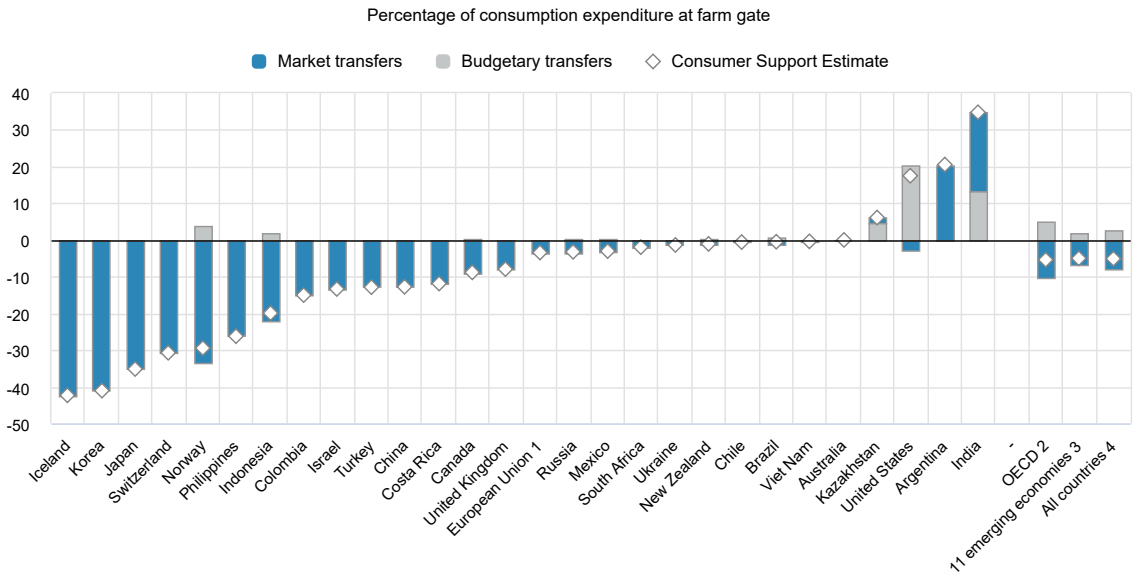
Continued market price support is financed by consumers

Consumers are affected by agricultural policies in two ways. First, they pay higher prices when MPS is positive, which effectively taxes those purchasing the products, including both the processing food industry and final consumers. Where the MPS is negative, consumers pay lower prices than what they would otherwise. Second, consumers may benefit from budgetary expenditures supporting them, either to offset the effect of a positive MPS or to provide more targeted support to poor consumers, for instance through large programmes in India and the United States.

On average across all 54 countries, agricultural policies result in a negative support to consumers, representing about -5% of their gross expenditures measured at farm gate prices (%CSE) in 2019-21. In most countries, support to consumers relative to gross expenditures at farm gate prices (%CSE) mirrors the level of market price support in the set of support measures for agricultural producers (Figure 2.15). High levels of MPS in Iceland, Korea, Japan, Switzerland, Norway, the Philippines and Indonesia result in a corresponding high taxation of consumers in these countries, corresponding to 22% of gross expenditures or more. Among these countries, Norway and Indonesia provide some budgetary support to their consumers which offset a small part of this taxation.

At the other end of the spectrum, policies in Argentina and India provide support to their consumers through depressed commodity prices. However, the significant food subsidies in India result in a particularly high %CSE of almost 35% of gross expenditures. The largest budgetary benefits accrue to food consumers in the United States, where despite their effective taxation due to some positive MPS the %CSE is at more than 15% of gross expenditures. Kazakhstan also provides food subsidies, resulting in overall consumer support of about 6% of gross expenditures.

Figure 2.15. Composition of the Consumer Support Estimate by country, 2019-21



Notes: Countries are ranked according to percentage CSE levels. A negative percentage CSE is an implicit tax on consumption.
1. EU28 for 2019, EU27 and the United Kingdom for 2020 and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Support to general services is declining in relative terms

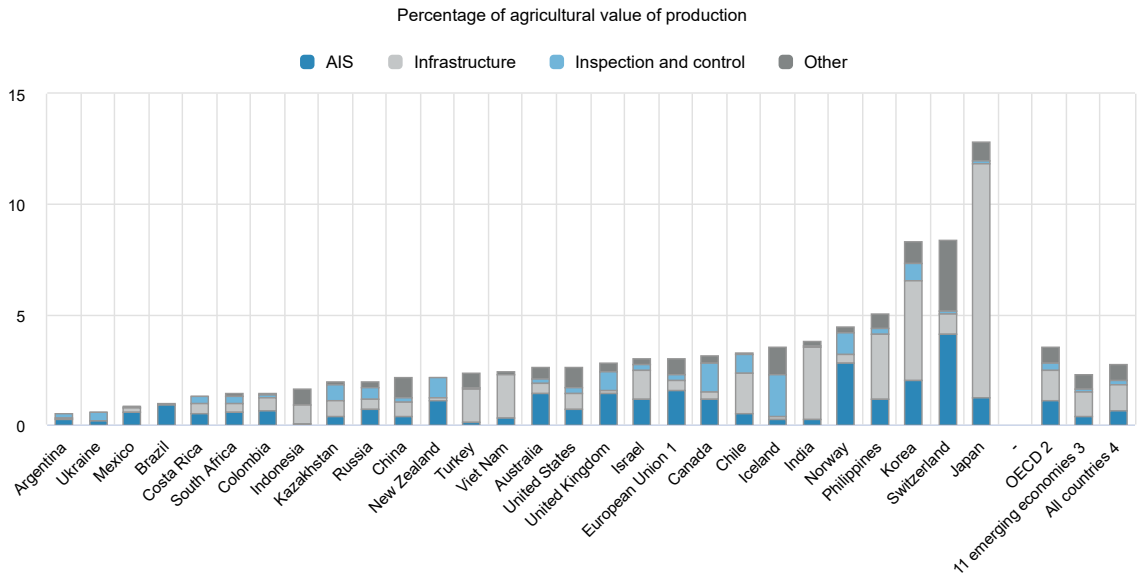
General services to the agricultural sector are forms of support that benefit agricultural producers collectively rather than individually. Across all countries covered in the report, public expenditures for general services (GSSE) have grown over the past two decades in nominal terms, but significantly less so than the sectors themselves. Relative to the value of agricultural production, support to general services has declined from 4.6% in the early 2000s to 2.7% in the most recent years. This relative decline is found both across the OECD and among emerging economies; in 2019-21, support to general services was equivalent to 3.5% of the value of production in OECD countries, and 2.3% in emerging markets. Relative to the size of the sector, general services support was particularly high in Japan, Switzerland, Korea and the Philippines where they amounted to between 5% and 13% of the value of agricultural production. Above-average support in 2019-21 is also estimated for India, Iceland, Chile, Canada, the European Union, Israel, and the United Kingdom (Figure 2.16).

Investments in general services can provide the required enabling environment for agricultural sectors to become more productive, more sustainable and more resilient. Three types of investments have a

particularly high potential for doing so, including the agricultural innovation systems, inspection and control for biosecurity services, and rural infrastructure. Investments in agricultural innovation systems include expenditures for research and development, agricultural education and training, and extension services. Appropriate and sufficiently funded biosecurity systems provide for the necessary product safety and inspection services, pest and disease control, and control and certification of the inputs used. Rural infrastructure investments comprise irrigation and drainage networks, storage and marketing facilities and institutional infrastructure, but also investments to reform farm structures. Governments also support marketing and promotion activities, as well as public stockholding.[13]

Across all countries covered in this report, investments in innovation, biosecurity and infrastructure accounted for three-quarters of all general services support – slightly less in the OECD, slightly more across the emerging economies. Priorities differ across countries, however: in half of all countries covered (including the European Union counted as one), agricultural innovation systems received the largest public support, while in nine countries, investments in rural infrastructure dominate. This in particular includes several south and south-east Asian countries where investments in irrigation infrastructure, often for the production of rice, are important. Biosecurity expenditures dominate in Iceland, Canada, Kazakhstan and Ukraine, while expenditures for public stockholding are particularly important in China.

Figure 2.16. Composition of the General Services Support Estimate, 2019-21



Notes: "AIS" refers to the Agricultural knowledge and innovation system. "Other" includes the marketing and promotion, cost of public stockholding, and miscellaneous categories of the GSSE. Countries are ranked according to the share of total GSSE in agricultural value of production.
1. EU28 for 2019, EU27 and the United Kingdom for 2020, and EU27 for 2021.
2. The OECD total does not include the non-OECD EU Member States.
3. The 11 emerging economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
4. The All countries total includes all OECD countries, non-OECD EU Member States, and the emerging economies.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

The COVID-19 pandemic has led to significant additional public expenditures for the sector

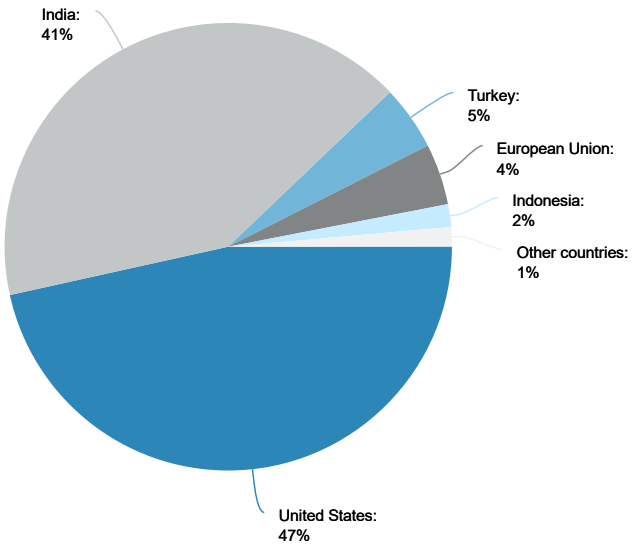
An important context for the developments in support over 2019-21 has been the COVID-19 pandemic. The following provides a preliminary assessment of the implications the COVID-19 pandemic on

government support to the agricultural sector. In contrast to earlier assessments (OECD, 2021[15]) it looks at actual expenditures rather than earmarked funds. It focuses on policy measures where a clear correspondence to relevant categories of support in the OECD database could be identified. This has two immediate implications. First, recovery and support programmes targeting beneficiaries across sectors or even the whole economy are not considered in this assessment. It therefore does not discuss all measures which may have also and among others benefited agricultural producers or consumers. Second, it was not possible to identify all COVID-19 related programmes within the OECD support database, even though qualitative information on measures in response to the pandemic is available (see country chapters), and for a number of countries, no COVID-19 related measures could be identified. As a consequence, the estimates shown should be seen as a lower bound of governments' responses in terms of agricultural support.

Overall, additional expenditures in response to the pandemic and identified within the database were significant: at USD 55.5 billion[14] in 2020 and USD 70.4 billion in 2021, they represented 7.6% and 9.4% of the aggregate Total Support Estimate for the countries covered in this report, respectively, and 10.4% and 13.2% of all the budgetary support in these years.

The distribution of this support that could be identified in the database is highly concentrated: the United States and India account for 47% and 41% of the total across both years, with most of the remainder provided by Turkey, the European Union and Indonesia.

Figure 2.17. Distribution of estimated agricultural support in response to COVID-19 by country, 2020-21



Note: Figure only covers support data from the database for which the link to COVID-19 could be identified, and may therefore exclude other support that was provided in response to the pandemic, but for which no quantification was possible.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

A key part of these expenditures was to help consumers cope with supply disruptions, regional shortages or income difficulties following job losses. In India, the totality of the measured support responding to the pandemic was through domestic food subsidies, while in the United States, some two-fifths of the additional support was through its Supplemental Nutrition Assistance Program benefiting lower-income consumers. Expenditures for domestic food assistance were also provided as a response to the pandemic in Canada, New Zealand, and the United Kingdom. In the European Union, additional funds for crisis distillation are

also included in this consumer support. Overall, consumer help represented more than three-fifths of the additional expenditures identified.

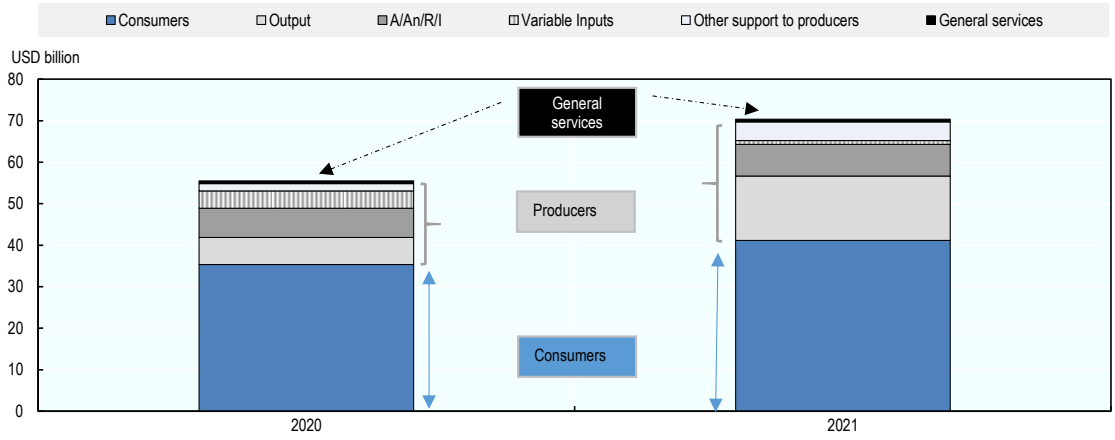
Countries also provided different forms of disaster aid in the form of income supplements or area payments to producers who were negatively affected. This includes large parts of the US Coronavirus Food Assistance Programs 1 and 2 (CFAP1 and CFAP2); crop insurance aid, different disaster crop and livestock payments in Canada, the European Union and Japan; compensation payments to herb growers in Israel; and subsidies for cows and young cattle in Ukraine. In addition, part of the CFAP1 and CFAP2 support in the United States, and support through the price stabilisation fund in Japan, was provided in the form of output payments. Overall, support provided as output payments and related to area, animal numbers, receipts or incomes, accounted for 18% and 12% of the expenditures related to the pandemic in the two years, respectively.

Variable input support has been provided in Canada, Costa Rica, Indonesia and Turkey, together amounting to 4% of the additional support recorded. Other support to producers accounts for 5% of the additional support.

Several countries provided general services support. Support in Australia, the European Union and Japan helped to keep supply chains open and supported processing and marketing activities, while some investments in storage infrastructure were made in Japan. New Zealand ramped up the budget to control wilding pines and financed a programme to control wallabies, but also invested in additional training in the context of its *Jobs for Nature* programme. Overall, however, general services accounted for just 1% of the additional expenditures identified in the context of the pandemic.

Overall, these additional funds for support to producers and consumers not only represent an important share in the TSE measured for 2020 and 2021. They also account for the majority of the growth in expenditures seen after 2019. Budgetary expenditures benefiting agricultural producers either individually or collectively, and those benefiting consumers, in 2020 and 2021 are estimated to be USD 98.5 billion and USD 101.3 billion higher than those calculated for 2019. The majority of this increase was related to measures in response to the COVID-19 pandemic.

Figure 2.18. Distribution of estimated agricultural support in response to COVID-19 by support category, 2020 and 2021



Note: A/An/R/I: Payments based on land area, animal numbers, receipts or income. Figure only covers support data from the database for which the link to COVID-19 could be identified, and may therefore exclude other support that was provided in response to the pandemic, but for which no quantification was possible
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en

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Summary and conclusion: Reforming agricultural support for better addressing public objectives

Government intervention and support to the agricultural sector is often aimed at addressing the triple challenge facing the food systems: ensuring food security and nutrition for growing global population, providing livelihoods to farmers and others along the food chain, and using natural resources sustainably while reducing greenhouse gas (GHG) emissions. While major achievements have been made on all three dimensions, significant problems remain as malnutrition persists, farmers are under pressure to adjust, and natural resource pressures remain high.[15]

Progress in reforming agricultural policies and reducing support has stalled

Across the 54 countries covered in this report, for 2019-21, agricultural policies generated USD 817 billion per year in transfers towards agriculture, more than twice the volume of transfers registered for 2000-02 but about a quarter less when expressed relative to the value of agricultural production. Three-quarters of this total, USD 611 billion, was transferred to individual producers, both through higher prices and through payments. In turn, some countries implicitly tax their producers through policies that depress domestic market prices.

The net support to the sector (total support estimate or TSE), representing USD 700 billion per year, costs the economy some 0.9% of combined GDP across all countries covered in this report, a slight decline from 1.0% during 2000-02, partly reflecting the smaller economic weight of the sector.

In spite of strong increase in nominal terms, producer support as a share of gross farm receipts (%PSE) has declined for much of the past two decades and in 2019-21 averaged 12% across the 54 countries, down from more than 18% at the beginning of the century. Within the OECD, producer support declined from 28% of gross farm receipts (GFR) in 2000-02 to 17% in 2019-21. Most of this decline has happened in the 2000s, while progress in reducing support has been limited in recent years. While lower than the OECD average, support to producers more than doubled from 3.8% to 8.8% during the same period in the 11 emerging economies represented in this report.

Market price support continues to represent a major part of support to agricultural producers in many countries. Totalling to USD 317 billion per year, average positive market price support represented 7.6% of the combined GFR during 2019-21. At the same time, several countries have implemented policies that suppress market prices, generating an implicit taxation worth USD 117 billion per year away from producers, corresponding to 2.8% of combined GFR.

In addition to market price support, governments provide payments to farmers that differ in terms of the specific implementation and conditions for receiving them. USD 74 billion per year were provided as payments either on the basis of output quantities or linked to the unconstrained use of variable inputs. Together with the positive price support, a total of USD 391 billion per year was thus transferred to producers in the potentially most distorting forms.

Other payments are less coupled to production decisions and amounted to USD 220 billion per year during 2019-21. Of this, USD 81 billion were linked to historical rather than current production parameters and hence have no direct link to current production decisions at all. However, only USD 1.7 billion of payments to producers were conditional on the provision of well-defined public goods, including ecosystem services.

In addition to support to producers individually, governments provide support for the sector as a whole. This “general services support” (GSSE) amounted to USD 106 billion per year in 2019-21 or 21% of budgetary support to the sector. Relative to the sector’s size, this represented 2.7% of its aggregate value of production, a significant decline from the 4.6% measured for 2000-02. In particular, this total includes investments in public goods for the sector, such as the agricultural knowledge and innovation system, off-farm infrastructure and biosecurity services, which received a combined USD 80 billion per year. However,

it also includes support with a potential to distort markets, such as aid for marketing and promotion activities and support for public stockholding (USD 24 billion).

Finally, subsidies for consumers, including for food assistance programmes, averaged USD 100 billion per year in 2019-21 and hence represented 20% of all budgetary support. On average, however, consumers were still taxed by agricultural policies, as these subsidies were smaller than the increase in food expenditures due to persistent market price support in many countries.

Within both country groups, there is significant variation in support levels across countries. On average during 2019-21, levels of producer support ranged from about 3% of GFR or less in New Zealand, Ukraine, Brazil, South Africa, Chile and Australia, to between 40% and almost 60% in Japan, Korea, Switzerland, Norway and Iceland. Net producer support was negative in Argentina, Viet Nam and India.

The COVID-19 pandemic has led to a significant increase in expenditures for the sector

In response to the COVID-19 pandemic, governments have implemented additional measures to keep food supply chains functioning, help producers cope with disruptions and provide additional food aid to poor consumers. Available data suggests that this additional support represented a substantial share of total support provided to the sector.

In 2020 and 2021, governments spent an extra USD 55 billion and USD 70 billion, respectively, representing 10% and 13% of all budgetary support in these years. This estimate is likely a lower bound of actual extra expenditures, as it includes only support for which the link to the pandemic could be clearly identified.

The majority of these funds, or 61%, targeted consumers who needed to cope with supply disruptions or income difficulties following job losses. Such emergency help was among the temporary relief measures identified in (OECD, 2021[15]) which should include sunset clauses. In the longer run, structural measures to help consumers increase their purchasing power might be available to increase their resilience against market shocks.

Countries also provided emergency assistance to agricultural producers, often directly or indirectly based on income or revenue losses incurred. Indeed, 38% of the additional funds went to agricultural producers who suffered losses of revenues, faced shortages of seasonal workers or difficulties in input supplies. However, in some cases this additional support was provided on the basis of output or the use of variable inputs, thus adding to the group of potentially most distorting and environmentally harmful support. The remaining 1% was used to help the functioning of supply chains.

Much of current support to the sector has negative implications for its performance

Both positive market price support and the implicit taxation of producers in some countries have increased, and averaged USD 317 billion and USD 117 billion per year in 2019-21, respectively. Both have negative implications for global food security as they hamper the efficient allocation of resources and weaken the balancing role of trade in ensuring the necessary product flows from surplus to deficit regions. Constraining trade also contributes to increasing price volatility on international markets. Moreover, some countries have imposed additional export restrictions in response to the COVID-19 pandemic, often aiming to improve the domestic supply situation.

Market price support as well as payments linked to output or to the unconstrained use of variable inputs have been identified as the potentially most distorting support, which now amounts to USD 391 billion per year. Such support is inefficient in transferring income to producers, as a large share of the transfers are leaked in the form of higher prices for and larger use of inputs, or capitalised into land values. As this support is tied to production, it also tends to be inequitable by benefiting larger producers most. Moreover, the incentive to increase production and input use may contribute to higher resource pressures.

Other forms of producer support, amounting to USD 220 billion per year in 2019-21, create lower distortions at the margin and hence have less adverse effects for global food security. Given the less pronounced distortions of producer incentives, they also contribute less to pressures on natural resources. Moreover, while such support may still be inequitably distributed, their efficiency in transferring incomes to producers is significantly higher due to lower leakage to input suppliers and non-farm landowners. However, few of the payments to farmers are based on assessed needs of farm households based on their overall income from all sources.

As part of this more decoupled farm support, the amount of transfers linked directly to the provision of environmental goods has increased to USD 1.7 billion per year. However, this remains a small fraction of the USD 293 billion of budgetary support to producers and continues to be limited to a small number of countries.

In addition to these payments to producers, a number of other instruments have potentially significant positive effects on all three aspects of the triple challenge as they makes important contributions to food security, farm incomes and resource protection. These fall within the category of general services for the agricultural sector (GSSE), and particularly include investments in agricultural knowledge and innovation systems, inspection and control for biosecurity services, and infrastructure. Together, expenditures for general services have increased to USD 106 billion per year. While this increase is laudable, it falls short of increases in support with less potential to positively impact on the performance of the food systems. In 2019-21, expenditures for general services represented just 15.2% of total net support to the sector (TSE), down from some 17% during 2000-02. Within the OECD, this share was lower still at only 13% in recent years. More importantly, the increase in the support to general services strongly declined relative to the size of the sector, from 3.6% of its value of production in 2000-02 to 2.3% in 2019-21 across all countries covered in this report. Agricultural knowledge and innovation systems received just USD 26 billion of that (0.7% of the sector's production value, down from 0.9% in the early 2000s), despite evidence of high returns of such investments, and expenditures for biosecurity services and infrastructure accounted for USD 9 billion and USD 45 billion per year (0.2% and 1.2% of the agricultural production value), respectively.

Countries should reinvigorate reform ambitions aiming to better address the challenges facing the sector

Across the OECD, agricultural policies have undergone significant changes which have both reduced overall support to producers and changed the way this support is provided. Put together, the types of support with the strongest potential to distort markets and to harm the environment have been reduced and partly replaced by payments that have higher income transfer efficiencies and add less to environmental pressures, or that incentivise the supply of ecosystem services and other public goods. A larger share of producer support has also been linked to stricter environmental constraints, thus lifting the reference levels for agricultural practices and limiting the overuse of natural resources.

That said, the pace of such reforms has slowed down significantly, and little further progress has been observed in the OECD area over the past decade. Together with the increase in potentially harmful support in a number of emerging economies, renewed efforts are therefore required to better align agricultural policies and support to the sector's needs in light of the ongoing triple-challenge of food and nutrition security, incomes and livelihoods, and the sustainable use of natural resources. Boosting sustainable productivity growth and improving resilience in agriculture remain key levers for addressing all three challenges and should therefore be central to future reform ambitions.

These reforms should target the reduction of potentially negative effects of current support, an acceleration of investments in public goods, and improved and more targeted efforts to help farm households in need.

Price interventions and other market distorting support are known for their negative implications for food security and the environment, and for being both inefficient and untargeted to providing support to those households in need. These policies should therefore be phased out over a well-defined timeline. Accompanying and transitional assistance and social safety nets may be needed to buffer the income loss implied for some of the producers by the removal of positive price support and associated trade protection, and to help them adjust to the new policy environment. Conversely, targeted income transfers and strengthened safety nets may be required to help low-income households and consumers suffering higher domestic prices due to the removal of price-depressing policies in some countries.

Public expenditures should be re-oriented towards investments in public goods and services that can improve both the sustainability and the resilience of the sector. Innovation is essential for improving the environmental sustainability while fostering productivity growth. Public investments should therefore prioritise the agricultural innovation system, which includes the development and adoption of new technologies, practices and systems. Public research and development as well as public-private partnerships need to complement private investments while allowing a demand driven innovation process. The market and policy environment should send clear signals of the environmental priorities to steer the innovation system towards sustainable productivity growth. Investments on knowledge and skills, including digital skills, can foster the synergies between the digital and environmental transformation of the sector. These investments currently represent only a small share of budgetary support to the sector, but should be made both central to it and better targeted to innovations that link productivity growth to the reduced use of natural resources. Investments in biosecurity systems and off-farm infrastructure are also key for the sector's performance. Investments in these three areas could be increased significantly by redirecting market distorting payments.

Well-defined safety nets can contribute to sector resilience in a world of diverse systemic risks that go beyond natural disasters and include the consequences of the COVID-19 pandemic and Russia's large-scale aggression against Ukraine. Investments that can contribute to improved resilience also include training and skills for risk management, data and evidence based risk assessments, climate and disaster-proof infrastructures and an improved diversification of farm households' income sources. Finally, agriculture continues to be faced by numerous uncertainties and risks. Agricultural policies have an important role to play in ensuring that producers and other market participants have access to data and tools required to manage small and medium-size risks. However, there will also a continued need to cover large-scale risks that cannot be covered by farmers themselves or by risk markets.

Given their role for the maintenance and care of much of countries' land area, a significant contribution can be made by farmers in providing public goods, including ecosystem services and other environmental benefits of value to the society. Governments should consider increasing targeted and tailored payments to producers to facilitate the supply of such public goods, while at the same time generating additional income opportunities to farm households.

A significant share of current support aims at supporting low-income farm households, but predominantly benefits those that enjoy comparatively high income and wealth due to their larger size. Income support should be better targeted to those in need, which would improve both efficiency of public fund use and the equity of their distribution. However, data on the wealth and total incomes of farm households, which would already benefit from payments for the supply of public goods, will need to be collected more systematically to provide the basis for such targeted support.

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Notes

[1] This report does not contain a country chapter on the Russian Federation, nor any tables with support indicators in the Statistical Annex. However, aggregate data for the 11 emerging economies and for all 54 countries covered in this report continue to include those for Russia.

[2] Publicly supported short-time work schemes allow companies to temporarily reduce the work time of employees by up to 100%, while wage differences are partly or fully subsidised by the government.

[3] October-September Marketing Year.

[4] AMIS Market Monitor, April 2022, http://www.amis-outlook.org/amis-monitoring/monthly-report/en/#.YlPZDMhBwuU.

[5] https://blogs.worldbank.org/opendata/fertilizer-prices-expected-remain-higher-longer.

[6] Examples of policy responses reported here are taken from the AMIS Market Monitor, April 2022, different media reports and government websites.

[7] The Russian large scale aggression against Ukraine, briefly discussed in the previous section, has created a significant change in the landscape of agricultural policies in Ukraine. The material on Ukraine in this section is based on information collected prior to the Russian aggression against Ukraine and has to a large extent been overtaken by recent events. The policy developments in Ukraine outlined in this section will therefore need to be understood against this background.

[8] Corresponding to the positive part of the Total Support Estimate (TSE).

[9] Corresponding to the positive part of the Producer Support Estimate (PSE).

[10] Commodity gross receipts include the commodity-specific value of production, valued at farm gate prices, plus any single-commodity transfers other than the MPS.

[11] For the countries listed, these commodities are soybeans (Korea), poultry meat (Switzerland and Iceland), sugar (Ukraine) and grapes (Japan).

[12] For the countries listed, these commodities are tea (Viet Nam), bananas (India) and soybeans (Argentina).

[13] These cover the cost of storage or disposal of agricultural commodities, as well as their depreciation.

[14] This compares to a total of USD 157 billion originally earmarked for COVID-19 related support (OECD, 2021[15]).

[15] The 2021 edition of the *OECD Agricultural Policy Monitoring and Evaluation* (OECD, 2021[15]) has highlighted that, overall, most current support policies are not serving the wider needs of food systems. This section complements the assessment made in Chapter 1 of that report by looking at the support provided in recent years.

Annex 2.A. Definition of OECD indicators of agricultural support

Nominal indicators used in this report

Producer Support Estimate (PSE): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. It includes market price support, budgetary payments and budget revenue foregone, i.e. gross transfers from consumers and taxpayers to agricultural producers arising from policy measures based on: current output, input use, area planted/animal numbers/receipts/incomes (current, non-current), and non-commodity criteria. PSE categories are defined in Box 2 A.1.

Market Price Support (MPS): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level. MPS is available by commodity, and sums of negative and positive components are reported separately where relevant along with the total MPS.

Producer Single Commodity Transfers (producer SCT): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the payment. This includes broader policies where transfers are specified on a per-commodity basis. Producer SCT is also available by commodity.

Group Commodity Transfers (GCT): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies whose payments are made on the basis that one or more of a designated list of commodities is produced, i.e. a producer may produce from a set of allowable commodities and receive a transfer that does not vary with respect to this decision.

All Commodity Transfers (ACT): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies that place no restrictions on the commodity produced but require the recipient to produce some commodity of their choice.

Other Transfers to Producers (OTP): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies that do not require any commodity production at all.

Consumer Single Commodity Transfers (consumer SCT): The annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policies linked to the production of a single commodity. Consumer SCT is also available by commodity.

Consumer Support Estimate (CSE): The annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. If negative, the CSE measures the burden (implicit tax) on consumers through market price support (higher prices), that more than offsets consumer subsidies that lower prices to consumers.

General Services Support Estimate (GSSE): The annual monetary value of gross transfers arising from policy measures that create enabling conditions for the primary agricultural sector through development of private or public services, institutions and infrastructure, regardless of their objectives and impacts on farm production and income, or consumption of farm products. The GSSE includes policies where primary agriculture is the main beneficiary, but does not include any payments to individual producers. GSSE transfers do not directly alter producer receipts or costs or consumption expenditures. GSSE categories are defined below.

Total Support Estimate (TSE): The annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Total Budgetary Support Estimate (TBSE): The annual monetary value of all gross budgetary transfers from taxpayers arising from policy measures that support agriculture, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Gross Farm Receipts (GFR): The annual monetary value of production, to which budgetary transfers to individual producers are added (i.e. VP + PSE – MPS).

Commodity Gross Receipts: The annual monetary value of production for an individual commodity, to which budgetary transfers to producers of that commodity are added (i.e. VP + producer SCT – MPS).

Ratio indicators and percentage indicators

Percentage PSE (%PSE): PSE transfers as a share of gross farm receipts (including support in the denominator).

Percentage SCT (%SCT): Single Commodity Transfers as a share of gross receipts for the specific commodity (including support in the denominator).

Share of SCT in total PSE (%): Share of Single Commodity Transfers in the total PSE. This indicator is also calculated by commodity.

Producer Nominal Protection Coefficient (producer NPC): The ratio between the average price received by producers (at farm gate), including payments per tonne of current output, and the border price (measured at farm gate). The Producer NPC is also available by commodity.

Producer Nominal Assistance Coefficient (producer NAC): The ratio between the value of gross farm receipts including support and gross farm receipts (at farm gate) valued at border prices (measured at farm gate).

Percentage CSE (%CSE): CSE transfers as a share of consumption expenditure on agricultural commodities (at farm gate prices), net of taxpayer transfers to consumers. The %CSE measures the implicit tax (or subsidy, if CSE is positive) placed on consumers by agricultural price policies.

Consumer Nominal Protection Coefficient (consumer NPC): The ratio between the average price paid by consumers (at farm gate) and the border price (measured at farm gate). The Consumer NPC is also available by commodity.

Consumer Nominal Assistance Coefficient (consumer NAC): The ratio between the value of consumption expenditure on agricultural commodities (at farm gate) and that valued at border prices.

Percentage TSE (%TSE): TSE transfers as a percentage of GDP.

Percentage TBSE (%TBSE): TBSE transfers as a percentage of GDP.

Percentage GSSE (%GSSE): Share of expenditures on general services in the Total Support Estimate (TSE).

Share of potentially most distorting transfers in aggregated gross producer transfers (%): represents the sum of positive MPS, the absolute value of negative MPS, payments based on output and payments based on unconstrained use of variable inputs, relative to the sum of positive MPS, the absolute value of negative MPS, and all budgetary payments to producers.

Annex Box 2.A.1. Definitions of categories in the PSE classification

Definitions of categories

Category A1, Market price support (MPS): Transfers from consumers and taxpayers to agricultural producers from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.

Category A2, Payments based on output: Transfers from taxpayers to agricultural producers from policy measures based on current output of a specific agricultural commodity.

Category B, Payments based on input use: Transfers from taxpayers to agricultural producers arising from policy measures based on on-farm use of inputs:

- ***Variable input use*** that reduces the on-farm cost of a specific variable input or a mix of variable inputs.
- ***Fixed capital formation*** that reduces the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage, and soil improvements.
- ***On-farm services*** that reduce the cost of technical, accounting, commercial, sanitary and phytosanitary assistance and training provided to individual farmers.

Category C, Payments based on current A/An/R/I, production required: Transfers from taxpayers to agricultural producers arising from policy measures based on current area, animal numbers, revenue, or income, and requiring production.

Category D, Payments based on non-current A/An/R/I, production required: Transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, revenue, or income, with current production of any commodity required.

Category E, Payments based on non-current A/An/R/I, production not required: Transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, revenue, or income, with current production of any commodity not required but optional.

Category F, Payments based on non-commodity criteria: Transfers from taxpayers to agricultural producers arising from policy measures based on:

- ***Long-term resource retirement:*** Transfers for the long-term retirement of factors of production from commodity production. The payments in this subcategory are distinguished from those requiring short-term resource retirement, which are based on commodity production criteria.
- ***A specific non-commodity output:*** Transfers for the use of farm resources to produce specific non-commodity outputs of goods and services, which are not required by regulations.
- ***Other non-commodity criteria:*** Transfers provided equally to all farmers, such as a flat rate or lump sum payment.

Category G, Miscellaneous payments: Transfers from taxpayers to farmers for which there is a lack of information to allocate them among the appropriate categories.

Note: A (area), An (animal numbers), R (receipts) or I (income).

Definitions of labels

With or without current commodity production limits and/or limit to payments: Defines whether or not there is a specific limitation on current commodity production (output) associated with a policy providing transfers to agriculture and whether or not there are limits to payments in the form of limits to area or animal numbers eligible for those payments. Applied in categories A–F.

With variable or fixed payment rates: Any payments is defined as subject to a variable rate where the formula determining the level of payment is triggered by a change in price, yield, net revenue or income or a change in production cost. Applied in categories A–E.

With or without input constraints: defines whether or not there are specific requirements concerning farming practices related to the programme in terms of the reduction, replacement, or withdrawal in the use of inputs or a restriction of farming practices allowed. Applied in categories A–F. The payments with input constrains are further broken down to:

- Payments conditional on compliance with basic requirements that are mandatory (with mandatory);
- Payments requiring specific practices going beyond basic requirements and voluntary (with voluntary).
  - Specific practices related to environmental issues.
  - Specific practices related to animal welfare.
  - Other specific practices.

With or without commodity exceptions: defines whether or not there are prohibitions upon the production of certain commodities as a condition of eligibility for payments based on non-current A/An/R/I of commodity(ies). Applied in Category E.

Based on area, animal numbers, receipts or income: defines the specific attribute (i.e. area, animal numbers, receipts or income) on which the payment is based. Applied in categories C–E.

Based on a single commodity, a group of commodities or all commodities: defines whether the payment is granted for production of a single commodity, a group of commodities or all commodities. Applied in categories A–D.

Drivers of the change in PSE

Decomposition of PSE

***Per cent change in PSE*:** Per cent change in the nominal value of the PSE expressed in national currency. The per cent change is calculated using the two most recent years in the series.

***Contribution of MPS to per cent change in PSE*:** Per cent change in nominal PSE if all variables other than MPS are held constant.

***Contribution of price gap to per cent change in the PSE*:** Per cent change in nominal PSE if all variables other than gap between domestic market prices and border prices are held constant.

***Contribution of quantity produced to per cent change in the PSE*:** Per cent change in nominal PSE if all variables other than quantity produced are held constant.

***Contribution of budgetary payments (BP) to per cent change in PSE*:** Per cent change in nominal PSE if all variables other than BP are held constant.

***Contribution of BP elements to per cent change in PSE*:** Per cent change in nominal PSE if all variables other than a given BP element are held constant. BP elements include Payments based on output, Payments based on input use, Payments based on current A/An/R/I, production required, Payments based on non-current A/An/R/I, production required, Payments based on non-current A/An/R/I, production not required, Payments based on non-commodity criteria and Miscellaneous payments.

Change in Producer Price

***Per cent change in Producer Price*:** Per cent change in Producer Price (at farm gate) expressed in national currency. The per cent change is calculated using the two most recent years in the series.

Decomposition of the change in the Border Price

***Per cent change in Border Price*:** Per cent change in Border Price (at farm gate) expressed in national currency. The per cent change is calculated using the two most recent years in the series.

***Contribution of Exchange Rate to per cent change in Border Price*:** Per cent change in the Border Price (at farm gate) expressed in national currency if all variables other than Exchange Rate between national currency and USD are held constant.

***Contribution of Border Price expressed in USD to per cent change in Border Price*:** Per cent change in the Border Price (at farm gate) expressed in national currency if all variables other than Border Price (at farm gate) expressed in USD are held constant.

Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.

Definition of GSSE categories

Agricultural knowledge and innovation system

- ***Agricultural knowledge generation***: Budgetary expenditure financing research and development (R&D) activities related to agriculture, and associated data dissemination, irrespective of the institution (private or public, ministry, university, research centre or producer groups) where they take place, the nature of research (scientific, institutional, etc.), or its purpose.
- ***Agricultural knowledge transfer***: Budgetary expenditure financing agricultural vocational schools and agricultural programmes in high-level education, training and advice to farmers that is generic (e.g. accounting rules, pesticide application), not specific to individual situations, and data collection and information dissemination networks related to agricultural production and marketing.

Inspection and control

- ***Agricultural product safety and inspection***: Budgetary expenditure financing activities related to agricultural product safety and inspection. This includes only expenditures on inspection of domestically produced commodities at first level of processing and border inspection for exported commodities.

- ***Pest and disease inspection and control:*** Budgetary expenditure financing pest and disease control of agricultural inputs and outputs (control at primary agriculture level) and public funding of veterinary services (for the farming sector) and phytosanitary services.
- ***Input control:*** Budgetary expenditure financing the institutions providing control activities and certification of industrial inputs used in agriculture (e.g. machinery, industrial fertilisers, pesticides, etc.) and biological inputs (e.g. seed certification and control).

Development and maintenance of infrastructure

- ***Hydrological infrastructure:*** Budgetary expenditure financing public investments into hydrological infrastructure (irrigation and drainage networks).
- ***Storage, marketing and other physical infrastructure***: Budgetary expenditure financing investments to off-farm storage and other market infrastructure facilities related to handling and marketing primary agricultural products (silos, harbour facilities – docks, elevators; wholesale markets, futures markets), as well as other physical infrastructure related to agriculture, when agriculture is the main beneficiary.
- ***Institutional infrastructure***: Budgetary expenditure financing investments to build and maintain institutional infrastructure related to the farming sector (e.g. land cadastres; machinery user groups, seed and species registries; development of rural finance networks; support to farm organisations, etc.).
- ***Farm restructuring***: Budgetary payments related to reform of farm structures financing entry, exit or diversification (outside agriculture) strategies.

Marketing and promotion

- ***Collective schemes for processing and marketing***: Budgetary expenditure financing investment in collective, mainly primary, processing, marketing schemes and marketing facilities, designed to improve marketing environment for agriculture.
- ***Promotion of agricultural products***: Budgetary expenditure financing assistance to collective promotion of agro-food products (e.g. promotion campaigns, participation on international fairs).
- ***Cost of public stockholding***: Budgetary expenditure covering the costs of storage, depreciation and disposal of public storage of agricultural products.
- ***Miscellaneous***: Budgetary expenditure financing other general services that cannot be disaggregated and allocated to the above categories, often due to a lack of information.

More detailed information on the indicators, their use and limitations is available in *OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculation, Interpretation and Use* (the PSE Manual) available on the OECD public website (http://www.oecd.org/agriculture/topics/agricultural-policy-monitoring-and-evaluation/documents/producer-support-estimates-manual.pdf).

Developments in Agricultural Policy and Support by Country

This part contains an overview of the developments of support in the OECD area and selected Emerging Economies overall, followed by chapters on agricultural policy developments and support to agriculture in each of the countries covered in this report. Each country chapter includes a brief summary of policy developments and support to agriculture, with a special focus on climate mitigation stated objectives and actions for agriculture, and related assessments and recommendations; a brief outline of historical policy trends; a more detailed description of the main policy developments in 2021-22; and information on the context in which agricultural policies are implemented.

3 Overall trends in agricultural support

OECD countries

Total support to agriculture (TSE) in OECD countries[1] represented USD 345 billion (EUR 301 billion) per year on average in 2019-21 of which 73%, or USD 247 billion (EUR 216 billion), was provided as support to producers individually (PSE). Producer support represented 17.3% of gross farm receipts (%PSE) in 2019-21 across the OECD area, a decline from around 28% in 2000-02 and more than 35% in 1986-88 (Table 3.1).

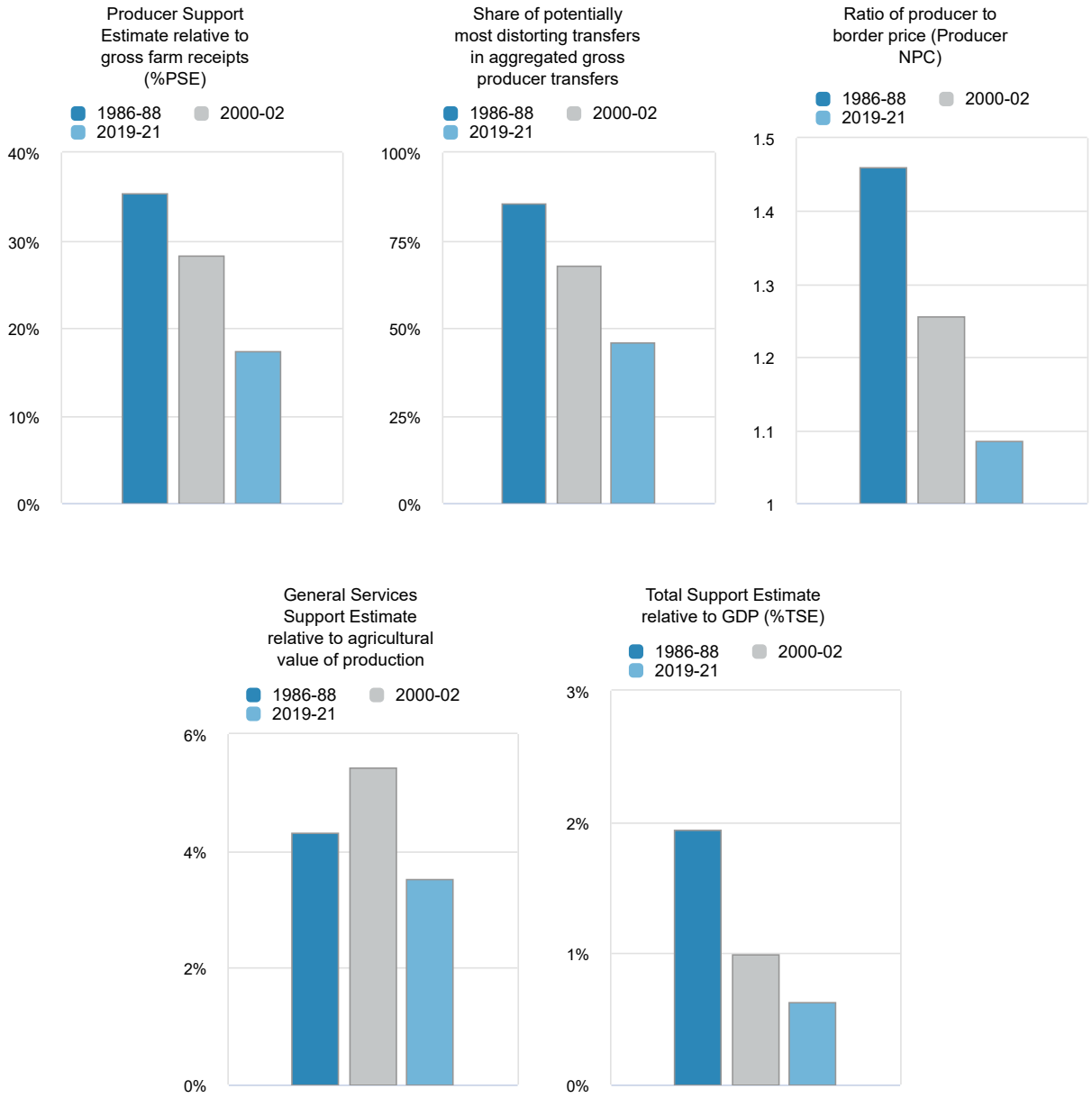
The way support is delivered to producers also evolved. In particular, the long-term decline of support based on commodity output (including market price support and output payments) characterises the evolution of support to agriculture in the OECD area. OECD work identifies this as having the strongest potential to distort agricultural production and trade together with payments based on the unconstrained use of variable inputs, which slightly increased across OECD countries compared to the beginning of the millennium. For these support measures, a particularly high risk of negative impacts on the environment has also been found. Rice is by far the commodity that receives the highest level of support in the OECD area, followed by sugar, sunflower seed and beef (Figure 3.2). Market price support represents the largest share of this support, and is driven by a range of domestic and trade policies. For a number of commodities, in particular maize, sorghum, soybeans and sheep meat, support is also provided through other types of transfers, including payments less directly coupled to production.

At the other end of the spectrum in the PSE classification, a number of countries apply significantly less-distorting forms of support, such as payments based on parameters not linked to current production, or based on non-commodity criteria such as land set-aside, or payments for specific environmental or animal welfare outcomes (Chapter 2, Figure 2.14). Most notably, payments based on historical entitlements (generally crop area or livestock numbers of a given reference period in the past) increased in the last two decades, representing some 4% of gross farm receipts (GFR) and about 22% of the PSE during 2019-21. The share of payments based on current crop area, animal numbers, receipts or income has fallen compared to 2000-02; these payments now also represent around 22% of total producer support (Table 3.1).

Expenditures financing general services to the sector (GSSE) increased (in nominal terms) in the OECD area from USD 37 billion per year in 2000-02 to USD 45 billion in 2019-21 (expressed in Euros, they slightly declined from EUR 40 billion to EUR 39 billion). However, relative to the size of the sector, expenditures for general services declined from 5.4% of agricultural value of production to 3.5%, suggesting that these expenditures did not keep pace with sector growth. In 2019-21, most of this went to infrastructure (USD 17 billion), a slight increase compared to 2000-02, and agricultural knowledge and innovation (USD 14 billion), an increase of 79% in nominal terms and almost in line with the sector's growth. Expenditures for inspection and control services more than doubled, while spending for marketing and promotion remained around the same and public stockholding declined substantially over the same period.

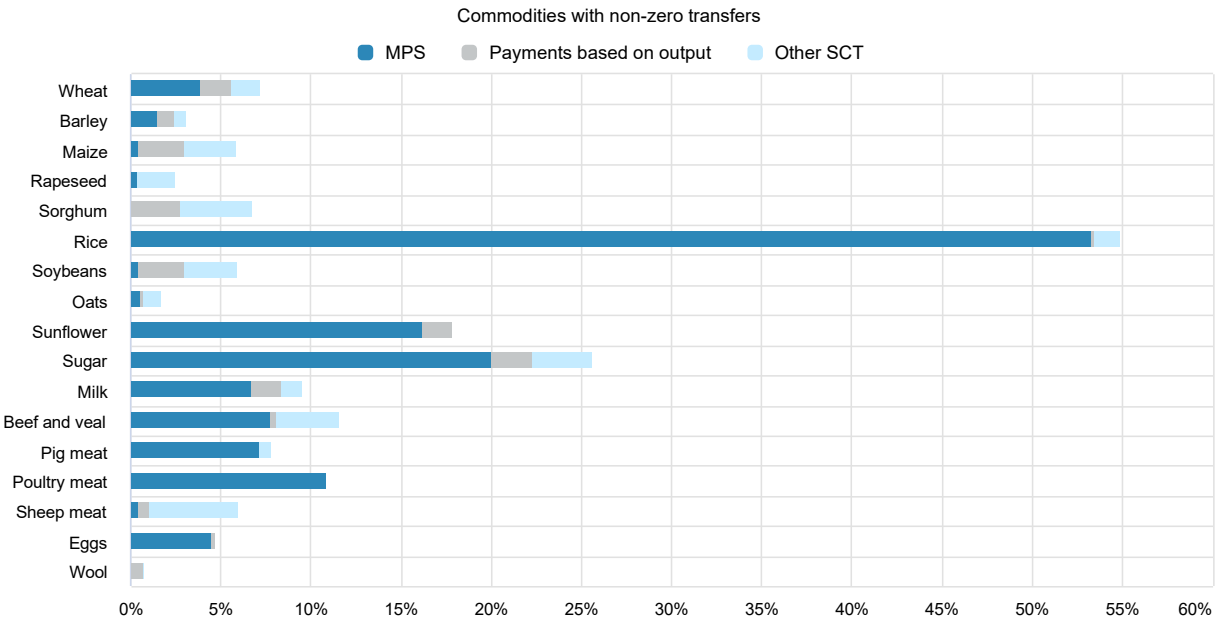
But all of these represented smaller shares of the GSSE expenditure (Table 3.1). Total support to agriculture as a share of GDP declined significantly over time.

Figure 3.1. OECD: Development of support to agriculture



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 3.2. OECD: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 3.1. OECD: Estimates of support to agriculture (USD)

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**594 108**	**673 335**	**1 268 316**	**1 199 097**	**1 222 456**	**1 383 396**
***of which:** share of MPS commodities (%)*	71.27	70.23	72.42	71.63	72.30	73.32
Total value of consumption (at farm gate)	**557 842**	**662 640**	**1 132 595**	**1 101 876**	**1 115 429**	**1 180 478**
Producer Support Estimate (PSE)	**230 224**	**216 984**	**247 240**	**243 906**	**252 441**	**245 375**
Support based on commodity output	187 284	139 248	101 838	101 935	100 711	102 867
Market Price Support[1]	174 689	124 295	90 416	97 749	89 890	83 608
Positive Market Price Support	178 990	124 886	90 892	98 188	90 123	84 365
Negative Market Price Support	-4 302	-592	-476	-439	-233	-757
Payments based on output	12 596	14 953	11 422	4 186	10 821	19 259
Payments based on input use	19 571	19 523	30 901	28 958	35 615	28 129
Based on variable input use	9 146	8 012	11 627	9 987	15 501	9 393
with input constraints	1 146	342	826	882	880	716
Based on fixed capital formation	6 882	5 079	10 042	10 687	11 210	8 228
with input constraints	1 638	629	2 250	2 324	2 346	2 082
Based on on-farm services	3 543	6 431	9 233	8 284	8 904	10 509
with input constraints	439	967	1 707	1 533	1 721	1 866
Payments based on current A/An/R/I, production required	19 377	41 382	53 834	56 565	51 182	53 755
Based on Receipts / Income	2 052	3 173	4 778	4 345	4 773	5 215
Based on Area planted / Animal numbers	17 325	38 209	49 056	52 220	46 408	48 541
with input constraints	4 093	16 898	41 230	44 757	39 206	39 726
Payments based on non-current A/An/R/I, production required	533	71	2 159	2 373	1 982	2 123
Payments based on non-current A/An/R/I, production not required	2 080	13 721	52 687	48 957	57 053	52 051
With variable payment rates	181	4 318	8 754	6 366	13 334	6 563
with commodity exceptions	0	4 079	8 582	6 229	13 152	6 364
With fixed payment rates	1 899	9 403	43 932	42 591	43 719	45 488
with commodity exceptions	1 561	6 081	2 729	2 515	2 588	3 084
Payments based on non-commodity criteria	1 078	3 206	5 058	4 387	5 031	5 756
Based on long-term resource retirement	1 076	2 900	3 378	2 873	3 375	3 886
Based on a specific non-commodity output	2	237	1 570	1 450	1 522	1 738
Based on other non-commodity criteria	0	69	111	65	135	132
Miscellaneous payments	300	-166	763	731	867	693
Percentage PSE (%)	**35.44**	**28.33**	**17.35**	**18.13**	**18.23**	**15.88**
Producer NPC (coeff.)	**1.46**	**1.26**	**1.09**	**1.09**	**1.09**	**1.08**
Producer NAC (coeff.)	**1.55**	**1.40**	**1.21**	**1.22**	**1.22**	**1.19**
General Services Support Estimate (GSSE)	**25 568**	**36 575**	**44 756**	**44 425**	**46 066**	**43 776**
Agricultural knowledge and innovation system	4 846	8 019	14 326	14 099	13 904	14 975
Inspection and control	1 076	1 931	4 115	4 195	4 272	3 878
Development and maintenance of infrastructure	10 223	16 399	17 076	18 350	17 899	14 981
Marketing and promotion	2 156	5 572	6 689	5 179	7 506	7 381
Cost of public stockholding	5 872	2 282	628	702	565	616
Miscellaneous	1 395	2 371	1 922	1 900	1 920	1 945
Percentage GSSE (% of TSE)	**9.27**	**13.20**	**12.96**	**13.29**	**13.21**	**12.38**
Consumer Support Estimate (CSE)	**-155 058**	**-117 160**	**-58 156**	**-74 274**	**-60 383**	**-39 810**
Transfers to producers from consumers	-163 991	-121 794	-86 720	-94 103	-85 352	-80 707
Other transfers from consumers	-22 443	-19 546	-26 194	-27 281	-26 024	-25 276
Transfers to consumers from taxpayers	19 956	23 580	53 438	45 825	50 121	64 367
Excess feed cost	11 420	599	1 321	1 284	871	1 807
Percentage CSE (%)	**-28.83**	**-18.33**	**-5.39**	**-7.03**	**-5.67**	**-3.57**
Consumer NPC (coeff.)	**1.50**	**1.27**	**1.11**	**1.12**	**1.11**	**1.10**
Consumer NAC (coeff.)	**1.41**	**1.22**	**1.06**	**1.08**	**1.06**	**1.04**
Total Support Estimate (TSE)	**275 748**	**277 139**	**345 434**	**334 155**	**348 628**	**353 518**
Transfers from consumers	186 434	141 339	112 914	121 384	111 376	105 983
Transfers from taxpayers	111 757	155 345	258 713	240 053	263 277	272 810
Budget revenues	-22 443	-19 546	-26 194	-27 281	-26 024	-25 276
Percentage TSE (% of GDP)	**1.94**	**1.00**	**0.63**	**0.62**	**0.67**	**0.61**
Total Budgetary Support Estimate (TBSE)	**101 060**	**152 844**	**255 018**	**236 406**	**258 738**	**269 909**
Percentage TBSE (% of GDP)	**0.71**	**0.55**	**0.47**	**0.44**	**0.49**	**0.47**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
The OECD total for 1986-88 includes all 38 OECD member countries except Chile, Colombia, Costa Rica, Israel, Latvia, Lithuania and Slovenia, for which data are not available. The OECD total for 2000-02 includes all 38 OECD member countries except Latvia and Lithuania. TSE as a share of GDP for 1986-88 for the OECD is an estimate based on available data.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities: see notes to individual country tables.
Source: OECD (2021), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Emerging economies

Agricultural policies in the 11 emerging economies[2] covered by this report generated positive transfers to the sector averaging USD 464 billion (EUR 403 billion) per year in 2019-21 of which USD 357 billion (EUR 310 billion) went to individual producers. At the same time, however, policies in a few countries, such as Argentina, India and Viet Nam, suppressed domestic prices for certain products, generating an implicit tax in the form of negative market price support (MPS) averaging USD 117 billion (EUR 101 billion) per year in the same period.

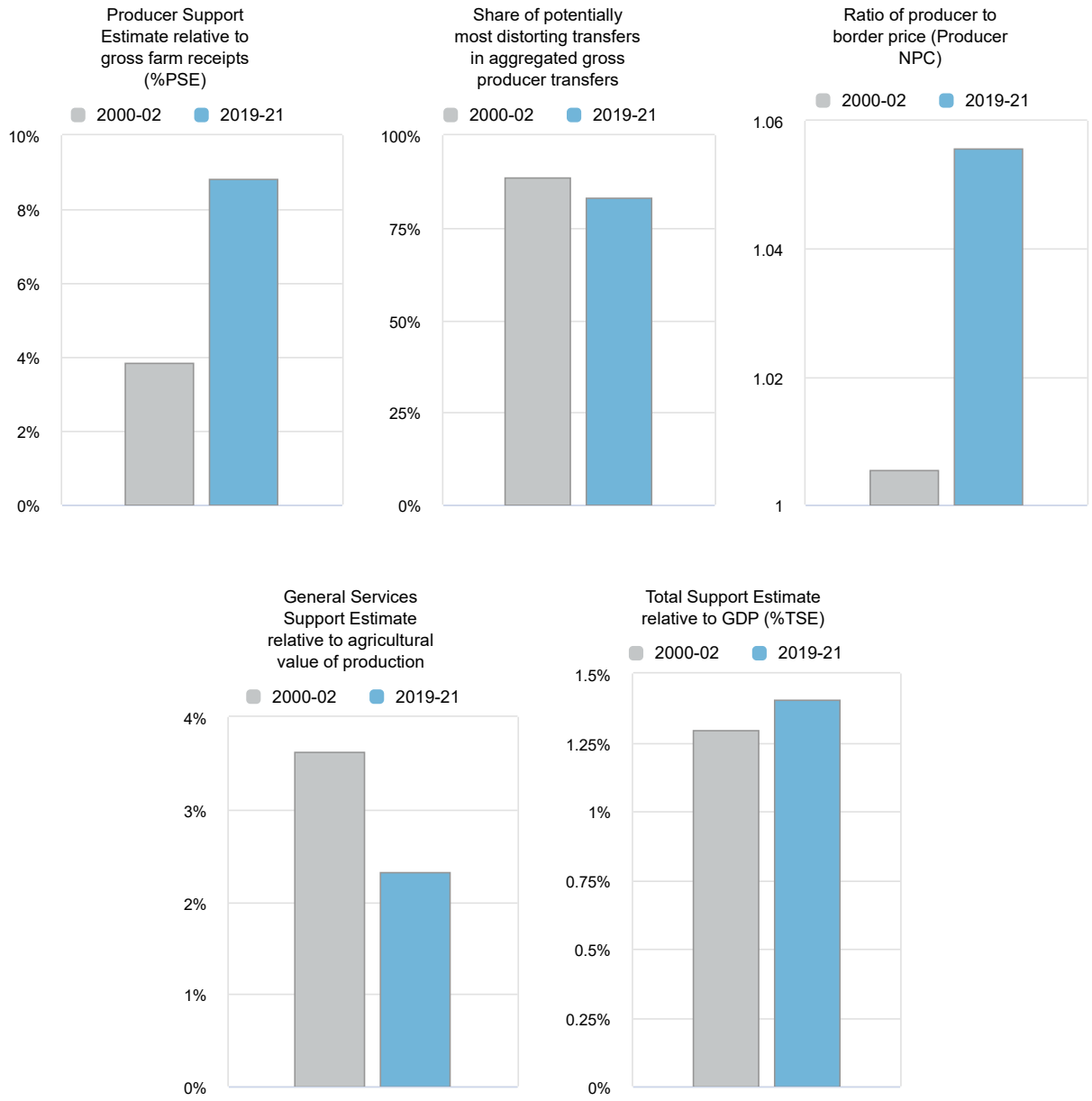
As a consequence, net TSE represented USD 347 billion (EUR 302 billion) per year, while net PSE averaged USD 240 billion (EUR 209 billion) per year during 2019-21. Aggregate support to producers across emerging economies represented on average 8.8% of gross farm receipts in 2019-21: positive transfers to producers worth 13.1% of GFR, and an implicit tax worth -4.3% of GFR. This %PSE represents a substantial increase from 3.8% in 2000-02 (Table 3.2).

The share of transfers based on output (accounting for both positive and negative MPS and output-based payments) and unconstrained variable input use in gross producer support still averaged 83% in 2019-21 – a modest decline from the 89% observed at the beginning of the century. In emerging economies, maize, sugar and rapeseed were the most supported commodities (with transfers amounting to between 23% and 30% of commodity gross farm receipts) while oats and milk were the most taxed in 2019-21. Almost all of these transfers to specific commodities operate through market price support, and are a result of domestic or trade policies such as minimum support prices or import tariffs (in the case of positive transfers) or export taxation and other restrictions (in the case of negative transfers).

Among remaining forms of producer support, the most important are payments based on other input use (mainly fixed capital formation) and payments to areas planted and animal numbers. Payments based on areas and animal numbers were almost non-existent across emerging economies in 2000-02 but reached more than 13% of aggregate net support to producers in 2019-21. In turn, the relative importance of support for investments, (often related to irrigation) declined over time, now representing less than 8% of the PSE. All other forms of support to producers remain marginal (Table 3.2).

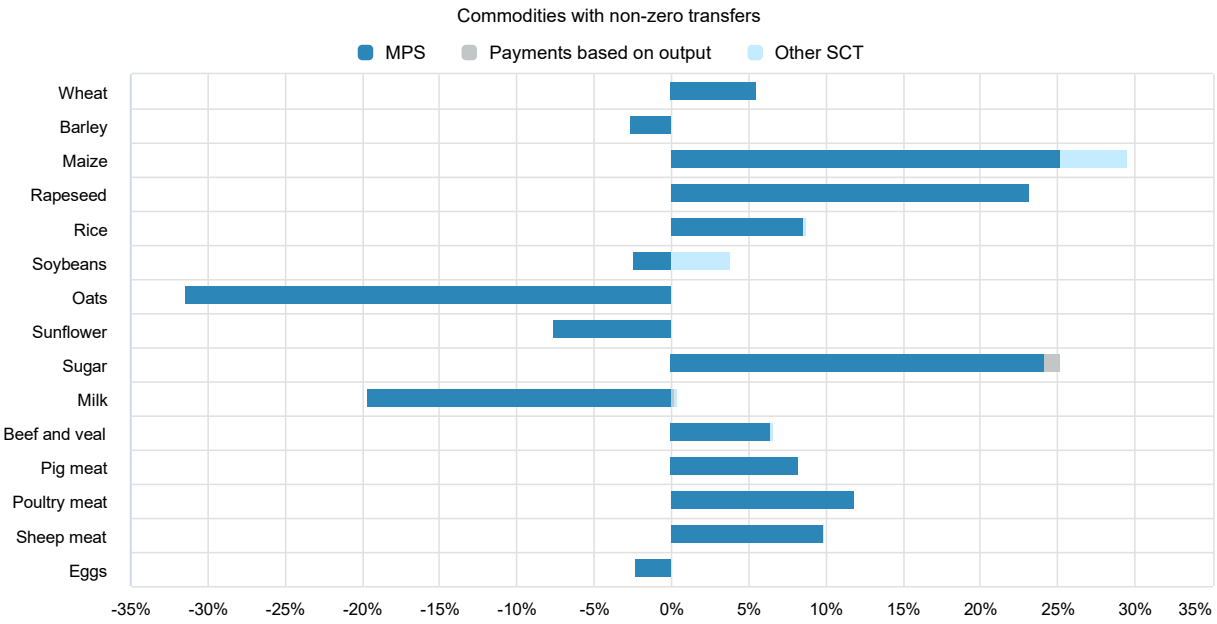
Expenditure on GSSE in emerging economies reached an annual average of USD 60 billion (EUR 52 billion) in 2019-21. Most of this went to infrastructure projects (USD 28 billion), often related to irrigation, and public stockholding (USD 16 billion). The remaining expenditure mainly went to finance agricultural knowledge and innovation (USD 11 billion) (Table 3.2). Relative to agricultural value of production, average expenditures for general services declined somewhat and remain lower than the OECD average. Aggregate total support to agriculture as a share of GDP slightly increased to 1.4% in 2019-21, and is mainly driven by producer support, at close to 70% of the total support.

Figure 3.3. Emerging Economies: Development of support to agriculture



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 3.4. Emerging Economies: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 3.2. Emerging Economies: Estimates of support to agriculture (USD)

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**522 758**	**2 597 222**	**2 407 902**	**2 585 029**	**2 798 733**
***of which:** share of MPS commodities (%)*	75.13	78.39	77.40	76.87	80.91
Total value of consumption (at farm gate)	**521 308**	**2 526 229**	**2 289 535**	**2 539 867**	**2 749 285**
Producer Support Estimate (PSE)	**20 809**	**240 265**	**204 817**	**238 650**	**277 328**
Support based on commodity output	1 545	113 634	91 466	113 343	136 094
Market Price Support[1]	1 130	109 630	88 405	108 712	131 772
Positive Market Price Support	24 714	226 131	189 074	226 115	263 205
Negative Market Price Support	-23 584	-116 502	-100 669	-117 402	-131 434
Payments based on output	416	4 005	3 061	4 631	4 322
Payments based on input use	17 321	68 415	62 620	65 565	77 060
Based on variable input use	11 479	47 706	42 326	46 463	54 329
with input constraints	0	805	995	730	689
Based on fixed capital formation	4 466	17 901	17 455	16 866	19 382
with input constraints	1	944	1 084	661	1 087
Based on on-farm services	1 377	2 809	2 839	2 236	3 350
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	813	31 872	28 117	32 614	34 885
Based on Receipts / Income	813	2 166	2 455	1 960	2 083
Based on Area planted / Animal numbers	0	29 706	25 662	30 654	32 802
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	370	23 392	19 981	24 078	26 116
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	370	23 392	19 981	24 078	26 116
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	458	1 629	1 681	1 550	1 658
Based on long-term resource retirement	458	1 629	1 681	1 550	1 658
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	302	1 322	951	1 500	1 515
Percentage PSE (%)	**3.84**	**8.81**	**8.11**	**8.79**	**9.42**
Producer NPC (coeff.)	**1.01**	**1.06**	**1.04**	**1.06**	**1.07**
Producer NAC (coeff.)	**1.04**	**1.10**	**1.09**	**1.10**	**1.10**
General Services Support Estimate (GSSE)	**18 949**	**60 211**	**54 990**	**60 734**	**64 909**
Agricultural knowledge and innovation system	2 978	10 906	11 745	10 273	10 701
Inspection and control	784	4 404	4 291	4 392	4 528
Development and maintenance of infrastructure	6 955	27 884	21 710	29 665	32 276
Marketing and promotion	28	716	649	700	798
Cost of public stockholding	8 102	16 153	16 436	15 594	16 430
Miscellaneous	103	148	158	109	176
Percentage GSSE (% of TSE)	**42.59**	**17.34**	**19.65**	**16.14**	**16.84**
Consumer Support Estimate (CSE)	**-1 171**	**-124 589**	**-104 995**	**-110 368**	**-158 403**
Transfers to producers from consumers	-4 122	-143 619	-105 908	-144 244	-180 705
Other transfers from consumers	-2 853	-47 748	-28 065	-62 306	-52 873
Transfers to consumers from taxpayers	4 735	46 783	20 033	77 019	43 297
Excess feed cost	1 069	19 996	8 944	19 164	31 878
Percentage CSE (%)	**-0.23**	**-5.02**	**-4.63**	**-4.48**	**-5.85**
Consumer NPC (coeff.)	**1.01**	**1.08**	**1.06**	**1.09**	**1.09**
Consumer NAC (coeff.)	**1.00**	**1.05**	**1.05**	**1.05**	**1.06**
Total Support Estimate (TSE)	**44 494**	**347 259**	**279 840**	**376 402**	**385 534**
Transfers from consumers	6 975	191 367	133 972	206 551	233 578
Transfers from taxpayers	40 372	203 640	173 932	232 157	204 829
Budget revenues	-2 853	-47 748	-28 065	-62 306	-52 873
Percentage TSE (% of GDP)	**1.29**	**1.41**	**1.18**	**1.64**	**1.41**
Total Budgetary Support Estimate (TBSE)	**43 364**	**237 629**	**191 435**	**267 690**	**253 762**
Percentage TBSE (% of GDP)	**1.26**	**0.96**	**0.81**	**1.16**	**0.93**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
The Emerging Economies include Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities: see notes to individual country tables.
Source: OECD (2021), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

All countries

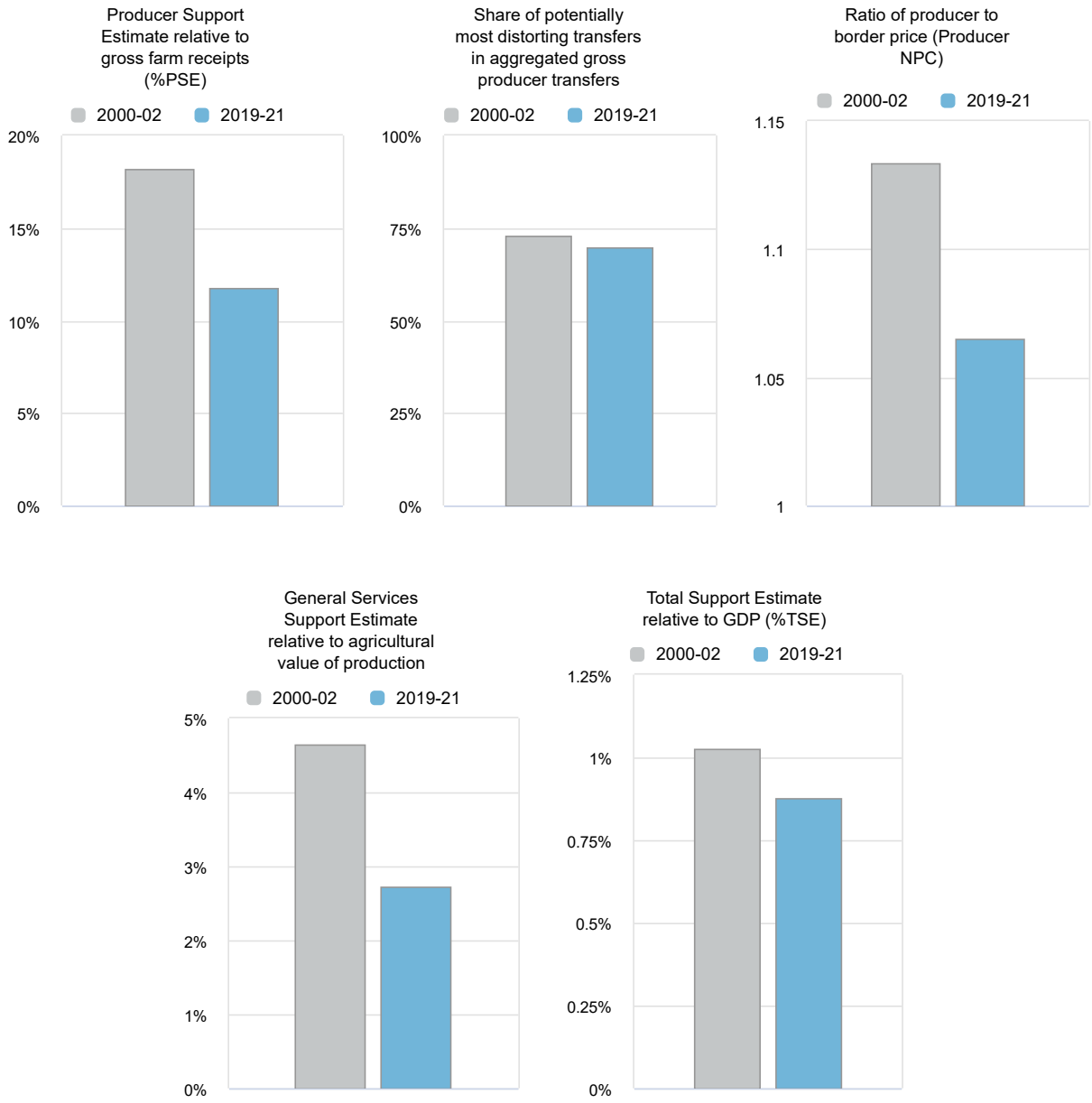
The total support to agriculture provided in all countries covered in this report represented USD 700 billion (EUR 540 billion) per year on average in 2019-21, of which around 71% or USD 494 billion (EUR 383 billion) were provided as support to producers. Gross transfers to the sector are significantly larger than that, given the negative market price support estimated for some emerging economies: in total, USD 817 billion (EUR 631 billion) were transferred to the sector across the 54 countries covered, while at the same time negative MPS in some countries amounted to USD 117 billion (EUR 91 billion). Expressed as a share of gross farm receipts, aggregate support to producers represented 11.8% in 2019-21 on average for all countries covered, a reduction from 18.2% in 2000-02 (Table 3.3).

Changes between 2000-02 and 2019-21 to the structure of support in all countries in the report were relatively moderate. The share of potentially most-distorting transfers (based on output or based on unconstrained use of variable inputs) declined slightly, but these policies continue to represent around 70% of gross producer transfers across all countries (whether positive or negative, in absolute terms). Transfers based on output became less prominent while those based on unconstrained input use increased. Overall, across all countries covered, sugar is most strongly supported commodity, followed by maize and rice. Several livestock products, particularly beef, pig meat, poultry meat and sheep meat, also receive substantial transfers.

Among the remaining forms of support to producers, the most important are payments based on area planted and animal numbers (18% of all producer support), and those based on historical parameters not requiring production. The importance of these latter payments (which are decoupled from current production and hence much less production- and trade-distorting and with less impact on the environment) increased significantly and now represents 16% of all producer support (Table 3.3).

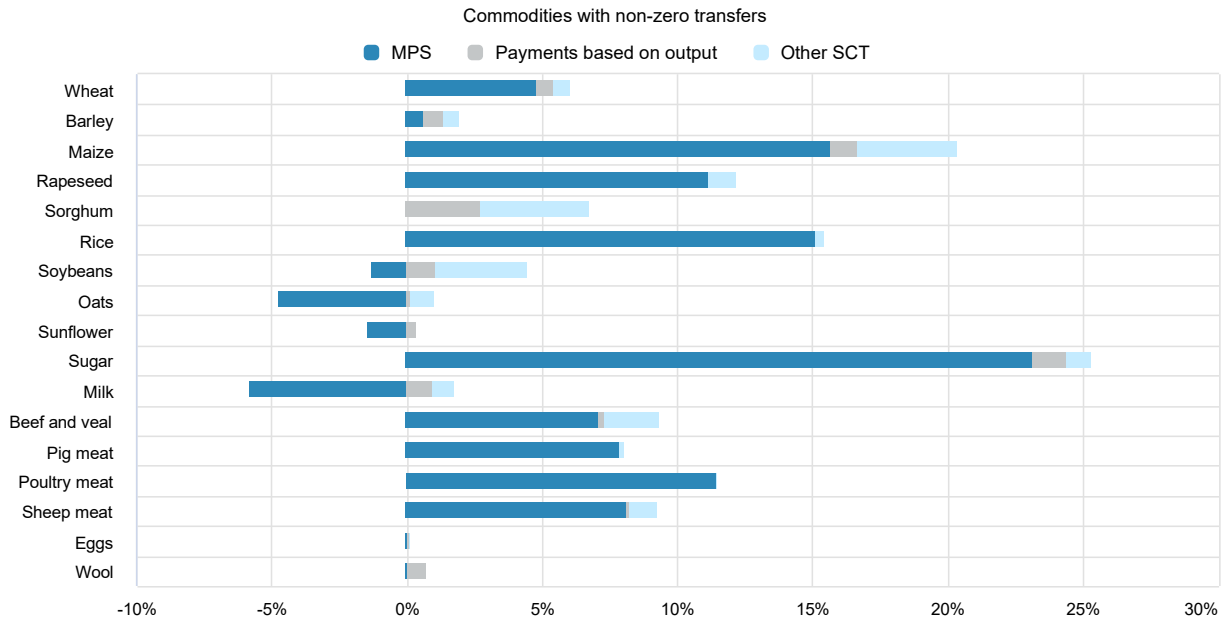
Across all countries in this report, the expenditures financing **general services** to the sector (GSSE) reached an annual average of USD 106 billion (EUR 90 billion) in 2019-21, almost twice the amount in nominal terms spent at the beginning of the century. Most of this went to infrastructure projects (USD 45 billion), agricultural knowledge and innovation (USD 26 billion), and public stockholding (USD 17 billion) (Table 3.3). In spite of the growth, expenditures for general services declined in relative terms as the value of agricultural production more than tripled in nominal terms since 2000-02. **Total support to agriculture** as a share of GDP declined slightly over time, mainly driven by the smaller relative size of the sector within economies.

Figure 3.5. All countries: Development of support to agriculture



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 3.6. All countries: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 3.3. All countries: Estimates of support to agriculture (USD)

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**1 196 093**	**3 893 048**	**3 633 791**	**3 831 389**	**4 213 965**
***of which:** share of MPS commodities (%)*	72.37	76.37	75.45	75.35	78.31
Total value of consumption (at farm gate)	**1 183 948**	**3 714 773**	**3 445 221**	**3 704 956**	**3 994 142**
Producer Support Estimate (PSE)	**237 793**	**493 717**	**454 046**	**495 938**	**531 167**
Support based on commodity output	140 793	215 879	194 046	214 661	238 930
Market Price Support[1]	125 424	200 393	186 745	199 154	215 281
Positive Market Price Support	149 600	317 476	287 941	316 789	347 697
Negative Market Price Support	-24 176	-117 083	-101 197	-117 636	-132 416
Payments based on output	15 369	15 486	7 301	15 507	23 649
Payments based on input use	36 843	100 236	91 947	101 124	107 638
Based on variable input use	19 491	59 858	52 492	62 159	64 922
with input constraints	342	1 653	1 878	1 608	1 472
Based on fixed capital formation	9 545	28 230	28 399	27 885	28 405
with input constraints	630	3 195	3 365	2 960	3 259
Based on on-farm services	7 808	12 149	11 056	11 079	14 312
with input constraints	967	1 711	1 533	1 721	1 880
Payments based on current A/An/R/I, production required	42 194	88 121	86 482	85 988	91 892
Based on Receipts / Income	3 986	7 160	6 918	6 973	7 590
Based on Area planted / Animal numbers	38 209	80 960	79 564	79 015	84 302
with input constraints	16 898	42 708	45 844	40 487	41 794
Payments based on non-current A/An/R/I, production required	71	2 159	2 373	1 982	2 123
Payments based on non-current A/An/R/I, production not required	14 091	78 544	71 438	83 338	80 856
With variable payment rates	4 318	8 754	6 366	13 334	6 563
with commodity exceptions	4 079	8 582	6 229	13 152	6 364
With fixed payment rates	9 773	69 789	65 071	70 004	74 293
with commodity exceptions	6 081	2 729	2 515	2 588	3 084
Payments based on non-commodity criteria	3 664	6 850	6 297	6 759	7 495
Based on long-term resource retirement	3 358	5 025	4 567	4 935	5 573
Based on a specific non-commodity output	237	1 713	1 665	1 686	1 787
Based on other non-commodity criteria	69	113	65	137	136
Miscellaneous payments	136	1 927	1 463	2 086	2 232
Percentage PSE (%)	**18.17**	**11.79**	**11.64**	**12.01**	**11.73**
Producer NPC (coeff.)	**1.13**	**1.07**	**1.06**	**1.07**	**1.07**
Producer NAC (coeff.)	**1.22**	**1.13**	**1.13**	**1.14**	**1.13**
General Services Support Estimate (GSSE)	**55 525**	**106 337**	**100 245**	**107 840**	**110 925**
Agricultural knowledge and innovation system	10 996	25 767	26 204	24 475	26 622
Inspection and control	2 715	8 815	8 565	8 818	9 063
Development and maintenance of infrastructure	23 354	45 429	40 405	48 036	47 846
Marketing and promotion	5 600	7 466	5 875	8 317	8 207
Cost of public stockholding	10 384	16 789	17 138	16 165	17 065
Miscellaneous	2 475	2 069	2 058	2 029	2 121
Percentage GSSE (% of TSE)	**17.26**	**15.18**	**16.17**	**14.75**	**14.79**
Consumer Support Estimate (CSE)	**-118 330**	**-183 172**	**-180 066**	**-171 253**	**-198 197**
Transfers to producers from consumers	-125 915	-230 875	-200 757	-230 103	-261 764
Other transfers from consumers	-22 399	-73 975	-55 356	-88 335	-78 235
Transfers to consumers from taxpayers	28 315	100 243	65 756	127 150	107 825
Excess feed cost	1 669	21 434	10 292	20 035	33 977
Percentage CSE (%)	**-10.24**	**-5.07**	**-5.33**	**-4.79**	**-5.10**
Consumer NPC (coeff.)	**1.14**	**1.09**	**1.08**	**1.09**	**1.09**
Consumer NAC (coeff.)	**1.11**	**1.05**	**1.06**	**1.05**	**1.05**
Total Support Estimate (TSE)	**321 633**	**700 297**	**620 047**	**730 928**	**749 916**
Transfers from consumers	148 314	304 850	256 113	318 437	339 999
Transfers from taxpayers	195 717	469 423	419 289	500 825	488 153
Budget revenues	-22 399	-73 975	-55 356	-88 335	-78 235
Percentage TSE (% of GDP)	**1.02**	**0.88**	**0.79**	**0.96**	**0.88**
Total Budgetary Support Estimate (TBSE)	**196 209**	**499 904**	**433 302**	**531 774**	**534 635**
Percentage TBSE (% of GDP)	**0.63**	**0.63**	**0.56**	**0.70**	**0.62**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
The All countries total includes all OECD countries, non-OECD EU Member States, and the Emerging Economies: Argentina, Brazil, China, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam. The All countries total for 2000-02 includes data for all countries except Latvia and Lithuania, for which data are not available.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities: see notes to individual country tables.
Source: OECD (2021), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Notes

[1] The OECD total does not include the non-OECD EU Member States.

[2] The emerging economies in this report include Argentina, Brazil, the People's Republic of China (hereafter "China"), India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine, and Viet Nam.

4 Argentina

Support to agriculture

Support to producers in Argentina has been negative since the beginning of the 2000s, reflecting export taxes that depress domestic prices received by producers. The limited payments producers receive focus on input support, provided mainly in the form of credit at preferential rates.

Fluctuations in support are driven by changes in export tax rates and by unstable macroeconomic conditions such as the steep depreciation of the Argentine peso since 2018. The most extreme negative value in the level of support was -51.1% of gross farm receipts in 2008, falling to -10.3% in 2017 and to -18.3% in 2019-21. Negative market price support has been the main component of the Producer Support Estimate (PSE). As a result, 99% of policy transfers were most-distorting in 2019-21. The ratio of producer to border price (NPC) reached 0.84 in 2019-21, making producers' prices on average 16% below world market prices.

Soybeans are the main export, with the highest export tax rate and the most negative Single Commodity Transfers (SCT), representing 45% of commodity gross farm receipts. Several grains and livestock products also have negative SCTs, while price support and SCTs are positive for pig meat and eggs.

First buyers of agricultural commodities benefit from lower farm-gate prices. Mirroring the negative PSE, consumers enjoy a positive Consumer Support Estimate of 20.5% of expenditure at farm-gate prices.

Support to general services (GSSE) relative to the value of agricultural production slightly decreased from 0.6% in 2000-02 to 0.5% in 2019-21 – lower than the OECD average. Expenditure on agricultural innovation systems represents the biggest component. Agricultural production and exports grew dynamically in the last two decades due to an innovative private sector and support by public services, particularly for knowledge, research and extension, and sanitary inspection.

Most of Argentina's budgetary support to agriculture targets GSSE rather than individual producers. Total budgetary support to farmers and the sector overall (TBSE) was 0.1% of GDP, well below the absolute value of negative market price support, making the total support estimate to agriculture (TSE) also negative throughout the period covered: -1.1% of GDP in 2000-02 and -1.9% in 2019-21.

Recent policy changes

Export taxes were eliminated in December 2021 for several products, including peanuts, popcorn maize, seeds, prepared fruits and vegetables, oatmeal, rye, chickpeas, lentils, beans, pearled or crushed oatmeal, potato flakes, potato and cassava starch, and organic products. However, they remain for key products such as soybeans and beef. Until 2022, the government adjusted export tax rates by discretionary decree using a special authorisation from Congress based on "economic emergency" considerations. These special executive powers expired on 1 January 2022 because the 2022 Budget Law was not approved in Congress.

In August 2021, Congress passed a new Biofuels Law that reduces the mandated biodiesel blend rate from 10% to 5% and authorises the Energy Secretariat to reduce the rate to a minimum of 3% and to reduce the blending rate of maize in bio-ethanol. These reductions might affect investment in biofuels up to the expiration date of the new law in December 2030.

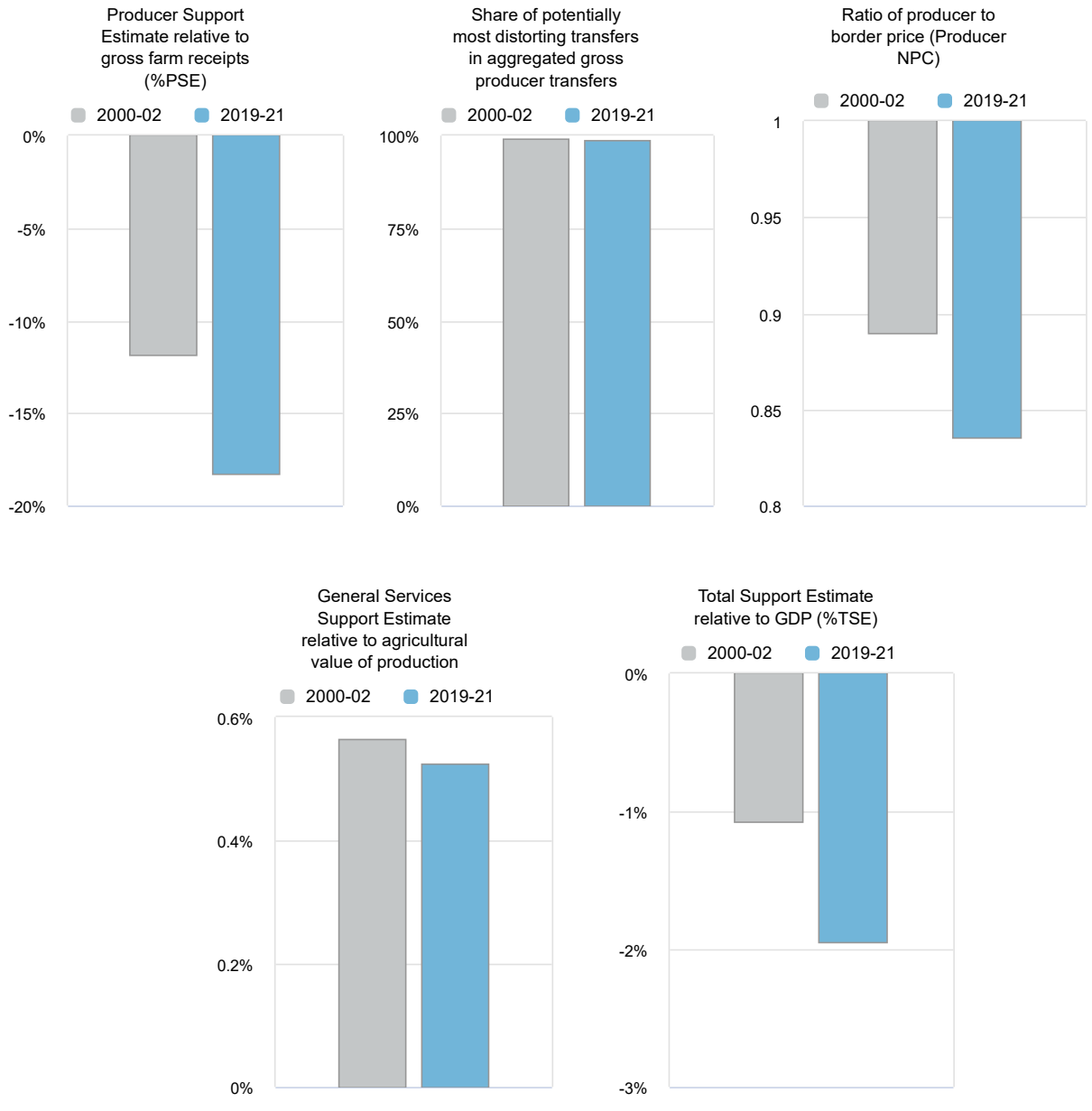
SENASA, the agency leading plant and animal health and food safety, took several decisions related to the pig meat sector. It created the National Animal Health and Welfare Commissions for Swine and other animal species as bodies for sharing and exchanging information and collecting the demands, opinions and proposals of stakeholders and other public agencies in the animal health decision-making process. A new regulation for swine production plants to be officially recognised as "free of disease" defines procedures that follow the World Organization for Animal Health (OIE) standards on compartmentalisation. Following African Swine Fever (ASF) outbreaks in the Dominican Republic and Haiti, SENASA declared a sanitary alert in November 2021 covering the entire Argentine territory and adopting and strengthening prevention measures to reduce the risk of entry.

Assessment and recommendations

- Given agriculture's high share of greenhouse gas (GHG) emissions (30%), Argentina's commitment to reduce national emissions by 19% in 2030 relative to 2007 may require specific mitigation targets for the agricultural sector and measures to achieve those targets.
- Actions proposed in the Nationally Determined Contributions (NDCs) for the agriculture and livestock sector are welcome, such as the promotion of sustainable and resilient practices, prevention and climatic risk transfer, and research and capacity building. The NDC implementation plans under development, including for deforestation, should be concrete and monitored.
- The recent inventory of GHG emissions from agriculture is valuable to support the design, implementation and monitoring of mitigation policies. Initiatives to better estimate the carbon footprint, such as recently for wine, can create awareness and capacity to implement and monitor mitigation practices from farm level all along the value chain. Research projects such as those implemented by the National Institute for Agricultural Technology (INTA) can contribute to the adoption of mitigation practices.
- Taxes and other restrictions on agriculture exports should be phased out in line with an economy-wide tax system and would enhance policy certainty with alternative sources of fiscal revenue. Unpredictable export restrictions create negative incentives for long-term investments and reduce global food security. Agricultural policy could be better anchored in a broad long-term policy framework, moving towards more neutral, stable, predictable and targeted policies.
- The Argentina Against Hunger plan provides monthly financial support to consumers through an electronic card. Such consumer support through social policies is more effective than trade measures that depress domestic prices of primary commodities that represent only a small share of food expenditures. The programme proved to be useful in providing food assistance to vulnerable populations in the context of the COVID-19 pandemic. However, these programmes should target the population most in need and require monitoring of implementation.
- To deliver research, extension and other public goods for agricultural innovation, and thereby increase productivity growth (which averaged only 0.3% in the last decade), Argentina needs to develop systematic monitoring of efforts and results in R&D and innovation, and define and implement strategic priorities. Innovation policy should focus on public goods in areas where the private sector has difficulty to deliver, such as those related to sustainability and less-developed value chains, or for regional economies outside the Pampas region. Improving the environmental performance of agriculture will also require enhanced monitoring and information systems for better policy design.

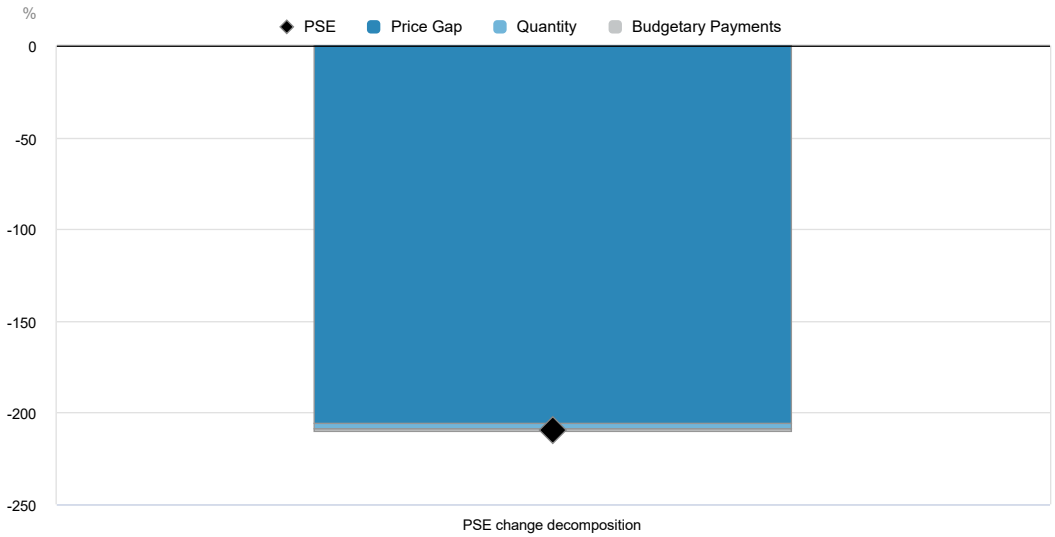
- The Special Tobacco Fund (FET), with a budget near that of the National Institute for Agricultural Technology (INTA), should be reformed. Output payments to tobacco producers are inefficient for social objectives and should be phased out. The resources could be used to diversify poor tobacco-producing areas through investment in human and physical capital or for targeted social policies. Such reform should include monitoring and evaluation of initiatives implemented by the provinces.

Figure 4.1. Argentina: Development of support to agriculture



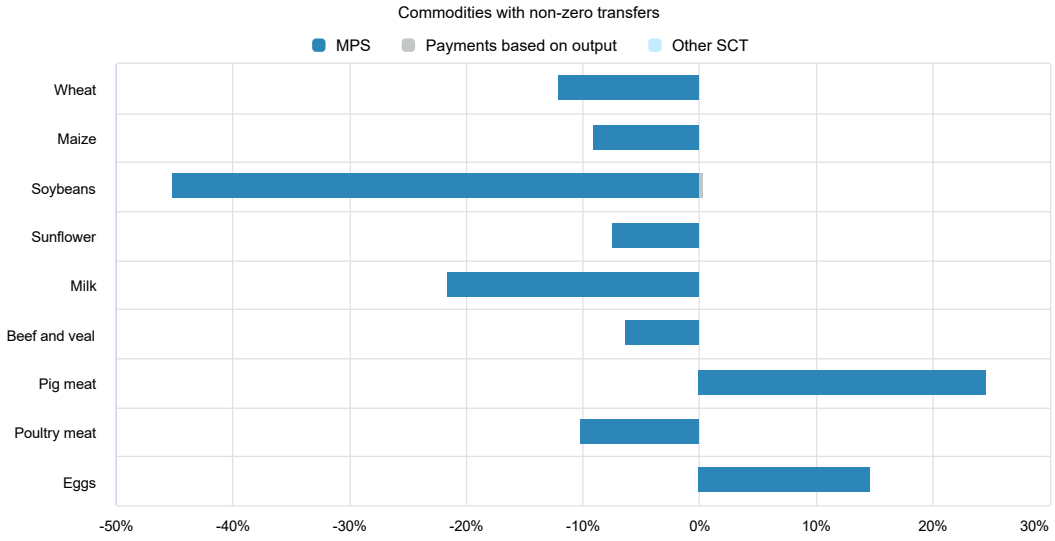
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 4.2. Argentina: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 4.3. Argentina: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 4.1. Argentina: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**17 022**	**46 894**	**41 266**	**43 830**	**55 587**
***of which:** share of MPS commodities (%)*	85.72	84.70	83.60	85.30	85.19
Total value of consumption (at farm gate)	**7 998**	**32 058**	**26 863**	**31 967**	**37 344**
Producer Support Estimate (PSE)	**-1 035**	**-8 996**	**-11 760**	**-4 614**	**-10 614**
Support based on commodity output	-1 069	-9 103	-11 873	-4 702	-10 736
Market Price Support[1]	-1 131	-9 192	-11 952	-4 864	-10 760
Positive Market Price Support	150	294	257	205	419
Negative Market Price Support	-1 280	-9 486	-12 209	-5 069	-11 179
Payments based on output	62	89	79	163	24
Payments based on input use	34	104	110	85	118
Based on variable input use	2	6	2	6	11
with input constraints	0	0	0	0	0
Based on fixed capital formation	23	76	84	59	85
with input constraints	0	0	0	0	0
Based on on-farm services	8	22	24	20	23
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	3	3	2	3
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	3	3	2	3
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**-11.86**	**-18.27**	**-28.37**	**-10.47**	**-19.05**
Producer NPC (coeff.)	**0.89**	**0.84**	**0.77**	**0.90**	**0.83**
Producer NAC (coeff.)	**0.89**	**0.85**	**0.78**	**0.91**	**0.84**
General Services Support Estimate (GSSE)	**116**	**262**	**292**	**264**	**230**
Agricultural knowledge and innovation system	66	146	168	150	120
Inspection and control	33	83	93	80	75
Development and maintenance of infrastructure	17	31	30	31	33
Marketing and promotion	0	2	1	3	1
Cost of public stockholding	0	0	0	0	0
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	..	..	..	..	..
Consumer Support Estimate (CSE)	**456**	**6 838**	**8 377**	**4 138**	**8 000**
Transfers to producers from consumers	483	7 218	8 935	4 025	8 694
Other transfers from consumers	-6	106	-2	313	7
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	-21	-486	-556	-201	-701
Percentage CSE (%)	**12.59**	**20.51**	**31.18**	**12.94**	**21.42**
Consumer NPC (coeff.)	**0.88**	**0.82**	**0.75**	**0.88**	**0.81**
Consumer NAC (coeff.)	**0.89**	**0.83**	**0.76**	**0.89**	**0.82**
Total Support Estimate (TSE)	**-919**	**-8 734**	**-11 468**	**-4 351**	**-10 385**
Transfers from consumers	-477	-7 324	-8 933	-4 339	-8 701
Transfers from taxpayers	-436	-1 516	-2 532	-325	-1 691
Budget revenues	-6	106	-2	313	7
Percentage TSE (% of GDP)	**-1.07**	**-1.95**	**-2.58**	**-1.14**	**-2.12**
Total Budgetary Support Estimate (TBSE)	**212**	**458**	**484**	**513**	**375**
Percentage TBSE (% of GDP)	**0.10**	**0.10**	**0.11**	**0.13**	**0.08**
GDP deflator (2000-02=100)	**100**	**6 863**	**4 483**	**6 272**	**9 833**
Exchange rate (national currency per USD)	**1.70**	**71.32**	**48.23**	**70.64**	**95.08**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Argentina are: wheat, maize, soybean, sunflower, fruit and vegetables, milk, beef and veal, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

For many decades, Argentina's agricultural policies alternated between free trade and import substitution under different economic policy frameworks (OECD, 2019[1]). Argentina liberalised trade in the late 1970s and explored ways to increase trade with its neighbours and other economies from the second half of the 1980s. The Argentine economy became more integrated in international trade, including the liberalisation of the agro-food sector, in the 1990s, in particular through the creation of MERCOSUR[1] in 1991 and the 1994 WTO Agreement.

After the financial crisis in 2001, Argentina increased tariffs, established price controls and re-introduced export taxes on agricultural products such as soybeans in order to raise revenue and reduce basic food prices. Further export restrictions in the form of quotas for wheat, maize, milk, and beef were imposed in 2008, introducing uncertainty in transactions. Between 2007 and 2011, a consumer price subsidy was implemented. The National Office of Agricultural Commercial Control (ONCCA) agency provided payments to processors purchasing wheat, maize, soybeans, and sunflower products from the local market.

In 2015, the government reduced export taxes on soybeans and soybean oil, and eliminated export taxes on all other agricultural products. The government also eliminated all export quotas and free-floated the exchange rate of the Argentine peso to other currencies.

However, with the 2018-19 peso depreciation and the subsequent economic recession, export taxes were re-established not only for agro-food products but for all goods. The change of government in December 2019 resulted in an agricultural policy shift. Agricultural specific export taxes that had been eliminated or reduced in December 2015 were re-instated for most products in early 2020, while exchange-rate controls introduced in the beginning of 2020 resulted in a widening gap between the legal (so-called official) exchange rate and the other market exchange rates.

While historically agricultural trade policies and their effect on farm prices have been alternating between trade liberalising and restrictive policies, long lasting agricultural institutions created since the 1950s remain relevant to the sector's development. For instance, the National Institute of Agricultural Technology (INTA), created in the mid-1950s, continues to provide general services to research and extension. The long-established animal and plant health institutes were merged into SENASA in 1996. In the private sector, innovative service providers to farmers were created, such as AACREA in 1960 and AAPRESID in 1989 (Table 4.2).

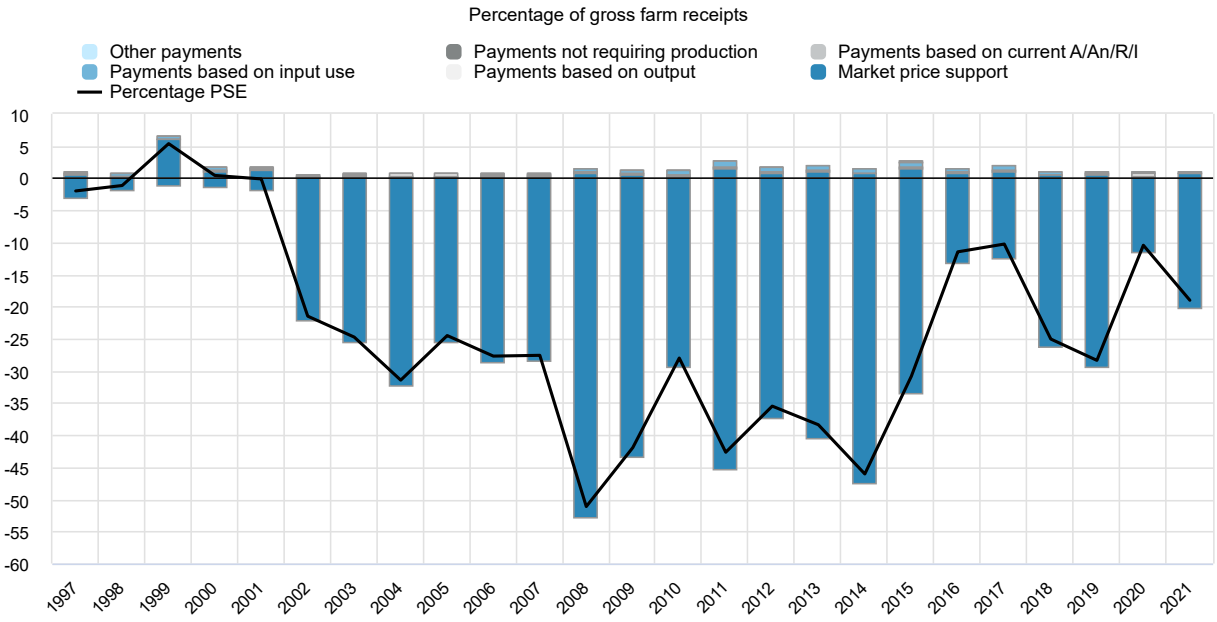
Table 4.2. Argentina: Agricultural policy trends

Period	Framework	Changes in agricultural policies
Prior to 1990	Alternate free trade and import substitution policies	Price interventions on main agricultural products, mandatory public stockholding, export taxes on agricultural trade, tariffs on imports of agricultural inputs such as fertiliser, low levels of investment in private agricultural R&D and infrastructure in general Several attempts to liberalise trade Creation of agricultural R&D and extension services institute INTA (1956); private institutions such as AACREA (1960) and AAPRESID (1989) created to provide services to farmers
1991-2001	Shifts to open the economy	Dismantling stockholding and price-setting public institutions, reduction of import and export tariffs, free trade agreements (Mercosur and WTO) Price stabilisation, reduction of barriers to trade, privatisation and deregulation of markets Dissolution of National Commercial Boards (1991) Creation of animal and plant health and food safety SENASA (1996) Creation of the seed regulatory institution INASE (1991)
2002-2015	Return to a closed economy	Implementation of export taxes, import restrictions, value chains subject to regulations as export quotas and price controls at the retail level The National Office of Agricultural Commercial Control (ONCCA) dismantled (2011)

Period	Framework	Changes in agricultural policies
2015-2017	Gradual shifts to open up the economy	Elimination of export taxes for all agricultural commodities, except reduced taxes on soybean exports Elimination and reforms to the Register of Export Operations ROEs (2015) Federal Agricultural Council (CFA) reformed (2017)
2018-	Reintroduction of export taxes	Export taxes established for all exports including agriculture in response to the economic crisis of 2018 Reintroduction of specific taxes on agricultural products and exchange rate controls since 2019

Prior to the economic crisis of 2001, producer support fluctuated around zero. With the reintroduction of export taxes and other trade restrictions after the 2001-02 financial crisis, the PSE turned negative due to substantial negative market price support and absence of any significant budgetary support to farmers. Negative producer support peaked with price spikes in world markets in 2008, reaching -51.6% of gross farm receipts. The reduction in export taxes in 2015 resulted in reductions of the negative support. While market price support continued to be negative, budgetary support to farmers remained limited and mainly in the form of subsidies for tobacco (Figure 4.4). Around 60% of total expenditures on agriculture in the last ten years financed general services to the sector. From 2007 to 2010, Argentina provided subsidies to food processors (primary consumers), to compensate for high prices of agricultural products.

Figure 4.4. Argentina: Level and PSE composition by support categories, 1997 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

In contrast to most countries covered by this report, producers of Argentina's main agricultural products are implicitly taxed through negative price support. Export taxes are by far the most important market

intervention and the major source of policy-driven transfers away from the agricultural sector in agricultural markets in Argentina. The Ministry of Finance designs and implements these export taxes whose rates are adjusted by decree. Additionally, quantitative export restrictions on maize, wheat and beef meat are implemented by the Ministry of Agriculture, Livestock and Fisheries. All these measures have had and continue to have major impacts by depressing domestic prices below international reference prices and creating negative transfers to producers.

To a limited extent, Argentina provides input subsidies, mostly in the form of implicit interest rate subsidies through preferential credit provided by Fund for the Financing of the Agricultural Sector (FINAGRO). These credits finance investment and working capital in the production of a range of commodities. The fund FONDAGRO created by the government in 2017 also finances investment in the sector at preferential interest rates, but its scope is limited. There are almost no other forms of budgetary support to Argentine producers. Small amounts of direct payments are provided as disaster assistance in response to extreme weather events, mainly droughts. There are no national direct payments for agri-environmental services, and few at provincial level. The Agricultural Provincial Services Programme (PROSAP), financed with loans by the Inter-American Development Bank (IADB) and managed by the Ministry of Agriculture, Livestock and Fisheries, invests mainly in large-scale agricultural irrigation infrastructure. Law 25080 on Forest Promotion provides grants and tax benefits to forest producers since 1998. Since 2019, an additional payment is paid to those enterprises that have forest certification (FSC and CERFOAR-PEFC) and implement environmental practices or enrichment of the native forest.

The Argentine legal framework on intellectual property rights on seeds dates from 1973, and was modified by later resolutions. Although the legislation considers no constraint on “own use” of seeds in Argentina, the INASE establishes certain requirements for the farmers’ rights or own use. This is particularly relevant for self-pollinating crops such as soybeans, wheat, cotton and rice, where seeds used by farmers are not produced by hybridisation, and farmers do not pay royalties for those. The National Institute for Seeds (INASE) sets conditions for farmers to benefit from this exemption and monitors its implementation. There is also a private extended royalty system under which farmers pay for certain varieties of seeds.

The Special Tobacco Fund (Fondo Especial del Tabaco - FET) provides a supplementary payment to market prices and other support to tobacco producers. Created in 1972, FET provides additional revenue to tobacco producers in the northern provinces of Jujuy, Salta, Misiones, Tucuman, Corrientes, Chaco and Catamarca. The fund is mainly financed by a tax of 7% on tobacco retail prices (excluding VAT) and directly managed by the Ministry of Agriculture, Livestock and Fisheries. The federal government transfers 80% of collected funds to tobacco producing provinces proportional to their share of production. After the signature of the WTO agreement in 1994, Argentina committed to reduce this support as part of its Aggregate Measurement of Support (AMS) commitment. FET payments to tobacco producers shrank to USD 75 million, with the rest of the funds spent on technical assistance, to invest in local infrastructure, and to provide social and health assistance.

Most expenditure finances general services to the sector such as the agricultural knowledge and innovation system, or inspection control services. Research and development and extension services are mainly provided by INTA, while animal and plant health and input control services are provided mainly by SENASA.

Agri-environmental regulations are mostly decided at provincial level. Córdoba province has a Law of Good Agricultural Practices setting standards for sustainable agricultural production. This was the first regulation at a provincial level and is part of a Good Agricultural Practices Program launched by the Province in 2017. Compliance with the programme gives farmers access to lump-sum payments, with an annual budget of ARS 180 million (USD 2.9 million) in 2020. In 2021, the province of Santa Fe also started a Good Agricultural Practices Program. The province of Entre Ríos enacted a Law on Soil Conservation in December 2018. The new standard declares mandatory soil conservation for any area with soil degradation. Farmers are subject to mandatory conservation and management practices on up to 15% of

their production area. Compliance permits farmers temporary and partial exemptions from provincial rural property taxes. In the province of Buenos Aires, the BPA-Suelos Bonaerenses Program of 2020 supports extensive producers of crops to carry out crop rotation, practices reducing water and wind erosion, and develop a plan to reduce pesticide use.

The Biofuel Law, approved in 2006, established compulsory fuel blend mandates since 2010, starting at 5% and increasing to 10% for diesel and 12% for gasoline. The law was scheduled to end in May 2021, but in August 2021 the Argentine Congress passed a new Biofuels Law that reduces the mandated biodiesel blend rate from 10% to 5%.

Since 2016, Argentina is party to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) for the conservation and sustainable use of all plant genetic resources for food and agriculture, following guidelines of the Convention on Biological Diversity. The National Advisory Committee on Genetic Resources for Food and Agriculture (CONARGEN) co-ordinates public agencies on biodiversity issues related to the sector. The Application Authority of the ITPGRFA is in the Ministry of Agriculture, Livestock and Fisheries, whereas the Political Focal Point is in the Ministry of Foreign Relations, International Trade and Cult. The Instituto Nacional de Tecnología Agropecuaria (INTA) is developing projects supported by the Benefit Sharing Fund of the ITPGRFA and the Global Crop Diversity Trust.

The National Forest Management Plan with Integrated Livestock (MBGI) is a joint plan created in 2015 by the Ministry of Environment and Sustainable Development, the Ministry of Agriculture and the INTA. The MBGI develops technical guidelines for native forest management and livestock management in the framework of the Native Forest Law. There are Forest Good Practice Manuals in different provinces and two certification schemes for forest management, the Forest Stewardship Council (FSC) and the Argentine Forest Certification System (CERFOAR- PEFC). Almost half of the cultivated forest area is under one of these schemes.

Since January 2020, the social programme “Argentina Against Hunger” has provided financial support for children, pregnant women and disabled people. Support is channelled through an electronic food card (ALIMENTAR Card) to be used in any food product store. The food card is given to parents with children under 6-years old who receive the Universal Allowance per Child (AUH), pregnant women who receive the Universal Pregnancy Allowance (AUE), and people with disabilities who receive the AUH. The programme reaches around 1.5 million adult beneficiaries and 2.8 million children every year. Beneficiaries receive between USD 50 and USD 100 per month, depending on the number of children in the family.

Climate change mitigation policies in agriculture

The agricultural sector contributes up to 30% of GHG emissions in Argentina. Argentina’s second NDC in the framework of the 2015 Paris Agreement on Climate Change was submitted in December 2020 and updated in October 2021. Argentina is committed to an absolute, economy-wide and unconditional net emission limit of 359 $MtCO_2eq$ by 2030 – equivalent to a decrease of 19% compared to the peak reached in 2007. The tools Argentina employs to reach this goal are expansion of renewable energies (at least 30% of the total energy matrix will have to be from renewable sources by 2030), lower subsidies for fossil fuels, expanded protected areas, and improved efficiency in agriculture, industry, transport and construction. Argentina participates in the Global Methane Pledge initiative.

The National Plan for Agriculture and Climate Change is designed to comply with the objectives of the United Nations Framework Convention on Climate Change under the Paris Agreement. The plan includes mitigation and adaptation measures for the sector based on risk management. An inventory of greenhouse gases from agriculture, livestock and forestry plantations was completed to monitor and evaluate the sector’s emissions. As an important beef producer, Argentina faces a challenge measuring the linkages between the animal sector and GHG emissions to capture the differential impacts of grain-fed versus

Argentina's more predominant pasture-based cattle. Standard GHG inventories can underestimate the capacity of soils in grazing land to sequester carbon (Viglizzo et al., 2019[2]).

Argentina lost between 4 million and 8 million hectares of forest in the last 30 years; between 11% and 22% of its forest area in 1990. Deforestation rates decreased since 2007, estimated at 0.35% for 2014-15. The main driver is agriculture. Conversion of forests to farmland and pastures contributed 35% of the total GHG emissions from agriculture in 2014 (OECD, 2019[1]; Sy et al., 2015[3]; Fehlenberg et al., 2017[4]). The 2007 National Law of Native Forests, the 2015 National Forest Management Plan with Integrated Livestock (MBGI) and the Law for the Promotion of Forests are efforts to ensure good practices and curb deforestation.

The National Institute for Viticulture (INV) participated in the elaboration of the Self-assessment Protocol for Wine Sustainability of Bodegas de Argentina as part of the Methodological Guide for the Estimation of the Carbon Footprint in Wine. This guide offers a methodology to inventory GHG emissions along the entire value chain related to the production of Argentine wine. An additional guide for producers focuses on practices for self-evaluation of social and environmental sustainability.

The National Institute of Agricultural Technology (INTA) plays an important role in research and innovation to reduce GHG emissions from agriculture. It has a portfolio of research projects related to climate change mitigation and adaptation.[2] This includes: estimates of GHG emissions in agricultural systems; crop management and adaptation strategies of the systems to climate change; characterisation of the current climatic variability and vulnerability due to the effect of climate change; production strategies that increase carbon sequestration in the soil; management of native forests with integrated livestock; analysis of the dynamics of land use via optical remote sensing and radar; evaluation, monitoring and management of biodiversity in agricultural and forestry systems; monitoring of soil degradation; efficient use and management of water in irrigation systems; and survey of wetlands, sustainable production and use.

Domestic policy developments in 2021-22

In 2021, Argentina published the final results of the National Agricultural Census carried out in 2018 (CNA-18). The new census uses new technologies and innovative approaches to capture the scale of the structural transformations that have taken place in Argentine agriculture in recent decades. In particular, the diversity of new actors and service providers that play a crucial role without necessarily owning the land (Box 4.1). The information in the census can be valuable for improving policy making in Argentina.

Box 4.1. The new National Agricultural Census 2018 reveals far-reaching innovation and structural change

The publication of the final results of the CNA-18 in 2021 provides evidence of deep technological and organisational changes in Argentine agriculture. The previous agricultural census was carried out in 2008, but due to very low response rates it was not reliable for statistical analysis that had to be based on the 2002 census instead. CNA-18 is therefore an important source to provide a complete and exhaustive picture of the agricultural structures and the structural changes of the last two decades, filling significant information gaps. Technological change has driven new business models based on land rental and outsourcing of agricultural services. Agricultural activity has expanded from the Pampas (the core region) towards other regions, so-called regional economies, feedlots have also expanded and precision agriculture and livestock have spread.

The CNA-18 tried to measure the current complexity of the multiple activities related to land use including biofuels and other agro-industrial activities carried out on the farm, based on a diversity of technologies, business models, and profiles of agricultural producers. For that purpose, CNA-18 introduced conceptual innovations seeking to capture these structural changes, targeting not only agricultural production units but also companies that provide services, inputs, and technologies to agricultural producers that outsource several activities. The questionnaire included questions to capture

the increasing outsourcing of key activities, and the use of new and complex productive technologies, including smart farming and digital technologies, and organic, biodynamic, and ecological practices.

The results reflect the great complexity and heterogeneity in the technological and productive profiles and functional organisation of agriculture. The agricultural production units range from basic and traditional production forms to complex business ventures that use sophisticated technology, in particular digital and biotechnology applications. The census also reflects the co-existence of family farming with companies that constitute production conglomerates supported by investment funds that provide financial resources. Additionally, the results show a very dynamic network of complementary companies, services and technology providers for the agricultural production units, which play a prominent role without land ownership.

Finally, the CNA-18 applied new digital technologies for data collection, consistency, and management processes, implying that the necessary time for the completion of the CNA-18 was reduced, and the quality of the information improved. The results are published by the National Institute of Statistics and Census.

Source: https://cna2018.indec.gob.ar/.

Production and marketing practices

In April 2021, the Ministry of Agriculture, the Ministry of Productive Development and the Ministry of Labor determined that from 1 January 2022 bovine meat for retail may only be marketed in units resulting from the division of half carcasses into pieces not exceeding 32 kg. The objective is to increase quality and health standards and market transparency. An adaptation period of three months up to one year was agreed for meat packing plants to implement the new marketing standard. A livestock commission for good livestock practices, production and environmental standards (*Mesa de Trabajo Ambiental Permanente*) was created by the Ministry of Agriculture.

Animal and plant health and safety

SENASA, the main agency in charge of plant and animal health and food safety, took several decisions in 2021 related to the pig meat sector. The creation of the National Animal Health and Welfare Commissions for Swine and other animal species[3] aims to facilitate consultations with all stakeholders in the public animal health decision process and other public agencies. The National Service for Agri-Food Health and Quality established guidelines for swine production plants to be officially recognised as “free of diseases”. The recognition may be granted to those plants that comply with the standards of the World Organization for Animal Health (OIE) on compartmentalisation. The new regulation provides the necessary official guarantees for swine production according to the conditions required by importing countries, in relation to biosafety, traceability and health status. In November 2021, SENASA issued a national sanitary alert due to African Swine Fever (ASF) outbreaks in domestic pigs in the Dominican Republic and Haiti and its potential spread throughout the American continent. SENASA declared a sanitary alert throughout the Argentine territory. Existing prevention measures were strengthened in order to reduce the risk of entry, exposure and dissemination of the ASF virus.

SENASA also created the Programme for the Control of Residues and Contaminants in Products of Plant Origin Destined for Export within the scope of the General Coordination of Surveillance and Warning of Residues and Contaminants (COGVARC). The programme aims to establish a monitoring system, of sampling, analysis and diagnosis of residues and contaminants in products of plant origin destined for export.

Irrigation

The Ministry of Agriculture started a new Regional Plan for Irrigation Reservoirs in 2021. The plan includes a diagnosis of the situation of irrigation in San Juan and Mendoza and proposals for improvement in irrigation efficiency using water reservoirs for pressurised irrigation, promoting the construction and use of reservoirs for small and medium-sized producers. Other water deficit regions such as Patagonia are to be included in the next stage of the plan. The project is implemented by the Ministry of Agriculture, the Ministry of Economy, the Ministry of Productive Development and the Provincial Governments.

Biotechnology

The Argentine Agricultural Bio-inputs Program (PROBIAAR) was created in 2021 for small and medium-sized producers, to promote, encourage and strengthen the bio-inputs sector. The Argentine Bio-product Program modified the definition of bio-products with the objective to promote firms that innovate in biomaterials and bio-products. Three Argentine Bio-product labels were created: Argentine Bio-product Stamp Natwash, Argentine Bio-product Seal Bio-paints and Soltec Argentine Bio-product Seal. Additionally, three new initiatives from the Ministry of Agriculture promote bio-design, the local production of bioplastics, and, more generally, the emergence of local bio-developers.

Four genetically modified events were approved in 2021 in Argentina: glyphosate tolerant alfalfa, and three pest resistant and herbicide tolerant maize events.[4]

Risk Management

The Integral Risk Management Program (GIRSAR) aims to strengthen the resilience of the agro-industrial system, reducing the vulnerability and exposure of producers to climate and market risks, especially among the most vulnerable actors. During 2020 and 2021, the Loan Agreement signed with the International Bank for Reconstruction and Development (IBRD) included a new component called “Response to Contingency Emergencies” (CERC) to provide a tool to strengthen Argentina's capacity to respond to an emergency or natural disaster. The CERC is a contingent financing mechanism that will be structured as a new component of GIRSAR that allows rapid access to resources in the event of an emergency or natural disaster. The General Directorate of Sectoral and Special Programs (DIPROSE) is responsible for the operational management of the Program.

In the context of recovery from the COVID-19 pandemic, financing through the Central American Bank for Economic Integration (*Banco Centroamericano de Integración Económica* [BCIE]) was approved for the Program Post-Emergency Rural Recovery and Development in October 2021. The objective of the programme is to contribute to sustaining and consolidating agro-productive, agro-industrial and services activities that generate income and employment for the rural and semi-rural population. This programme will be implemented by the Secretariat of Food, Bioeconomy and Regional Development and is expected to begin in 2022.

In October 2020, the government declared a state of economic emergency for citrus production as a result of extreme climatic events and declining export markets. Over the course of one year, this allowed tax reductions and concessions to be provided to citrus producers in provinces of Entre Ríos, Corrientes, Misiones, Jujuy and Salta. In October 2021, the economic emergency was extended for another year and also extended to producers in the provinces of Buenos Aires, Catamarca and Tucumán.

Rural Development, family farms and indigenous agriculture

In August 2021, the Ministry of Agriculture created a special programme for the sustainability of small and medium agricultural firms (*Programa de Sustentabilidad de Agropymes*). The programme promotes the development, production, industrialisation, processing, commercialisation and distribution in the domestic

market and for export of small and medium-scale agricultural and agro-industrial food and by-products. The Ministry of Agriculture approved 32 projects for the sustainable and productive development of small and medium producers. The projects will be developed with municipal governments, private capital companies, co-operatives, producers and educational institutions for a total amount of ARS 782 million (USD 8.2) and focuses on strengthening and improving livestock, fruit and vegetables, dairy and non-timber forest product production processes.

The PROTAAL programme was created in 2020 to promote family farming and local supply of food. In 2021 the programme distributed ARS 481 million (USD 5.1 million) to 1 167 beneficiary families. Several other sectoral and special programmes invested in rural infrastructure and family farming. In 2021, the Provincial Agricultural Services Program (PROSAP) completed three investment projects and approved four major projects. Also, two national projects were approved for strengthening the National Service for Agri-Food Health and Quality (SENASA) and the National Institute of Seeds (INASE).

In 2021, the Economic Insertion Program for Family Farmers in Northern Argentina (PROCANOR) approved 215 projects for ARS 1 111 million (USD 11.7 million) including 3 618 beneficiary families. The Program for the Promotion of Resilient and Sustainable Agri-food Systems for Family Farming (PROSAF) supports sustainable, inclusive production and marketing systems for peasants and family farmers. The programme is financed by the International Fund for Agricultural Development (IFAD) and the Development Bank FONPLATA. The executing agency is the Ministry of Agriculture, Livestock and Fisheries, through DIPROSE and the Secretariat of Family, Peasant and Indigenous Agriculture.

The Ministry of Agriculture, Livestock and Fisheries proposed that the Program for the Development of New Irrigation Areas in Argentina would redirect its resources towards loans on projects of rapid execution to improve the reactivation of production and boost regional economies after COVID-19. The project financed by the Development Bank of Latin America (Banco de Desarrollo de America Latina, CAF), began in 2017 and changed its focus as reflected in the addendum to the loan agreement approved in November 2021. The aim of the project is to contribute to the development of regional economies and improve the competitiveness of the agro-industrial sector through improvements in rural infrastructure. DIPROSE is the implementing agency for the programme.

Biofuels

In August 2021, the Argentine Congress passed a new Biofuels Law, replacing the law which expired in May 2021. The new law reduces the mandated biodiesel blend rate from 10% to 5%, giving the Secretariat of Energy the authority to lower the blend rate further to a minimum of 3% if required by economic conditions. The new law mandates for bioethanol a blending rate of 12%, with the volume divided evenly between sugarcane and corn feedstock, with no change from the previous legislation. However, the Energy Secretariat now has the authority to reduce the volume coming from corn ethanol by up to half if necessary. This reduction of blending rates may have implications for the investment in the biofuels sector until the new law expires in December 2030.

Climate Change adaptation

In December 2021 the Smart Climate and Inclusive Agri-food Systems project was approved with a budget of USD 400 million financed by the World Bank.[5] The general objectives of the project are related to adaptation and resilience. It will invest in coverage and quality of rural public infrastructure; promote the sustainability of small and medium agri-food producers and their organisations through climate smart practices; and support the reorientation of the National Institute of Agricultural Technology (INTA) towards climate issues. The implementing agency is the Ministry of Agriculture, Livestock and Fisheries, through the General Directorate of Sectoral and Special Programs and Projects (DIPROSE). The project is expected to begin in 2022.

Trade policy developments in 2021-22

In December 2021, export taxes on selected agricultural products, such as peanuts, popcorn maize, seeds, prepared fruits and vegetables, oatmeal, rye, chickpeas, lentils, beans, pearled or crushed oatmeal, potato flakes, potato and cassava starch and organic products, were eliminated. The total export value of the tariff positions included in this elimination reaches USD 920 million. Export taxes re-instated in 2020 remain for main commodities: 33% for soybean, 33% for soybean products, 5% for maize flour, 7% for wheat flour, 7% for sunflower grain and oil, 12% for maize and wheat, 5% for milk products and 9% for beef. Export taxes on other products from outside the Pampas region, such as wine, pears, apples, grapes and, cotton are 5%. The government adjusts export tax rates by decree using a special authorisation from Congress based on “economic emergency” considerations since 2020. However, in December 2021 the ruling coalition was not able to pass the 2022 Budget Law in Congress, and the special powers delegated to the executive expired on 1 January 2022. This may imply maintaining the existing export tax rates without modifications until a new budget law is passed.

Exchange-rate controls in place since 2019 have resulted in a widening gap between the legal (so called official) exchange rate and the other market exchange rate. Due to these controls, agricultural exports need to be settled at the official exchange rate; the widening gap between the official and market rate in 2021 implies an additional reduction in the price received by farmers.

Since January 2021 maize and wheat exporters are required to comply with administrative export permits that are granted by the Ministry of Agriculture, depending on the quantity available and the price in the domestic market. Export quotas were not officially set but export permit requirements were in place. However, total exports of wheat and maize in 2021 were higher than in 2020 as recorded by the Argentine statistical institute INDEC. On 17 December 2021, the Ministry of Agriculture, Livestock, and Fisheries established a framework regulating exports based on a “volume of equilibrium of exports” (VEE) and limiting export permits. Going forward, the Ministry announced it will publish the VEE for maize and wheat based on the government's projection of production, domestic consumption and stocks. Exporters will be able to request export declarations (DJVE) for up to 90% of the VEE. Once this limit is reached, additional export permits will only be granted within 30 days of the expected exporting date.

In February 2021,[6] the government created a trust to subsidise domestic consumption of edible oils for a total amount of USD 190 million. The funds for the trust were provided by cereal exporters and exporting oil companies (CIARA-CEC) in function of their share in exports. In practical terms, the fund is financed by primary producers who receive an additional discount on the farm prices of soybeans, sunflower and maize. The trust provides subsidies to the 75% of total domestic consumption of edible oils (29 million litres/month). Plans for similar trusts are reportedly under consideration, including for users of wheat and maize, for the production of products such as wheat, pasta, and poultry.

In April 2021, the government imposed a stricter set of requirements for registering beef exports. In May 2021 beef exports were suspended for 30 days with the objective of limiting the domestic price increases. Since June 2021, the government banned the export of 12 categories of beef, mostly destined for domestic consumption.[7] The cuts not covered by the export restriction were subject to administrative export permits and minimum export prices. Agreed export quotas with the European Union and the United States are not covered by the export ban.

The government also reduced export duties on organic products. As from 15 January 2022, export duties for agro-ecological, biological and organic products duly certified were eliminated, and were reduced by five percentage points for wheat, soybeans and maize certified as organic.

Contextual information

Argentina is an upper middle income country with a dynamic agricultural sector that has been making a growing contribution to the GDP, from 4.7% of the GDP in 2000 to 5.9% in 2020. In contrast, agriculture's share of employment is decreasing and is currently well below 1%, due to a high degree of mechanisation of the production in the Pampas region, the major agricultural region. The country is one of the world's largest agricultural exporters, and agro-food exports have been growing significantly in the last decades, representing 41% of total exports in 2000, and 61% in 2020. In contrast, agro-food imports represent only 9% of total imports.

Argentina has abundant agricultural land representing almost 4% of the total agricultural area of all countries covered in this report, with a large share of this area composed of pasture land. The share of livestock in the total value of production was 39% in 2020.

Table 4.3. Argentina: Contextual indicators

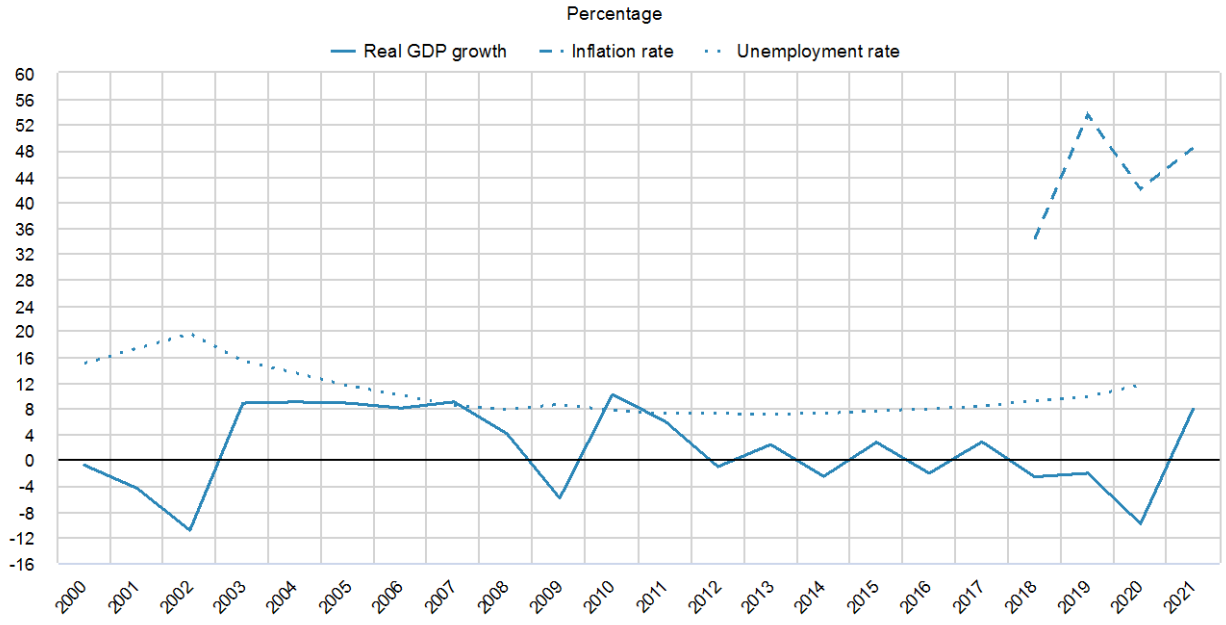
	Argentina		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	428	942	1.1%	0.9%
Population (million)	37	45	0.9%	0.9%
Land area (thousand km^2)	2 737	2 737	3.4%	3.3%
Agricultural area (AA) (thousand ha)	128 510	108 382	4.3%	3.7%
			All countries[1]	
Population density (inhabitants/km^2)	14	17	53	63
GDP per capita (USD in PPPs)	11 619	20 768	9,281	20,929
Trade as % of GDP	9	13	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	4.7	5.9	2.9	4.9
Agriculture share in employment (%)	0.7	0.1	-	-
Agro-food exports (% of total exports)	41.5	61.2	6.2	8.5
Agro-food imports (% of total imports)	5.4	9.0	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	59	61	-	-
Livestock in total agricultural production (%)	41	39	-	-
Share of arable land in AA (%)	22	30	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

The Argentine economy began to stall when the peso came under pressure in April 2018. The value of the peso vis-à-vis the USD was reduced by 40% in 2018, and by 70% in the period 2018-2021, and the economy plunged into recession and inducing annual inflation rates above 40%. Due to exchange rate controls, the electronic exchange market rate has diverged from the official rate. Adversely affected by COVID-19, GDP declined by 10% in 2020 but increased by 8% in 2021.

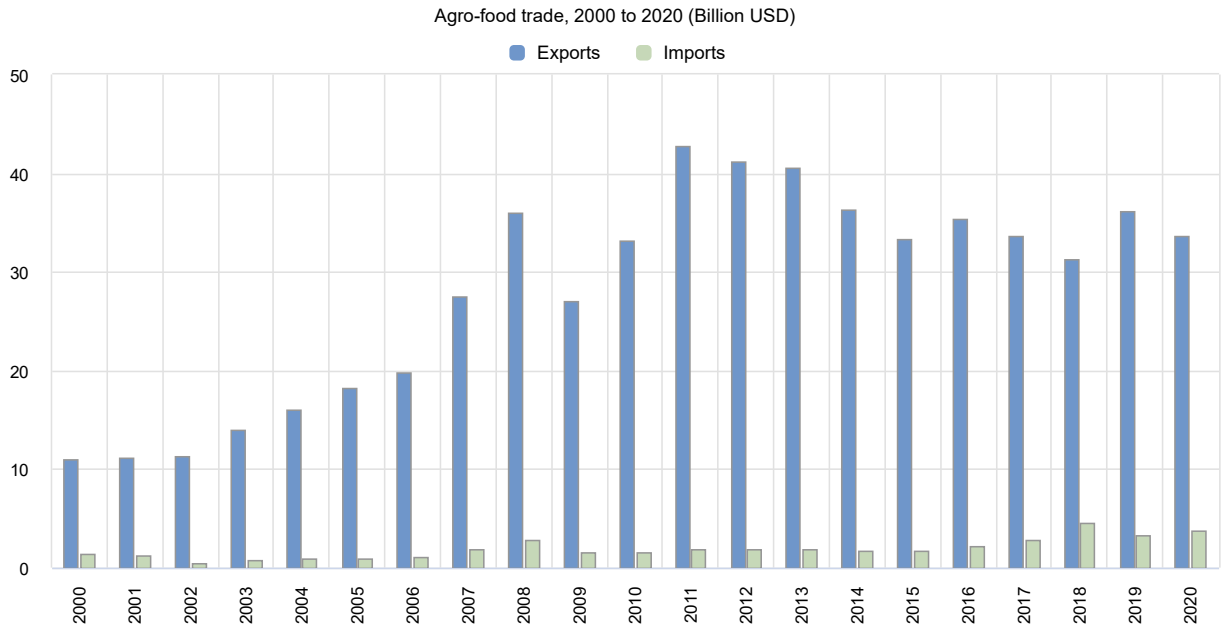
Argentina runs a significant agro-food trade surplus having exceeded USD 30 billion for most of the past decade. Most of agro-food exports (76%) are primary or processed products used as inputs in downstream industries abroad, whereas the much smaller bundle of agro-food imports is mostly composed of primary products for use by industry (59%).

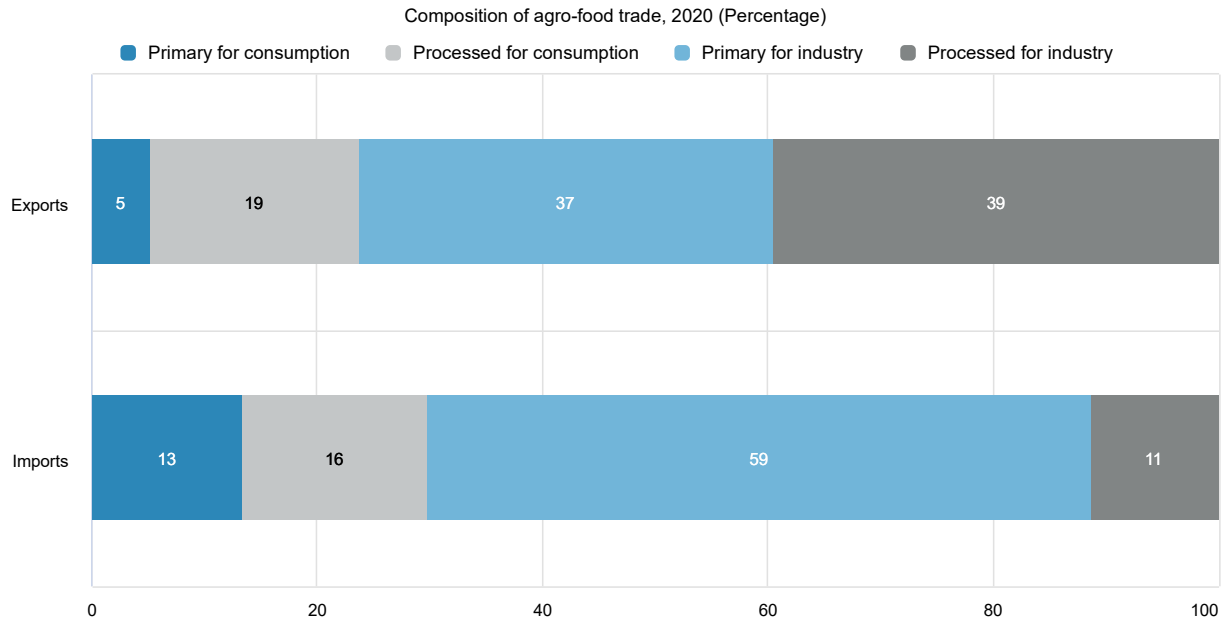
Figure 4.5. Argentina: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 4.6. Argentina: Agro-food trade



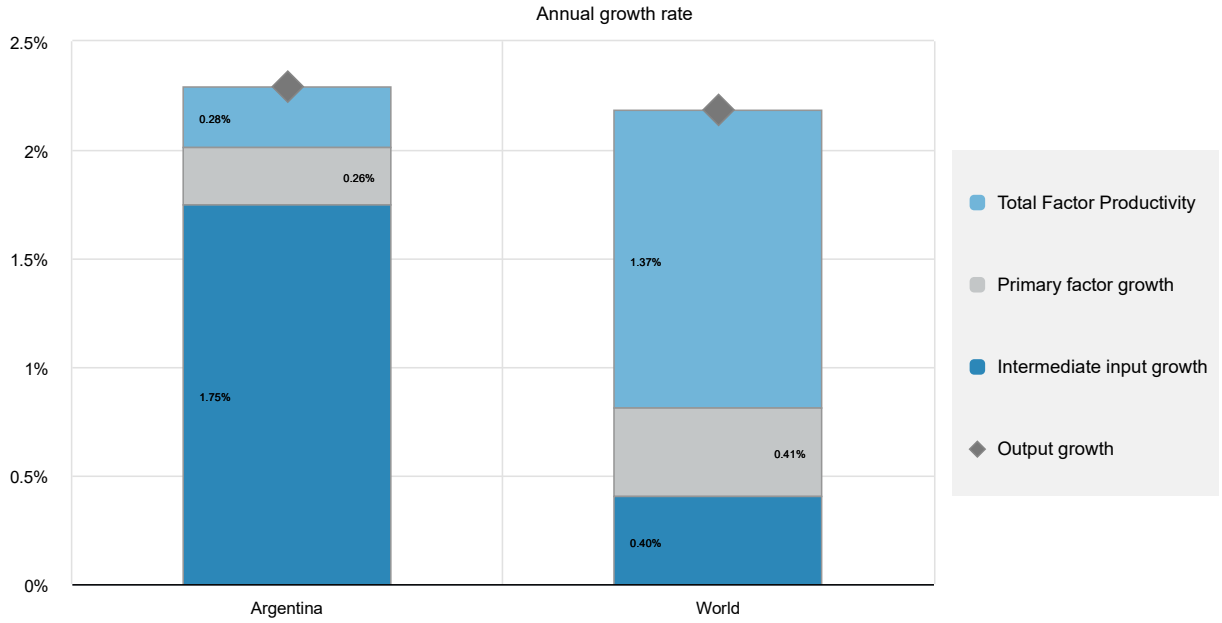


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Argentine agricultural production has grown at an annual rate of 2.3% between 2010 and 2019, similar to the world average. Within this total growth, 1.7% was due to an increased use of intermediate inputs, while only a small portion of production growth (0.3%) was due to Total Factor Productivity (TFP) growth, that is, innovations and technical improvements in the way resources are used in production. The contribution of TFP to production growth is below the world average.

Agricultural nutrient balances in Argentina are below the OECD average. The shares of agriculture in energy use and in greenhouse gas (GHG) emissions are, at 6.1% and 30.6% respectively in 2020, well above the OECD average, with the high emissions reflecting the large number of ruminants.

Figure 4.7. Argentina: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 4.4. Argentina: Productivity and environmental indicators

	Argentina		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	2.1%	0.3%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	-1.4	3.1	32.1	30.0
Phosphorus balance, kg/ha	1.7	2.2	3.4	2.9
Agriculture share of total energy use (%)	5.8	6.1	1.7	2.0
Agriculture share of GHG emissions (%)	40.5	30.6	8.6	9.7
Share of irrigated land in AA (%)	..	2.2	-	-
Share of agriculture in water abstractions (%)	71.4	73.9	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Mercosur is a free trade agreement among South American countries including large agricultural exporters such as Argentina, Brazil, Paraguay, and Uruguay.

[2] https://inta.gob.ar/paginas/proyectos.

[3] https://www.boletinoficial.gob.ar/detalleAviso/primera/252097/20211101.

[4] https://www.argentina.gob.ar/agricultura/alimentos-y-bioeconomia/ogm-vegetal-eventos-con-autorizacion-comercial.

[5] https://www.boletinoficial.gob.ar/detalleAviso/primera/254164/20211210.

[6] https://www.boletinoficial.gob.ar/detalleAviso/primera/240536/20210208.

[7] https://www.boletinoficial.gob.ar/detalleAviso/primera/245930/20210623.

5 Australia

Support to agriculture

Australia's support to agricultural producers (PSE) is among the lowest in the OECD, estimated at 3.1% of gross farm receipts for 2019-21, with total support to agriculture (TSE) representing 0.2% of GDP.

Market price support (MPS) to producers ended in 2000 and domestic prices for Australia's main agricultural outputs have been at parity with world prices since then. More than half of support to producers in 2019-21 was input subsidies. Much of these went to on-farm investments, including in response to adverse events. The bulk of remaining producer support (about 30% of the PSE) went to disaster relief payments, income support, and income-smoothing programmes that address cash flow fluctuations, such as the Farm Management Deposits and income tax averaging arrangements.

During 2019-21, the general services support estimate (GSSE) averaged 2.6% of the value of agricultural production, substantially higher than in the late-1980s (0.7%) and early 2000s (1.9%), but below the OECD average. Australia has an extensive agricultural knowledge and innovation system, with approximately one-quarter of total public expenditure for agriculture directed to support for R&D, innovation and extension services (compared with just 6% in the OECD). Public expenditure on biosecurity inspection and control services, and to develop and upgrade infrastructure (mostly hydrological) represents the bulk of the remaining expenditure on general services.

Recent policy changes

Australia launched the Delivering Ag2030 strategy in May 2021, which aims to support the sector in reaching AUD 100 billion (USD 75.1 billion) in farm-gate output by 2030. The strategy is centred around seven themes: trade and exports; biosecurity; stewardship of land and water; fair, strong and resilient supply chains; water and infrastructure; innovation and research; and human capital. In October 2021, the government released the National Agricultural Innovation Policy Statement, establishing four new priorities for agricultural innovation that target exports, climate resilience, biosecurity and digital agriculture.

Drought preparedness programmes were an important focus for the government in 2021. Additional funding was provided for climate information services under the Future Drought Fund, the development of drought indicators for a new early warning system, and the purchase and installation of on-farm water infrastructure to improve drought preparedness.

The Australian Government Roadmap to Attract, Retain, Upskill and Modernise the Agriculture Workforce was released in March 2021, followed by initiatives to improve employment opportunities in agriculture. The Australian Agriculture Visa was announced in August 2021 to address workforce shortages in the agricultural sector.

Increased funding for the Agriculture Biodiversity Stewardship Package will provide payments to farmers to protect, manage and enhance native vegetation; implement an Australian Farm Biodiversity Certification Scheme; and establish a National Stewardship Trading Platform to connect farmers with buyers of biodiversity outcomes. The Carbon + Biodiversity pilot is trialling a market-based approach to pay farmers

for biodiversity improvements on top of income they can earn from the Emissions Reduction Fund for carbon sequestration projects. The National Soil Strategy was launched in May 2021, setting out how Australia will value, manage and improve its soil over the next 20 years. The strategy accompanies the National Soil Package, which provides funding to support soil science, soil data and soil extension in 2021-25.

New support for biosecurity measures will invest in frontline measures to manage the risk of pests and diseases entering Australia (including African Swine Fever), modernise IT systems and data analytics, and improve abilities to detect and manage threats offshore. Funding also facilitates access to export markets, through the Dairy Export Assurance Programme and measures introduced in the context of the COVID-19 pandemic. These include the Busting Congestion for Agricultural Exporters Package, which simplifies export regulations and accelerates exporters' use of digital services, and the Agri-Business Expansion Initiative, which helps farmers maintain, diversify and expand their export markets. Additional funds were committed to revamp Australia's trade systems by simplifying regulations and establishing a one-stop shop for trade clearances. The International Freight Assistance Mechanism was extended to June 2022, with additional support to keep international supply chains open in the context of COVID-19 related trade disruptions.

The Regional Comprehensive Economic Partnership (RCEP) agreement entered into force in January 2022 between Australia, the Association of South East Asian Nations (ASEAN), the People's Republic of China (hereafter "China"), Japan, Korea and New Zealand. A new trade agreement with the United Kingdom was also signed in December 2021, and is expected to enter into force in 2022.

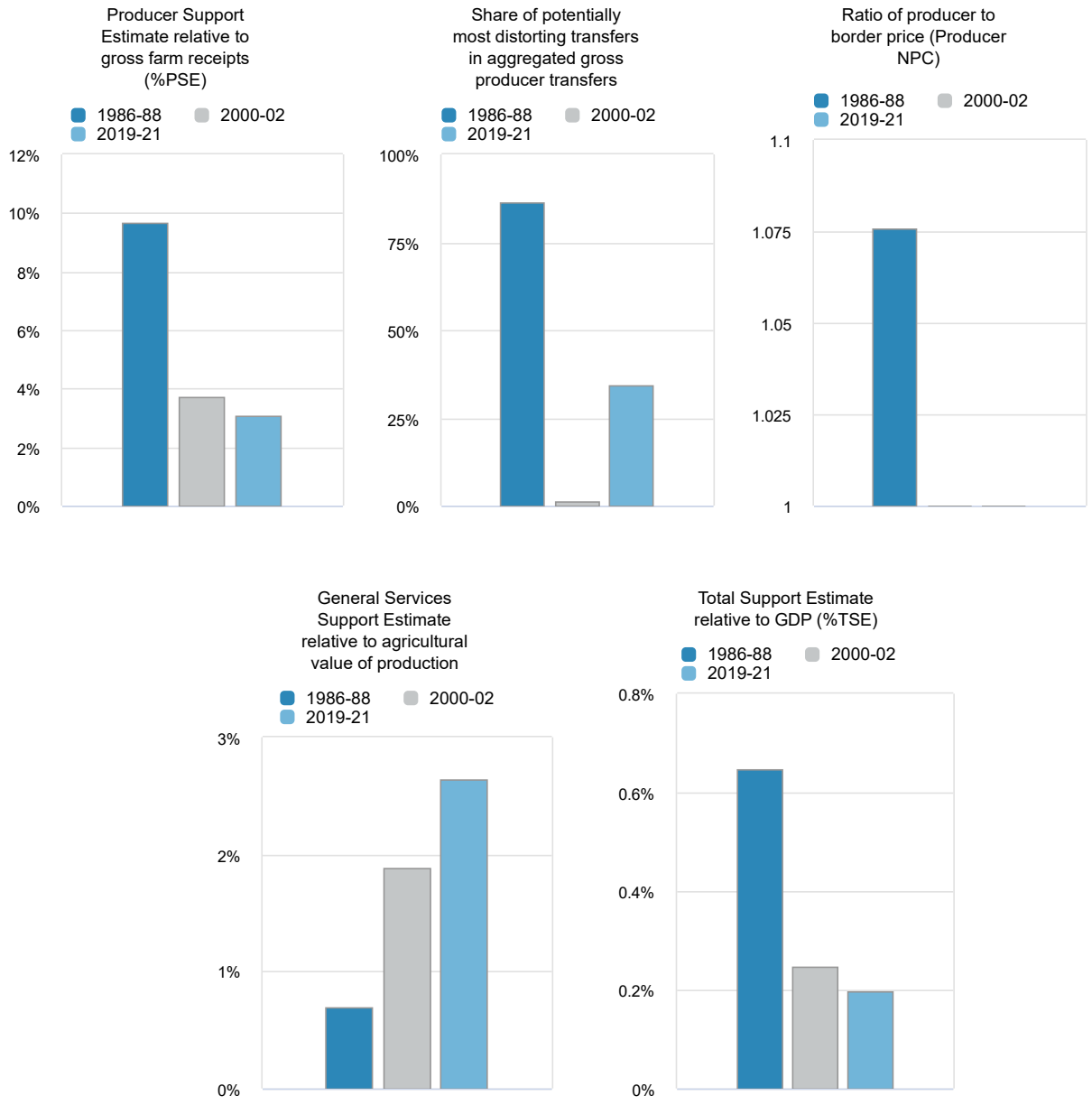
Assessment and recommendations

- Climate change creates growing challenges for Australian agriculture through increased variability of rainfall and temperatures, and greater frequency of extreme weather events. Agriculture accounts for 13% of Australia's greenhouse gas (GHG) emissions and can help the country to achieve its economy-wide target of net-zero emissions by 2050. While agriculture is included under Australia's economy-wide emissions reduction targets, setting specific targets for agricultural emissions can be helpful to focus mitigation efforts and measure progress. A stronger policy response will also be needed to reduce methane emissions, which represent 78% of Australia's agricultural emissions. Joining the Global Methane Pledge, a voluntary initiative signed by over 100 countries (including 29 OECD members) at COP26, would signal Australia's recognition of the need to reduce methane emissions by 2030 and would align well with ongoing efforts to lower livestock emissions.
- Funding to accelerate the development and commercialisation of technological solutions to cut emissions rightly focuses on reducing methane emissions from livestock. However, the extent to which these technologies can be feasibly deployed at scale to grazing cattle and sheep remains uncertain. To support the red meat industry's target of carbon neutrality by 2030, an effective policy mix (abatement subsidies, emissions taxes, standards and regulations) will be needed to create sufficient incentives for farmers to adopt new low-emission technologies.
- The Emissions Reduction Fund (ERF) supports projects to reduce or avoid GHG emissions (including agricultural emissions) or store carbon. In the absence of a national carbon pricing scheme, efforts to scale up the ERF (which so far has had a limited impact on agricultural emissions) could strengthen progress on mitigating agricultural emissions.
- While Australian Carbon Credit Units (ACCUs) enjoy a strong reputation both domestically and internationally, questions have been raised regarding the additionality of certain ACCUs, such as those generated by human-induced regeneration and avoided deforestation projects. Efforts to

strengthen confidence in the transparency and integrity of ACCUs will be essential to sustain confidence in the ERF and its ability to help Australia meet its emissions reduction targets.

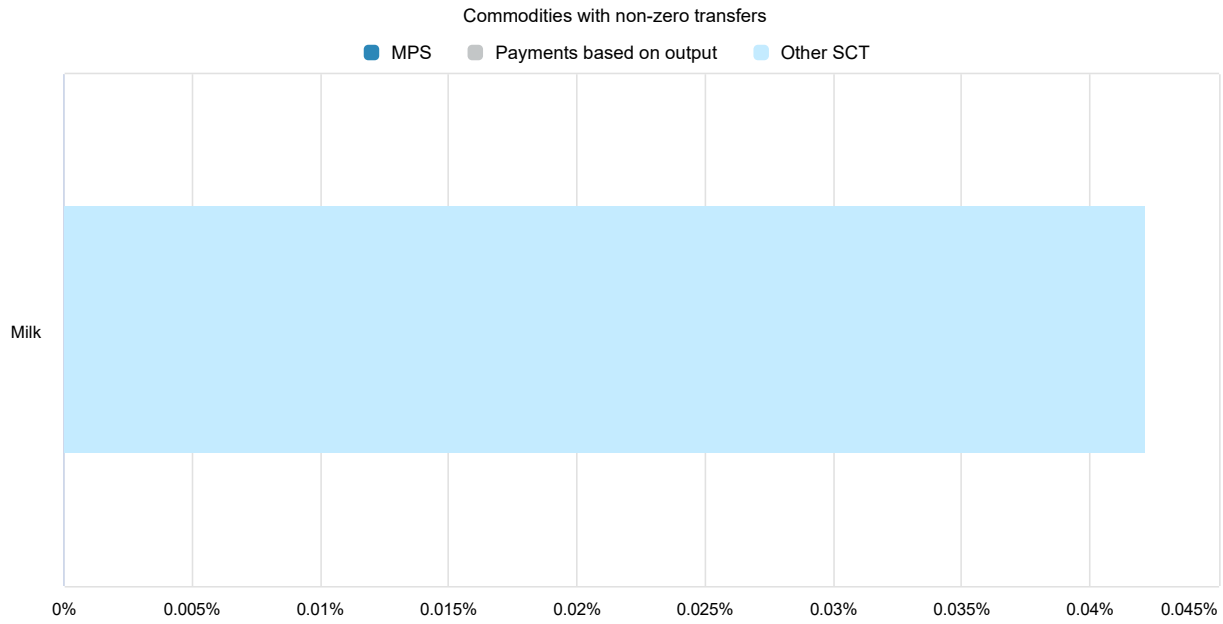
- Australia provides low levels of support to its agricultural sector. Policy settings are characterised by a strong emphasis on market openness, building resilience, and investments in public goods, including R&D, hydrological infrastructure and biosecurity.
- The government faces the formidable challenge of ensuring the continued economic viability of Australian agriculture in the face of growing natural resource constraints. The Drought Response, Resilience and Preparedness Plan launched in 2019 develops a holistic approach that builds long-term resilience and preparedness to drought while providing a safety net for farmers and communities facing financial hardship.
- Support also goes to upgrading hydrological infrastructure and improving water use efficiency at the farm level and in wider water management basins. Water recovery through infrastructure modernisation in the Murray Darling Basin should be closely linked to the achievement of enhanced environmental outcomes, while carefully accounting for the impacts of improved irrigation efficiency on increased water consumption and reduced return flows.
- Research and development are a major component of general services for the sector, while extension services and agricultural education receive smaller funding. The Future Drought Fund and the National Agricultural Innovation Agenda encompass innovation generation and adoption. Knowledge transfer services should receive continued consideration as they facilitate farmers' innovation uptake, which increases productivity and sustainability, and can build on-farm capacity to manage risks.

Figure 5.1. Australia: Development of support to agriculture



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 5.2. Australia: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 5.1. Australia: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**14 358**	**19 605**	**49 789**	**42 690**	**47 035**	**59 642**
***of which:** share of MPS commodities (%)*	82.36	74.30	75.19	71.69	75.31	78.57
Total value of consumption (at farm gate)	**5 072**	**7 514**	**19 826**	**22 906**	**17 090**	**19 483**
Producer Support Estimate (PSE)	**1 411**	**761**	**1 587**	**1 414**	**1 600**	**1 747**
Support based on commodity output	1 000	0	0	0	0	0
Market Price Support[1]	1 000	0	0	0	0	0
Positive Market Price Support	1 002	0	0	0	0	0
Negative Market Price Support	-2	0	0	0	0	0
Payments based on output	0	0	0	0	0	0
Payments based on input use	230	309	1 022	789	1 088	1 187
Based on variable input use	217	14	558	299	657	717
with input constraints	0	4	10	10	9	10
Based on fixed capital formation	4	145	324	331	307	335
with input constraints	0	0	5	6	4	4
Based on on-farm services	9	149	140	160	124	135
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	11	271	332	230	251
Based on Receipts / Income	0	11	271	332	230	251
Based on Area planted / Animal numbers	0	0	0	0	0	0
with input constraints	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	181	442	273	285	255	278
With variable payment rates	181	343	269	282	251	274
with commodity exceptions	0	110	103	149	76	83
With fixed payment rates	0	99	4	3	4	4
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	21	7	27	30
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	1	0	0
Based on other non-commodity criteria	0	0	21	7	27	30
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**9.65**	**3.74**	**3.10**	**3.21**	**3.29**	**2.85**
Producer NPC (coeff.)	**1.08**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Producer NAC (coeff.)	**1.11**	**1.04**	**1.03**	**1.03**	**1.03**	**1.03**
General Services Support Estimate (GSSE)	**98**	**370**	**1 312**	**1 011**	**1 398**	**1 527**
Agricultural knowledge and innovation system	95	252	707	695	682	745
Inspection and control	3	39	115	96	119	129
Development and maintenance of infrastructure	0	75	222	139	252	275
Marketing and promotion	0	4	257	68	337	368
Cost of public stockholding	0	0	0	0	0	0
Miscellaneous	0	0	10	12	9	10
Percentage GSSE (% of TSE)	**6.48**	**36.45**	**45.22**	**41.68**	**46.64**	**46.64**
Consumer Support Estimate (CSE)	**-513**	**-116**	**0**	**0**	**0**	**0**
Transfers to producers from consumers	-513	0	0	0	0	0
Other transfers from consumers	0	0	0	0	0	0
Transfers to consumers from taxpayers	0	-116	0	0	0	0
Excess feed cost	0	0	0	0	0	0
Percentage CSE (%)	**-10.12**	**-1.52**	**0.00**	**0.00**	**0.00**	**0.00**
Consumer NPC (coeff.)	**1.11**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Consumer NAC (coeff.)	**1.11**	**1.02**	**1.00**	**1.00**	**1.00**	**1.00**
Total Support Estimate (TSE)	**1 509**	**1 015**	**2 899**	**2 424**	**2 999**	**3 273**
Transfers from consumers	513	0	0	0	0	0
Transfers from taxpayers	996	1 015	2 899	2 424	2 999	3 273
Budget revenues	0	0	0	0	0	0
Percentage TSE (% of GDP)	**0.65**	**0.25**	**0.20**	**0.18**	**0.21**	**0.20**
Total Budgetary Support Estimate (TBSE)	**509**	**1 015**	**2 899**	**2 424**	**2 999**	**3 273**
Percentage TBSE (% of GDP)	**0.22**	**0.25**	**0.20**	**0.18**	**0.21**	**0.20**
GDP deflator (1986-88=100)	**100**	**149**	**253**	**247**	**250**	**263**
Exchange rate (national currency per USD)	**1.40**	**1.83**	**1.41**	**1.44**	**1.45**	**1.33**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Australia are: wheat, barley, oats, sorghum, rice, soybean, rapeseed, sunflower, sugar, cotton, milk, beef and veal, sheep meat, wool, pig meat, poultry and eggs.
Source: OECD (2021), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Before the 1980s, Australian agriculture was supported by a range of measures designed to maintain and stabilise farm income, and to provide farmers with support to offset the perceived disadvantages of remoteness. In 1980, Australia had 65 statutory marketing boards that used border protection through tariffs and import controls to divide domestic and international markets, and set higher prices in domestic markets (Table 5.2).

Price stabilisation schemes assisted export industries such as wheat, manufactured dairy products, sugar, and dried vine fruit. Other policy measures included fertiliser subsidies, income tax incentives, rural credit, subsidies for agricultural research and extension, and public investment in land and water development and rural infrastructure.

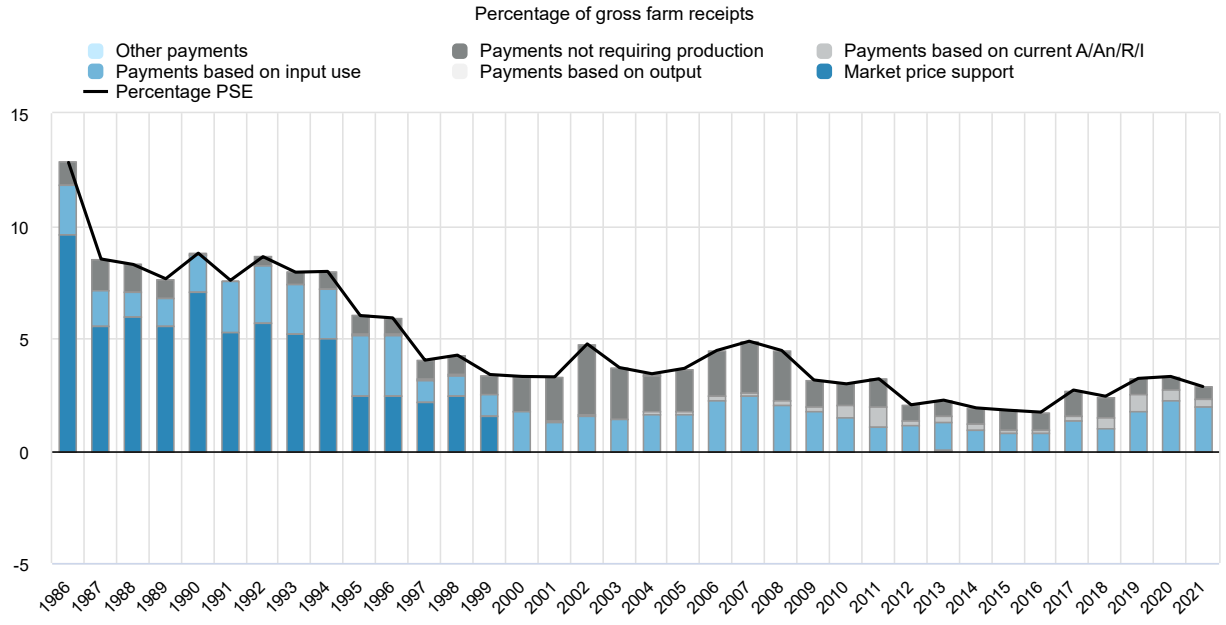
Australia's agricultural policy evolved significantly from the mid-1980s. Competition policy reforms in the 1980s and 1990s led to the removal of policies that distort agricultural production and trade. The National Drought Policy introduced in 1992 formalised the transfer of drought risk management to farmers and repurposed government support towards resilience-strengthening activities. Trade practices and anti-dumping legislation ensured competitive markets across the whole economy, reducing the need for sector-specific measures. Price stabilisation policies were relaxed, with price and output controls removed and centralised marketing schemes gradually dismantled (Gray, Oss-Emer and Sheng, 2014[1]). Tariffs were reduced. Floating exchange rates and trade liberalisation reduced price volatility in agricultural commodities.

Table 5.2. Australia: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1980s	Closed economy (interventionist agricultural policy)	High tariffs Production quotas Price controls Tariff protection and import controls carried out by 65 statutory commodity marketing boards
1980-Present	Reforms and trade liberalisation	Floating exchange rates Removal of agricultural price and output controls Gradual dismantling of Statutory marketing authorities Reduction of agricultural tariffs on both outputs and inputs Sanitary and phytosanitary (SPS) measures continue

In Australia, total support to the sector is composed of general services and budgetary payments to producers. Market price support disappeared since the late 1990s, and support to producers (PSE) was reduced to one of the lowest in the OECD. Current support is mostly delivered through payments based on inputs and payments not requiring production.

Figure 5.3. Australia: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2021), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Australia's agricultural sector is strongly market-oriented, and domestic and international prices are generally aligned. Support to agriculture comprises a mix of direct budgetary outlays, concessional loans and tax concessions. Direct support is provided to upgrade on-farm infrastructure that aims to improve the efficiency of natural resource use. Several programmes also support the development and uptake of farming practices to enhance sustainability, including through innovation take-up and pilot testing of certification schemes.[1]

Concessional loan schemes create incentives for investments in farm businesses, drought resilience and preparedness, plantations and farm succession arrangements. Income stabilisation tools such as the Farm Management Deposits scheme and income tax averaging arrangements further strengthen farm preparedness. For producers experiencing hardship, regardless of the cause, there is the safety net of the farm household income support. This is supplemented with natural disaster assistance[2] provided through the Disaster Recovery Funding Arrangements that came into force in 2018. The Drought Response, Resilience and Preparedness Plan was released in 2019, and focuses on immediate action and support as well as long-term resilience and preparedness for farmers and communities affected by drought – including through the AUD 5 billion (USD 3.8 billion) Future Drought Fund launched in July 2020 (Australian Government, 2022[2]). Central and regional funding supports large-scale water infrastructure investments, and programmes support farmers and land managers in pest and weed control during drought.

Since 2018, the Regional Investment Corporation (RIC) administers the Australian Government's concessional farm business loans. Changes to the portfolio of concessional loans are described in the section on Domestic Policy Developments below.

In contrast to the low level of direct government support to farmers, research and development (R&D) programmes are a major component of Australian support to agriculture. A smaller portion of public expenditure goes to the development and maintenance of large infrastructures and inspection services, including pest and disease control activities. Industry and governments cost-share the eradication of pest and disease outbreaks, while trade-related costs of biosecurity and food safety inspection services are covered by industry.

Rural research and development corporations (RDCs) are one of the Australian Government's primary vehicles to support rural innovation. RDCs are a partnership between the government and industry created to share funding and strategic direction-setting for primary industry R&D, investment in R&D and subsequent adoption of R&D outputs. A levy system collects contributions from primary producers to finance RDCs, and the Australian Government provides matched funding for the levies, up to legislated caps.

Improving market transparency is also part of the government's assistance to the food sector. One example is the mandatory dairy code of conduct under the authority of the Australian Competition and Consumer Commission (ACCC), which came into force in January 2020 (Australian Government, 2019[3]).

Australia's agriculture is trade-oriented with sixteen comprehensive regional or bilateral free trade agreements in force.[3] Policies support access to export markets, including helping small exporters overcome market access barriers and costs associated with exports registration. Imports of agriculture and food products, on average, face lower tariff rates than non-agricultural goods (WTO, 2022[4]). A number of SPS measures are in place to manage pest and disease risks that could harm the sector and affect Australia's plant, animal and human health as well as Australia's environment more broadly. These SPS measures mean that several conditions are in place for imports of agricultural products and other goods from certain regions.

Climate change mitigation policies in agriculture

In 2019, GHG emissions from agriculture were 69.8 $MtCO_2eq$, or 12.8% of Australia's GHG emissions, excluding land use, land-use change and forestry (LULUCF). Methane (CH_4) is the largest component of agricultural emissions, accounting for 78% of emissions from agriculture, followed by nitrous oxide (N_2O) at 18.5%. Agricultural emissions decreased considerably over the past three decades, and were 17.8% lower in 2019 compared to 1990 levels.

Australia submitted its first Nationally Determined Contribution (NDC) under the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, committing to reduce economy-wide GHG emissions by 26-28% below 2005 levels by 2030. An update to the NDC submitted in December 2020 reaffirms this target and outlines Australia's technology-led approach to emissions reductions. An additional NDC update was submitted in October 2021, maintaining the same 2030 target and committing Australia to net-zero emissions by 2050.

The Department of Industry, Science, Energy and Resources is responsible for the Australian Government's emissions reduction strategies and policies. In 2021, the Department published Australia's whole-of-economy Long-Term Emissions Reduction Plan, which sets out the government's plan to achieve net-zero emissions by 2050. The Technology Investment Roadmap is a cornerstone of the plan, and aims to accelerate the development and commercialisation of new and emerging low-emissions technologies, including in the agricultural sector. However, specific emissions reduction targets for the agricultural sector have not been defined.

The Low Emissions Technology Statement (LETS) 2021 is the second annual statement released under the roadmap, outlining priorities for government investments in new and emerging technologies. One major focus is identifying technological solutions for reducing methane emissions from livestock. Over the next six years, Australia will direct AUD 30.7 million (USD 23.1 million) towards the development of innovative livestock feed technological solutions:

- The three-year, AUD 6 million (USD 4.5 million) Methane Emissions Reduction in Livestock Stage 1 (MERiL Stage 1) grants programme launched in May 2021 and is supporting trials of new livestock feed technologies that reduce emissions and could increase productivity from cattle and sheep. The programme provides grants of between AUD 500 000 and AUD 1.5 million (USD 376 000 to USD 1.1 million) to assess the emissions reduction and productivity benefits of these technologies.
- The five-year, AUD 23 million (USD 17.3 million) Methane Emissions Reduction in Livestock Stages 2 and 3 (MERiL Stages 2 and 3) programme will support development of low-emission feed supplement delivery technologies to reduce enteric methane emissions from grazing cattle and sheep. AUD 20 million (USD 15 million) is available for grants to develop and determine the feasibility of proposed delivery technologies (Stage 2 projects), and undertake large-scale trials to validate them and demonstrate emissions reduction and productivity impacts (Stage 3 projects).
- AUD 1.7 million (USD 1.3 million) helps to scale up production of the red seaweed *Asparagopsis* as a livestock feed supplement.[4] This includes an AUD 1 million (USD 0.75 million) Accelerating Commercialisation grant under the Entrepreneurs' Programme to scale up production and support the commercialisation of *Asparagopsis*, and an AUD 675 000 (USD 0.51 million) grant from the Commercialisation Fund to establish a processing and manufacturing facility for this product.

In addition, the government committed AUD 59 million (USD 44.3 million) over 10 years, with an additional AUD 210 million (USD 157.7 million) committed by industry and universities, towards a new Marine Bioproducts Co-operative Research Centre that will develop high-protein seaweed for use as a low-emissions livestock feed.

Bringing down the costs of soil carbon measurement to increase participation in soil carbon projects is a priority in Australia's Technology Investment Roadmap. The three-year AUD 50.7 million (USD 38.1 million) National Soil Carbon Innovation Challenge launched in October 2021 to identify and fast-track low-cost, accurate technological solutions for measuring soil carbon. This challenge will help industry and researchers achieve soil carbon measurement costs at below AUD 3 (USD 2.25) per hectare per year on average. The five-year AUD 7.9 million (USD 5.9 million) Soil Carbon Data Programme, announced in December 2020, supports partnerships between scientists, industry and landholders to improve soil carbon data and build confidence in low-cost alternatives for measuring and estimating soil carbon. The programme contributes to a nationally accessible soil data repository to support the development of soil carbon measurement technologies and enhance modelling used in the National Greenhouse Accounts.

The Emissions Reduction Fund (ERF), established in 2015 under the Carbon Credits (Carbon Farming Initiative) Act of 2011, is a voluntary scheme providing incentives for businesses to undertake emissions reductions and carbon sequestration projects that meet strict integrity requirements, including in relation to additionality. Agricultural landowners and farmers can earn income by generating Australian Carbon Credit Units (ACCUs) for every tonne of emissions reduced or carbon stored through a project, and selling these to the government or third parties. The ERF is administered by the Clean Energy Regulator, an independent statutory authority responsible for developing technical rules for emissions abatement activities and making emissions reduction purchases on behalf of the government. As of April 2022, the ERF had committed AUD 2.7 billion (USD 2 billion) through 14 auctions for a total of 217 $MtCO_2eq$ of abatement, including 15.2 $MtCO_2eq$ of agricultural emissions (of which just 1.1 $MtCO_2eq$ of abatement has been delivered so far).

The Carbon + Biodiversity Pilot, part of the ongoing Agriculture Biodiversity Stewardship Package, is trialling a market-based approach to pay farmers for long-term biodiversity improvements, on top of income they can earn from the ERF for carbon sequestration projects. Landholders are required to plant, manage and maintain their carbon plantings in line with biodiversity protocols developed by the Australian National University.

Box 5.1. Industry-led initiatives to mitigate agricultural emissions in Australia

The National Farmers' Federation (NFF) published a Climate Change Policy in August 2020, expressing support for an economy-wide aspiration of net-zero emissions by 2050. The NFF recognises the opportunity for Australian agriculture to contribute to national emissions reduction efforts through innovations that reduce the emissions intensity of production and enable farmers to participate in new markets for carbon and natural capital.

The Red Meat Advisory Council, a federation of Australian red meat and livestock national employer associations and commodity representative organisations, has set a target for the industry to be carbon-neutral by 2030. The initiative is set out in the Red Meat 2030 strategic plan, to be achieved through a combination of pasture-based carbon sequestration, enteric methane emissions reduction, reducing production, processing and consumption waste, and increasing use of renewables in the industry's energy mix.

Meat and Livestock Australia, the industry marketing and research body for the Australian red meat and livestock industry, set a target to be carbon neutral by 2030. The proposed approach includes a combination of emissions avoidance activities on farm, in feedlots and in processing facilities, plus on-farm carbon storage, integrated management systems, and leadership and capacity building.

Dairy Australia, the national services body for the Australian dairy industry, set a target to achieve a 30% reduction in GHG emissions intensity across the whole industry (to 0.70kg CO_2eq FPCM[1] by 2030, from a baseline of 1.03kg CO_2eq in 2015).

Australian Pork Limited, a producer-owned industry body, released a sustainability framework for 2021-2030 underlining the goal of achieving low GHG emissions and adopting "closed loop systems for carbon and water".

Australia's 15 Rural Research and Development Corporations (RDCs) established Agricultural Innovation Australia (AIA), a not-for-profit company to facilitate joint investment projects to tackle cross-sectoral challenges facing the industry. AIA's first investments will be in climate adaptation and resilience.

1. FPCM is milk corrected for its fat and protein content to a standard of 4.0% fat and 3.3% protein. This standard is used to compare milk with different fat and protein contents, and provide a common basis to evaluate milk production of different dairy animals and breeds.
Source: (NFF, 2020[5]); (RMAC, 2021[6]); (MLA, 2021[7]); (Dairy Australia, 2020[8]); (APL, 2021[9]).

Domestic policy developments in 2021-22

The Australian Government launched the Delivering Ag2030 strategy in May 2021, which aims to support the sector in achieving its ambitious goal of reaching AUD 100 billion (USD 75.1 billion) in farm gate output by 2030. The strategy is centred around seven key themes: trade and exports; biosecurity; stewardship of land and water; fair, strong and resilient supply chains; water and infrastructure; innovation and research; and human capital.

Preparing for drought continues to be an important focus for the government, primarily through the AUD 5 billion (USD 3.8 billion) Future Drought Fund, which provides AUD 100 million (USD 133 million) from the fund for investments each year to help farmers and communities build drought resilience. The Mid-year Economic and Fiscal Outlook 2021-22 (MYEFO) introduced new measures to address gaps identified in the *2020 Review of the Australian Government's Drought Response*. An additional AUD 7 million (USD 5.3 million) has been made available to support the continued delivery of the Climate Services for Agriculture programme, an important element of the Future Drought Fund that will expand climate information capabilities to support farmers and farming communities to understand how drought and other climate risks might impact them into the future. The government is also committing AUD 4.1 million (USD 3.1 million) to develop drought indicators as part of a new early warning system to help regional Australia better prepare for, manage and recover from drought. The On-farm Emergency Water Infrastructure Rebate Scheme was extended for a further 12 months, giving farmers impacted by drought until June 2023 to fully utilise the AUD 100 million (USD 75.1 million) in funding for the purchase and installation of on-farm water infrastructure for livestock and permanent plantings to improve drought preparedness.

A new concessional loan product was introduced through the Regional Investment Corporation (RIC) in January 2021. The AgriStarter loan supports sector entry as well as farm succession arrangements with loans of up to AUD 2 million (USD 1.5 million) from the overall AUD 75 million (USD 56.3 million) budget in 2020-21. In December 2021, the government extended the RIC's existing loan funding for a further three years to FY 2025-26, and expanded its eligibility criteria (from 1 April 2022) to include farmers that share or lease farming land.

The National Agricultural Innovation Agenda (NAIA), announced in September 2020, sets out a plan to modernise Australia's agricultural innovation system and support the sector in reaching its AUD 100 billion (USD 75.1 billion) target by 2030. In October 2021, the government released the National Agricultural Innovation Policy Statement, establishing four new National Agricultural Innovation Priorities that target exports, climate resilience, biosecurity and digital agriculture. Funding to support the new innovation priorities includes AUD 2.8 million (USD 3.7 million) for Agricultural Innovation Australia to develop strategies to attract investment. The government is also providing AUD 20 million (USD 15 million) in additional funding to the eight Drought Resilience Adoption and Innovation Hubs from 2021-22 to 2022-23. The new funding will allow the Hubs to expand their current remit of drought resilience to broader agricultural innovation by delivering activities that support uptake of innovation by producers, stimulate collaboration and increase commercialisation outcomes. In addition, the agricultural innovation sharing digital platform growAG was launched in April 2021, allowing participants across the agriculture innovation system to showcase their research and technologies to the world.

The Australian Government Roadmap to Attract, Retain, Upskill and Modernise the Agriculture Workforce was released in March 2021, in parallel with the National Agriculture Workforce Strategy that was developed by the independent National Agricultural Labour Advisory Committee. The strategy contains 37 recommendations and highlights the need to modernise agriculture's image, attract and retain workers, embrace innovation, build skills for modern agriculture, and treat workers ethically. The Australian Government Response to the National Agricultural Workforce Strategy was released in December 2021.

Several initiatives were launched as part of the 2021-22 budget package to improve employment opportunities in agriculture. AUD 25.2 million (USD 18.9 million) is provided over four years from 2021-25 for the AgATTRACT package, which aims to attract and retain a skilled agricultural workforce, shift perceptions of agricultural work and showcase the diverse career opportunities on offer. This includes AgCAREERSTART, a pilot structured employment programme to give young Australians a way to experience work in agriculture, and the AgUP grants programme, which provides co-financing for industry-led initiatives to support upskilling and develop career progression pathways. The AgFAIR package provides AUD 4.6 million (USD 3.5 million) over four years to help agricultural employers adopt best practice workforce management and planning practices, and to better attract and retain employees.

The total investment in the ongoing Agriculture Biodiversity Stewardship Package has increased to AUD 66.1 million (USD 49.6 million). The 2021-22 budget delivers an additional AUD 32.1 million (USD 24.1 million) in new funding to promote biodiversity stewardship, including:

- AUD 22.3 million (USD 16.7 million) for on-farm trials of the Enhancing Remnant Vegetation Pilot, providing payments to farmers under a long-term agreement to protect, manage and enhance native vegetation by installing fencing, weeding, pest control and replanting.
- AUD 5.4 million (USD 4.1 million) to implement an Australian Farm Biodiversity Certification Scheme, allowing farmers to showcase best practice biodiversity management to communities and markets.
- AUD 4.4 million (USD 3.3 million) to establish a National Stewardship Trading Platform, enabling farmers to connect with buyers of biodiversity outcomes and kick-start private sector biodiversity markets. The platform will provide spatial planning tools to help farms plan and evaluate biodiversity and carbon services through a transparent marketplace.

The package also includes the Carbon + Biodiversity Pilot, which is trialling a market-based approach to pay farmers for biodiversity improvements on top of income they can earn from the ERF for carbon sequestration projects. Furthermore, in December 2021 the MYEFO announced AUD 13.2 million (USD 9.9 million) over 2021-22 to establish a Voluntary Biodiversity Stewardship Market. This will enable farmers who undertake biodiversity activities to gain access to new income streams whilst contributing to environmental outcomes. In February 2022, the government introduced the Agriculture Biodiversity Stewardship Market Bill 2022, establishing a legal framework to underpin a national voluntary agriculture biodiversity stewardship market.

The government launched the National Soil Strategy in May 2021, setting out how Australia will value, manage and improve its soil for the next 20 years. The strategy has three key goals: to prioritise soil health, empower soil innovation and stewardship, and to strengthen soil knowledge and capability. The AUD 215 million (USD 161.5 million) National Soil Package provides a road map to healthier soils, with measures to support soil science, soil data and soil extension over a four-year period from 2021-25. This includes AUD 5.9 million (USD 4.4 million) to implement the National Soil Strategy, AUD 67 million (USD 50.3 million) for the Food Waste for Healthy Soils Fund; AUD 54.4 million (USD 40.9 million) for the two-year Pilot Soil Monitoring and Incentives Programme; AUD 20 million (USD 15 million) for the Soil Science Challenge Grants Programme; AUD 18 million (USD 13.5 million) for soil extension activities via the National Landcare Programme's Smart Farms Small Grants initiative; and AUD 15 million (USD 11.3 million) to develop the Australian National Soil Information System (ANSIS). Funding was also allocated for a review of existing soil data, for the Enhancing Soil Education and Expertise initiative, and to develop the National Land Management Practices Classification System. This investment reflects the importance of ongoing actions to support Australia's soil as a natural asset that provides essential ecosystem, climate resilience and agricultural production services that support and contribute to Australia's economic, environmental, and social well-being.

The government has committed AUD 5.4 million (USD 4.1 million) over four years from 2021-22 under the Improving Market Transparency in Perishable Agricultural Industries programme. The programme will deliver workshops with perishable agricultural industries to understand their market transparency requirements, and deliver a subsequent grants programme to develop and implement tailored mechanisms to improve price and market transparency.

The December 2021 MYEFO also includes AUD 65 million (USD 48.8 million) of funding over four years from 2021-25 to build resilience in the horticulture sector by protecting crops from extreme weather events and fruit fly pests. This includes support for producers to purchase and install new horticultural netting, and funding for states, territories and industry to manage fruit fly pests through new post-harvest treatment infrastructure, upgrading quarantine stations, and investing in Sterile Insect Technique capabilities.

Domestic policy responses to the COVID-19 pandemic

Border closures resulting from the COVID-19 pandemic reduced Australia's agricultural workforce (in the past, overseas workers filled up to 50% of casual and contract labour positions). The government announced the Australian Agriculture Visa (AAV) in August 2021 to help address workforce shortages and facilitate labour mobility across Australia's primary industries. The visa will be available to skilled, semi-skilled and low skilled workers across a broad range of agricultural industries (including meat processing), and the fishery and forestry sectors. The AAV will supplement Australia's existing Pacific Australia Labour Mobility (PALM) scheme, which helps to fill labour gaps in rural and regional Australia by allowing businesses to hire workers from nine Pacific islands and Timor-Leste when there are not enough local workers available.

Trade policy developments in 2021-22

Australia's trade policy seeks further market opening through multilateral, bilateral and regional trade agreements (DFAT, 2022[10]). Recent developments were mainly related to progress in trade agreements, strengthening biosecurity, and facilitating access to export markets in the COVID-19 context.

The Regional Comprehensive Economic Partnership (RCEP) agreement entered into force on 1 January 2022. Australia ratified RCEP on 2 November 2021 and was an original party to the agreement along with Brunei Darussalam, Cambodia, China, Japan, Laos, New Zealand, Singapore, Thailand and Viet Nam. RCEP is a comprehensive free trade agreement that provides a single set of rules and procedures for Australian exporters to utilise preferential tariffs across the region.

The Australia-United Kingdom Free Trade Agreement (A-UK FTA) was virtually signed on 17 December 2021. The A-UK FTA is expected to enter into force in 2022, and will provide new and enhanced market access for Australian farmers and exporters of beef, sheep meat, wine, sugar, dairy, grains, horticulture and seafood. It will also facilitate the mobility of skilled workers between Australia and the United Kingdom and enhance technical collaboration on biosecurity, animal welfare and antimicrobial resistance.

Australia is currently engaged in FTA negotiations with the European Union (launched in 2018). Negotiations for the Australia-India Comprehensive Economic Co-operation Agreement launched in May 2011, were suspended in 2015, and re-launched in September 2021. Negotiations have been ongoing for an extended period with the Gulf Cooperation Council (GCC), and the Pacific Alliance[5] FTA. Australia also engages in the plurilateral Environmental Goods Agreement (EGA) negotiations, undertaken in conjunction with 45 other WTO member countries to reduce tariffs on goods that benefit the environment (DFAT, 2022[10]).

Launched in February 2021, the Dairy Export Assurance Programme (DEAP) provides AUD 14.78 million (USD 11.1 million) in investment over 3-5 years to assist dairy manufacturers to become export ready. The programme supports the Australian dairy industry to enhance its competitiveness in global markets by building capacity, raising awareness, reducing regulatory hurdles, aligning food safety regulatory and commercial assurance, and reducing compliance burdens.

The Australian Standards for the Export of Livestock (ASEL) outline the minimum animal health and welfare conditions exporters must meet when exporting livestock. The standards are reviewed every three years to ensure that the standards remain fit for purpose and reflect the latest science. The latest version of the standards (ASEL 3.2) was published in November 2021.

Biosecurity is a key focus of the 2021-22 budget package, with over AUD 400 million (USD 300 million) in new funding allocated over four years to safeguard Australia from exotic pests and diseases. The package includes:

- AUD 84.1 million (USD 63.2 million) to invest in critical frontline measures to better manage the risk of pests and diseases entering Australia. This includes AUD 58.6 million (USD 44 million) to continue protecting Australia from the biosecurity risk posed by African swine fever.
- AUD 80.9 million (USD 60.8 million) to modernise ICT systems, technology and data analytics.
- AUD 235.1 million (USD 176.6 million) to improve the government's ability to detect and manage threats offshore and increase the capacity to respond to incursions, by strengthening partnerships with importers, companies, producers and the community.

The 2021-22 budget also delivers AUD 9 million (USD 6.8 million) under the Supporting Trade – extend the Improved Access to Agricultural and Veterinary Chemicals programme. The programme will boost farm productivity, strengthen farmers' responses to pests and diseases, and ensure competitive supply chains by expanding access to agricultural and veterinary chemicals. It gives farmers more options for trading their products, allows for better management of potential threats to Australian agriculture, and ensures long-term sustainable agricultural growth.

Trade policy responses to the COVID-19 pandemic

The onset of the COVID-19 pandemic saw a number of programmes introduced to facilitate access to export markets, including the AUD 328 million (USD 246.3 million) Busting Congestion for Agricultural Exporters package. Government support to access export markets was also reinforced with the Agri-Business Expansion Initiative announced in December 2020. In December 2021, several components of the initiative were extended for a further 12 months, with an additional AUD 13.2 million (USD 9.9 million) allocated to help Australian agribusinesses maintain, diversify and expand their export markets. This brings the total investment under the initiative to AUD 85.9 million (USD 64.5 million), of which around half is attributed to Austrade to support agri-food exporters to expand and diversify their export markets, with all components scheduled to end by June 2023. The initiative has expanded the Agricultural Trade and Market Access Co-operation programme (ATMAC), enabling the government to partner with industry associations and rural RDCs to improve Australia's access to overseas markets, by mobilising research, training, competitor analyses, market analyses, export strategy development, relationship development and capital works that support market diversification.

New funding for the expansion and diversification of exports was announced in the December 2021 MYEFO, with an additional AUD 137.7 million (USD 103.4 million) over four years committed to revamp Australia's trade systems by simplifying regulation, reducing duplication, and creating a one-stop digital shop for trade clearances. AUD 8.5 million (USD 6.4 million) was allocated to expand the use of Australia's export legislation to provide export certification to non-traditional agricultural products, starting with cosmetics. A further AUD 25.0 million (USD 18.8 million) will support agricultural shows and field days, and showmen and women impacted by COVID-19 restrictions.

The International Freight Assistance Mechanism was established in April 2020 to help keep international supply chains open during COVID-19. A further AUD 260.9 million (USD 195.9 million) in funding was announced in August 2021, bringing the total budget to AUD 1.04 billion (USD 781.1 million) and extending the programme to June 2022. The funding also supports domestic connections for producers and growers in regional and rural areas that rely on airfreight to get their products to existing markets.

Contextual information

Australia is the world's 18th largest economy in purchasing power parity (PPP) terms and the sixth largest country by land area, accounting for 12% of all agricultural land in the 54 countries included in this report, but only 0.5% of the total population of these countries. The country's GDP per capita is more than twice the average of the countries covered in this report (Table 5.3). Agriculture represents a small share of the

economy, accounting for just 2.4% of GDP and 2.5% of total employment in 2020. Australia is an important producer of agricultural commodities. In 2020, the country ranked as the world's second-largest producer of sheep meat and wool, the fifth-largest producer of beef, and is also among the world's top-ten producers of barley, oats, rapeseed and sugar cane.

Table 5.3. Australia: Contextual indicators

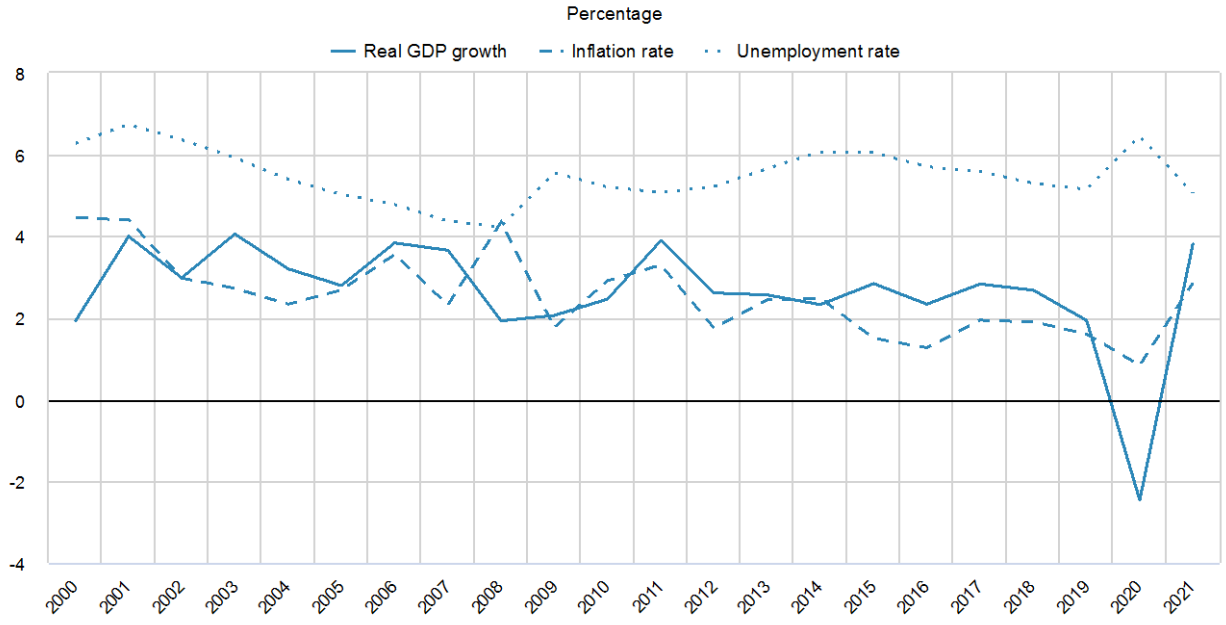
	Australia		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	539	1 404	1.3%	1.3%
Population (million)	19	26	0.4%	0.5%
Land area (thousand km²)	7 682	7 692	9.4%	9.3%
Agricultural area (AA) (thousand ha)	455 469	362 477	15.1%	12.3%
			All countries[1]	
Population density (inhabitants/km²)	2	3	53	63
GDP per capita (USD in PPPs)	28 305	54 654	9 281	20 929
Trade as % of GDP	17	16	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	3.8	2.4	2.9	4.9
Agriculture share in employment (%)	4.8	2.5	-	-
Agro-food exports (% of total exports)	23.1	12.3	6.2	8.5
Agro-food imports (% of total imports)	4.3	7.4	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	55	54	-	-
Livestock in total agricultural production (%)	45	46	-	-
Share of arable land in AA (%)	5	8	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

After 28 years of uninterrupted GDP growth, the COVID-19 pandemic brought Australia's economy to a halt in 2020. After a sharp contraction, real GDP growth rebounded to 3.8% in 2021, and the unemployment rate fell from 6.5% to 5.1% (Figure 5.4). Inflation also increased to 2.9% in 2021 as pandemic-related restrictions on economic activity were eased.

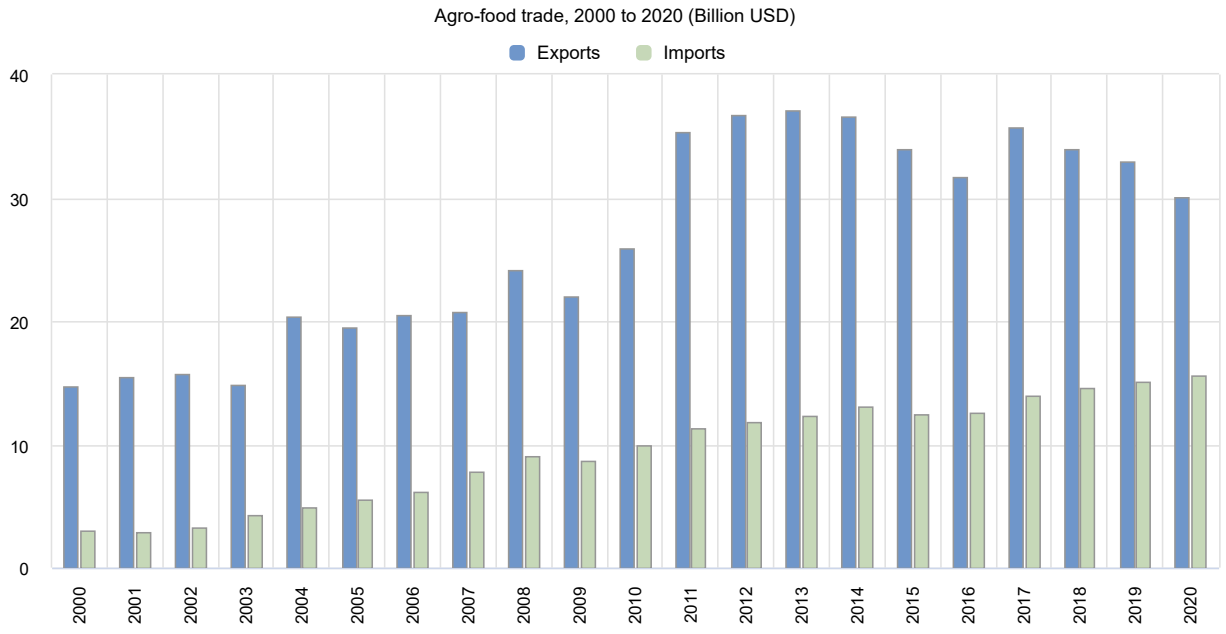
Australia is a net exporter of agricultural products and plays an essential role in supplying food to world markets. Seventy per cent of the value of agricultural production is exported, and Australian farmers produce enough food to feed an estimated 80 million people (DAWE, 2022[11]). Australia's agricultural sector is well integrated into world markets: the country is a major exporter of wheat, barley, oats, cattle, beef, sheep meat, wool, rapeseed, and chick peas. Processed goods for final consumption and further processing make up 60% of the country's agro-food exports. Approximately three-quarters of Australia's agro-food imports go to domestic final consumption and the remaining share (24%) is destined for the processing industry (Figure 5.5).

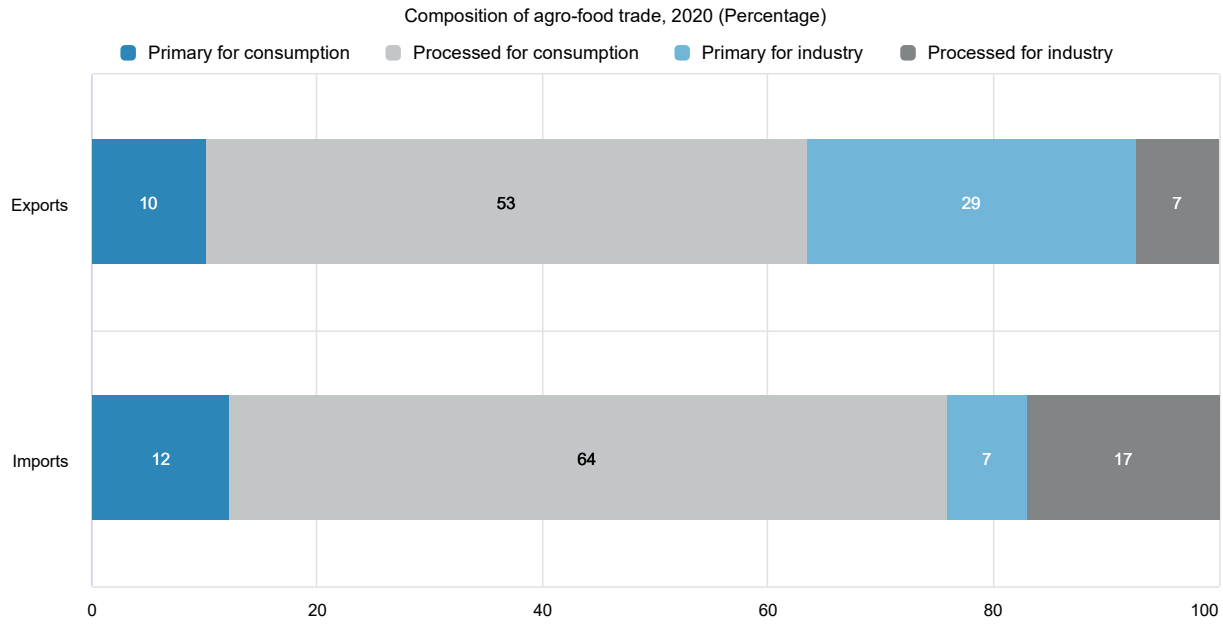
Figure 5.4. Australia: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 5.5. Australia: Agro-food trade



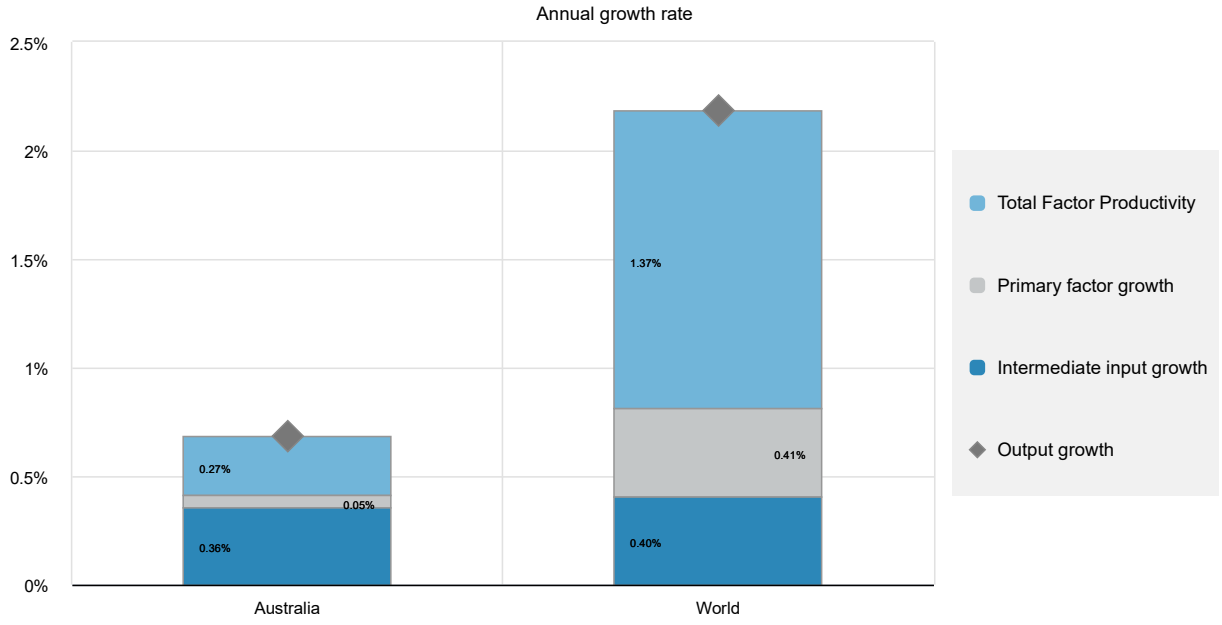


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Over the 2010-19 period, agricultural output grew at 0.7% per year, significantly lower than the world average of 2.2% (Figure 5.6). This was partly due to a slowdown in total factor productivity (TFP) growth, which reached 0.3% per year (compared with the global average of 1.4%), and fell short of the growth rate of 1.6% observed during 1991-2000. Primary factor growth was limited (0.05%), as capital growth was offset by declining contributions from land and labour. Water availability and competition for natural resources with other sectors is a particularly significant constraint, which is likely to be exacerbated by climate change.

The share of agriculture in total energy use has increased since 2000 and was above the OECD average in 2020, despite the small share of the sector in the economy (Table 5.4). Agriculture's contribution to GHG emissions has also declined, but remains above the OECD level, despite the smaller contribution to GDP. Compared to the OECD area, agriculture accounts for a relatively high share of total water abstractions. Aggregate indicators also suggest that water stress is much less of a problem than in many OECD countries. Estimates also indicate a relatively low nitrogen surplus balance and point to a low phosphorous balance.

Figure 5.6. Australia: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 5.4. Australia: Productivity and environmental indicators

	Australia		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.6%	0.3%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	20.7	19.4	32.1	30.0
Phosphorus balance, kg/ha	1.5	0.9	3.4	2.9
Agriculture share of total energy use (%)	2.3	3.2	1.7	2.0
Agriculture share of GHG emissions (%)	16.9	12.8	8.6	9.7
Share of irrigated land in AA (%)	0.5	0.4	-	-
Share of agriculture in water abstractions (%)[1]	67.7	67.0	46.3	43.7
Water stress indicator	5.4	3.6	9.7	8.6

Note: *or closest available year.
1. Data are not comparable between time periods, 2020 data from (Australian Bureau of Meteorology, 2021[12]).
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Examples include The Smart Farms program and Smart Farming Partnerships under the second phase of the National Landcare Program 2019-23 (https://www.awe.gov.au/agriculture-land/farm-food-drought/natural-resources/landcare/national-landcare-program/australian-government-investment-in-landcare) and the Agriculture Biodiversity Stewardship Package (https://www.agriculture.gov.au/about/reporting/budget/sustaining-future-australian-farming).

[2] Depending on the scale of the disaster, a range of assistance can be made available to primary producers impacted by natural disasters. For example, in the 2019-20 Black Summer Bushfires and 2022 NSW and Queensland floods, primary producers were eligible for AUD 75 000 (USD 56 300) clean up grants, concessional loans along with continued access to the Farm Household Allowance.

[3] These are agreements with New Zealand (ANZCERTA 1983), Singapore (SAFTA 2003), Thailand (TAFTA 2005), the United States (AUSFTA 2005), Chile (ACI-FTA 2009), the ASEAN-Australia-New Zealand Free Trade Area (AANZFTA 2010), Malaysia (MAFTA 2013), Korea (KAFTA 2014), Japan (JAEPA 2015), the People's Republic of China (ChAFTA 2015), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP 2018), Australia-Hong Kong, China (A-HKFTA 2020), Peru-Australia (PAFTA 2020), Indonesia-Australia Comprehensive Economic Partnership Agreement (IA-CEPA 2020), the Pacific Agreement on Closer Economic Relations (PACER Plus 2020), and the Regional Comprehensive Economic Partnership Agreement (RCEP 2022).

[4] A recent review of prospective feed technologies found a species of red algae (*Asparagopsis*) and a chemical inhibitor (3-nitrooxypropanol) have some of the largest mitigation potential, with recent on-farm trials indicating that over 80% of methane emissions can be avoided.

[5] The Pacific Alliance is a regional trading bloc comprising Chile, Colombia, Mexico and Peru.

6 Brazil

Support to agriculture

Brazil is a competitive agricultural exporter, reflected in its relatively high levels of exports and low levels of support and protection to the sector. Producer support as a share of gross farm receipts (PSE) fell from 7.6% in 2000-02 to 2.3% in 2019-21. Over the past five years, PSE fell both in nominal terms and as a percentage of gross farm receipts, however that trend reversed in 2021 when PSE rose due to an increase in market price support (MPS). Nevertheless, domestic prices almost fully align with international markets with a ratio of producer to border price (NPC) just above one. Support to producers also comes through input payments, in particular credit at preferential rates, and crop insurance. Concessional credit is available for farm marketing and working capital, but also for fixed capital investment.

The highest rates of single commodity transfer (SCT) go to maize, wheat, rice, and cotton. These products have experienced an increase in support from 2020 to 2021 due to increases in domestic producer prices via MPS for these crops, particularly maize. Since 2008, all support based on input use – mainly credit and insurance – is conditional on environmental criteria and specific farming practices.

Around 90% of support to general services (GSSE) goes to agricultural research and development (R&D), technology transfer and extension services. However, expenditure on GSSE fell from 3.4% of agricultural value of production in 2000-02 to 1% in 2019-21, indicating that expenditures have not kept pace with the sector's growth. As a percentage of GDP, the TSE declined from 0.7% in 2000-02 to 0.4% in 2019-21.

Recent policy changes

The Ministry of Agriculture (MAPA) releases its Agricultural and Livestock Plan (PSA) every year. The plan defines the maximum resources and guidelines for policy instruments: (1) rural credit, (2) agricultural insurance, (3) commercialisation support, (4) the zoning programme, and (5) the minimum and reference prices for each production year. For the 2021-22 harvest, credit allocation was BRL 251.2 billion (USD 46.6 billion), an increase of 6.3% compared to 2020-21.

Resources for the ABC programme, which is part of the National Low Carbon Agriculture Plan (ABC Plan), doubled from BRL 2.5 billion in 2020 to BRL 5 billion (USD 927 million) in 2021. The ABC programme in 2021 created a credit line for bio-inputs and bio-fertilisers, renewable energy systems, and power generation from biogas and bio-methane. In 2021, PRONAF (the main smallholders' programme) incorporated a new credit line called Bio-Economia dedicated to agroforestry systems, bio-input production and rural tourism. At the same time, preferential interest rates for all agricultural credits increased between 2 and 4 percentage points. Rural insurance subsidies (PSR), which cover around 150 million hectares, increased by 34% between 2020-21 and 2021-22, from BRL 881 million to BRL 1.18 billion (USD 219 million).

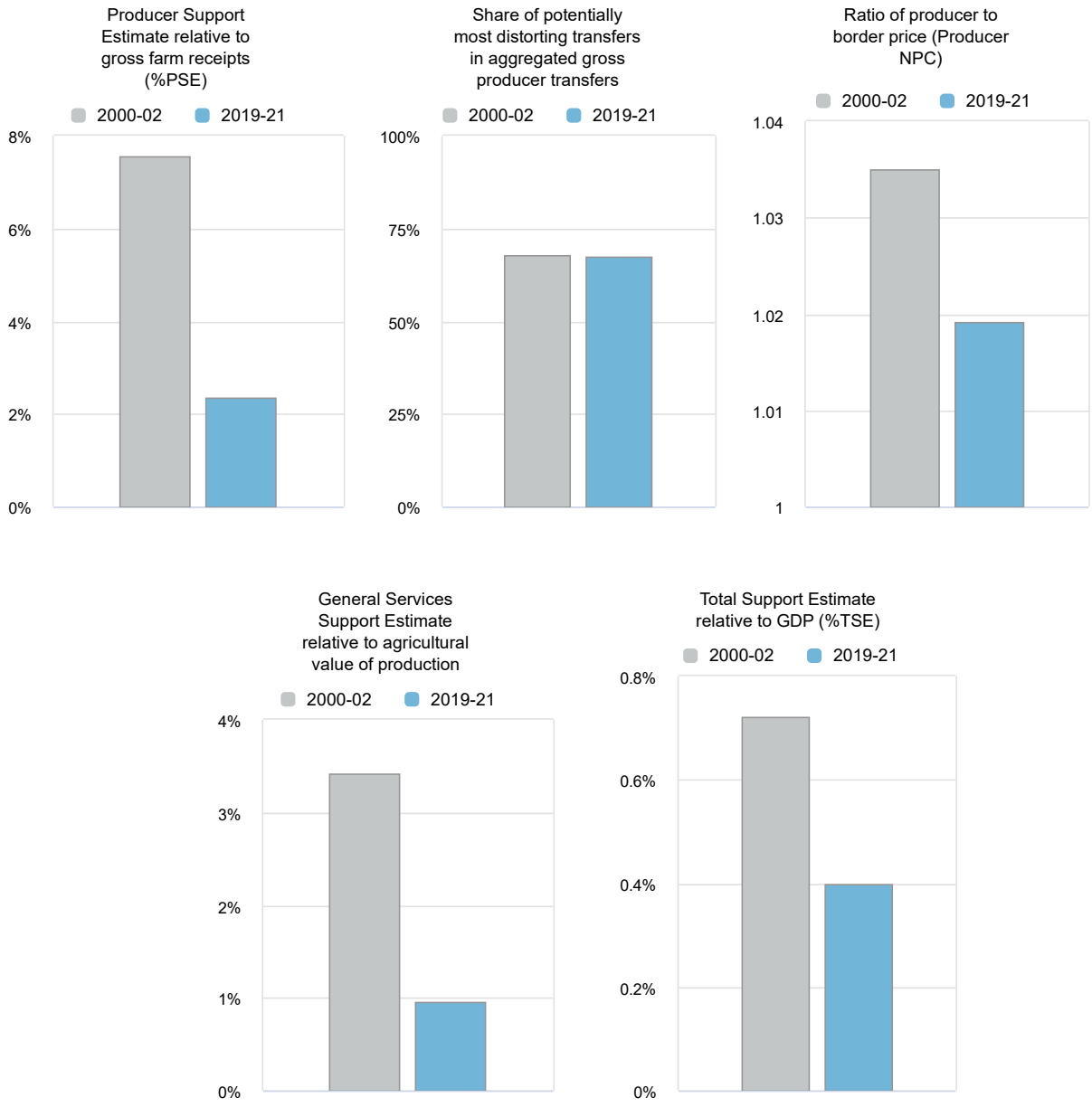
In 2021, Agricultural Risk Zoning (ZARC) continued with the implementation of ZARC 4.0, which integrates various technical risk data: agro-climatic, management, soils and indications of productivity losses. Thirty crops and production systems were reviewed by the ZARC by 2021. A digital platform (AGROMET) was

launched by MAPA in 2021 that compiles meteorological information and facilitates online access to climate services related to agriculture.

Assessment and recommendations

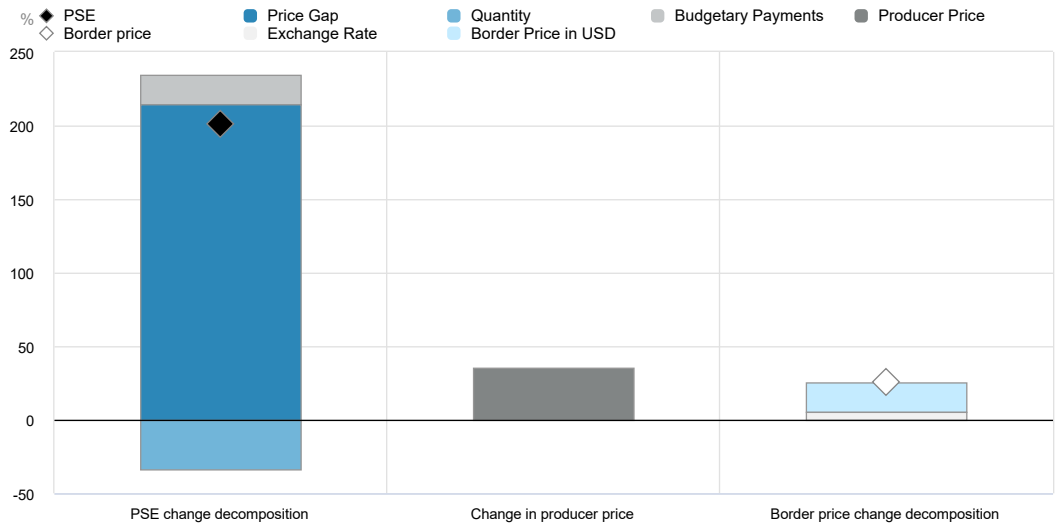
- Brazil's Nationally Determined Contribution (NDC) commits to reduce greenhouse gas (GHG) emissions 50% compared to 2005 levels by 2030 and achieve a long-term objective of climate neutrality by 2050. These economy-wide mitigation targets are not sector-specific. Since 2010, the country started incorporating agricultural, forestry and land use policies that contribute to climate change mitigation and adaptation. Sector-specific targets could help accelerate the low-carbon transition of agriculture, forestry and other land use (AFOLU) sector, and provide mitigation goals to measure progress. This is key given the important contribution of this sector in national GHG emissions equivalent to 43%.
- Agricultural credit at preferential interest rates represents a significant share of agricultural support in Brazil. The National Rural Credit System (NRCS) is based on compulsory quotas of bank deposits dedicated to rural credit. Reform of the concessional credit system could consider downsizing concessional loans for working capital to commercial farms. Simplified regulations and procedures for commercial credit could facilitate access by rural borrowers.
- Some credit programmes, such as Inovagro, Moderinfra and Moderagro, aim at innovation and technological modernisation of agricultural activities, contributing to increase productivity and may contribute to reduce emissions. Other credit lines for the financing of environmentally sustainable production systems are offered under PRONAF such as PRONAF-Agroecologia, PRONAF-Bioeconomia, FNE Verde, FNO Verde and FCO Verde. These credit programmes point in the right direction and can be improved and expanded. Moreover, the ABC Programme, which finances technological packages with a specific focus on mitigating emissions, is another step in the right direction, but only represents a small share of supported rural credit for achieving environmentally sustainable production systems and could be scaled-up.
- Insurance and credit support are conditional on environmental criteria and zoning rules that promote environmental improvements, such as preservation of forest and native vegetation. The impact of environmental conditionality set by the Environmental Rural Registry (CAR), the Agricultural Risk Zoning (ZARC) and the Forestry Code must continue to be assessed with respect to outcomes such as targets related to deforestation and GHG emissions. This should remain as the basis for improving policy design for environmental conditionality, and specific programmes such as the ABC and initiatives against deforestation. Moreover, insurance subsidy programmes require monitoring and evaluation. It is essential to strengthen the information base for these programmes while ensuring efficient use of public funds, monitoring their impacts and ensuring they do not crowd out market solutions.
- Budgetary support to GSSE is mostly invested in R&D, technology transfers and extension services. But these public outlays represent only 1% of the value of agricultural production. It is important to increase Brazil's significant research and extension capacity, notably through the Brazilian Agricultural Research Corporation (EMBRAPA) and increase the diffusion of innovations to medium- and small-scale farmers.

Figure 6.1. Brazil: Development of support to agriculture



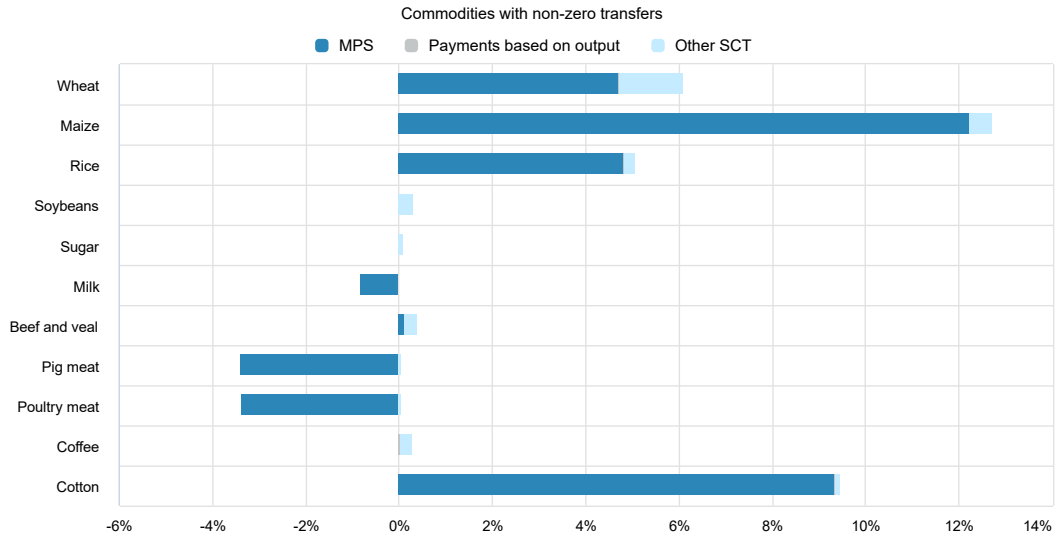
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 6.2. Brazil: Drivers of the change in PSE, 2019 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 6.3. Brazil: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 6.1. Brazil: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**35 538**	**166 052**	**147 878**	**149 777**	**200 503**
***of which:** share of MPS commodities (%)*	77.53	88.39	86.05	88.53	90.60
Total value of consumption (at farm gate)	**34 563**	**99 977**	**89 093**	**88 955**	**121 882**
Producer Support Estimate (PSE)	**2 869**	**3 814**	**2 282**	**2 362**	**6 798**
Support based on commodity output	1 013	1 947	63	862	4 917
Market Price Support[1]	973	1 944	56	860	4 915
Positive Market Price Support	1 179	2 685	56	1 021	6 979
Negative Market Price Support	-206	-741	0	-161	-2 064
Payments based on output	40	3	7	2	1
Payments based on input use	1 856	1 768	2 100	1 410	1 794
Based on variable input use	825	805	995	730	689
with input constraints	0	805	995	730	689
Based on fixed capital formation	955	944	1 083	661	1 087
with input constraints	0	944	1 083	661	1 087
Based on on-farm services	76	19	21	19	18
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	99	119	91	87
Based on Receipts / Income	0	99	119	91	87
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**7.56**	**2.35**	**1.52**	**1.56**	**3.36**
Producer NPC (coeff.)	**1.04**	**1.02**	**1.00**	**1.01**	**1.04**
Producer NAC (coeff.)	**1.08**	**1.02**	**1.02**	**1.02**	**1.03**
General Services Support Estimate (GSSE)	**1 242**	**1 634**	**1 969**	**1 487**	**1 447**
Agricultural knowledge and innovation system	663	1 533	1 808	1 414	1 377
Inspection and control	51	17	17	18	17
Development and maintenance of infrastructure	471	57	77	48	46
Marketing and promotion	5	2	4	1	1
Cost of public stockholding	53	25	63	6	5
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**29.78**	**24.80**	**37.47**	**31.73**	**15.99**
Consumer Support Estimate (CSE)	**-1 176**	**-385**	**872**	**-4**	**-2 023**
Transfers to producers from consumers	-1 175	-2 140	-56	-880	-5 484
Other transfers from consumers	-277	-94	-75	-140	-66
Transfers to consumers from taxpayers	31	880	1 004	838	800
Excess feed cost	245	969	0	179	2 727
Percentage CSE (%)	**-3.34**	**-0.52**	**0.99**	**0.00**	**-1.67**
Consumer NPC (coeff.)	**1.04**	**1.03**	**1.00**	**1.01**	**1.05**
Consumer NAC (coeff.)	**1.03**	**1.01**	**0.99**	**1.00**	**1.02**
Total Support Estimate (TSE)	**4 143**	**6 329**	**5 254**	**4 687**	**9 045**
Transfers from consumers	1 453	2 234	131	1 021	5 551
Transfers from taxpayers	2 967	4 188	5 198	3 807	3 561
Budget revenues	-277	-94	-75	-140	-66
Percentage TSE (% of GDP)	**0.72**	**0.40**	**0.28**	**0.32**	**0.56**
Total Budgetary Support Estimate (TBSE)	**3 169**	**4 385**	**5 198**	**3 827**	**4 129**
Percentage TBSE (% of GDP)	**0.55**	**0.27**	**0.28**	**0.26**	**0.26**
GDP deflator (2000-02=100)	**100**	**396**	**368**	**388**	**432**
Exchange rate (national currency per USD)	**2.37**	**4.83**	**3.94**	**5.15**	**5.39**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Brazil are: wheat, maize, rice, soybean, sugar, milk, beef and veal, pig meat, poultry, cotton, coffee.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Up to the 1990s Brazil had a history of government intervention in the agricultural sector. Price interventions were introduced in the 1940s amid food security concerns (OECD, 2015[1]; OECD, 2005[2]). From the 1950s, Brazil adopted an import-substitution industrialisation strategy, which involved wide-ranging controls over supply and prices in the agro-food sector. Prices were both supported for producers and subsidised to consumers.

The National Agency for Food Supplies (SUNAB) regulated distribution of basic foodstuffs and set prices and profit margins for all levels of the food chain, including low prices for consumers. This agency also controlled agro-food imports and exports. At the producer level, a general price support system existed for rice, maize, soybeans, beans, cassava, and cotton. Another government agency, the Company for Production Financing (CFP), carried out direct purchases of these commodities at minimum guaranteed prices. Marketing boards were created for wheat, sugar and coffee. They set overall production volumes, administered marketing quotas, and controlled prices and trade.

These policies continued until the late 1980s, when the government began to reform Brazil's economy. The economy began restructuring in the 1990s: trade was liberalised, state owned enterprises privatised, domestic markets deregulated and a customs union established with other South American countries (Mercosur). Agricultural policies were no exception to this move towards openness and less state intervention. State enterprises related to agriculture were dismantled or their functions reduced. Agricultural import tariffs were substantially reduced. Export licensing for primary agricultural products was removed. Brazilian producers faced fewer controls and obtained freer access to world commodity and input markets.

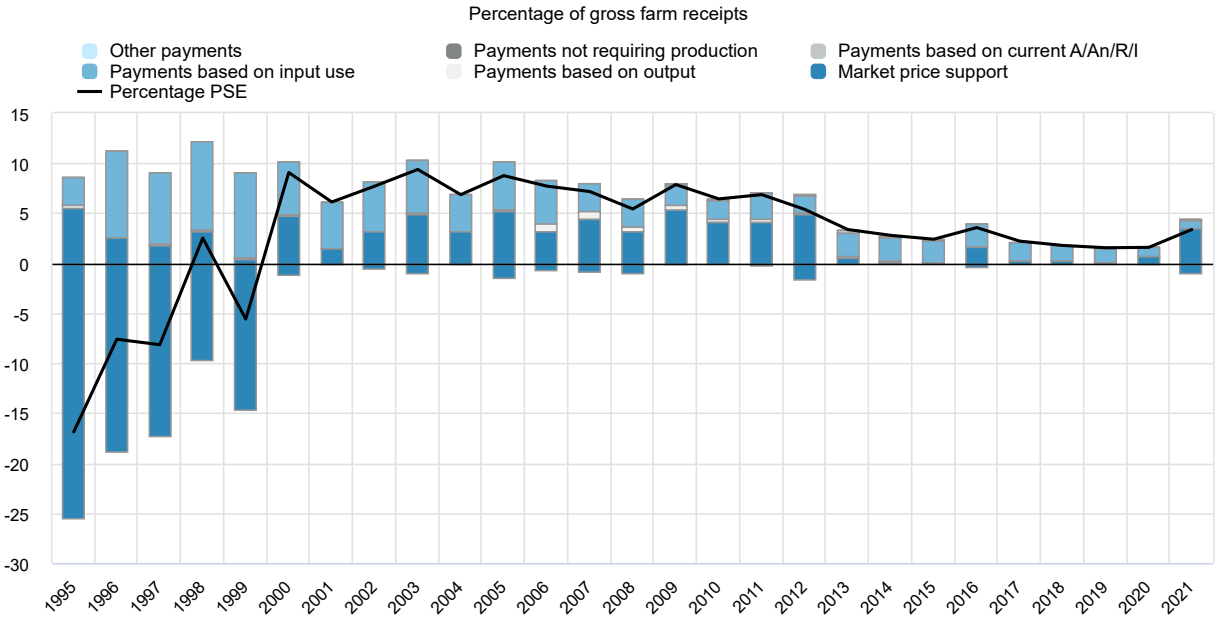
Since the mid-2000s, policy emphasised support to smallholders, and minimum prices for staples produced in the poorest regions of the country were established. The government enhanced purchases of staple foods to be distributed to poor populations, and mandatory sugar cane ethanol fuel-blending continued to be imposed at ratios set by the State. The government also instituted the National Program for the Production and Use of Biodiesel in 2005. The blending of biodiesel with mineral diesel became mandatory in 2008. Currently, the percentage of blending can vary between 6% and 15%. Biodiesel is sold through public auctions, where preference is given to manufacturers that support family farming: they prioritise the acquisition of raw materials as well as offering technical assistance to this public. All of these measures remain in place (Table 6.2).

Table 6.2. Brazil: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1990s	Import Substitution Industrialisation model Closed economy	Fixed exchange rates High agricultural tariffs Production and marketing control of agricultural products (CFP state company) Minimum agricultural prices for producers (CFP state company) Subsidised prices of agricultural products for consumers (SUNAB state company) Creation of the Brazilian Agricultural Research Corporation (EMBRAPA) Consumption of sugar cane ethanol stimulated through obligatory blending of ethanol with gasoline
1990-2005	Reforms to trade liberalisation	Floating exchange rates Removal of agricultural price and output controls Reduction of agricultural tariffs of both outputs and inputs Dismantling of marketing boards for wheat, sugar and coffee Dismantling of SUNAB and CFP WTO agreement and Mercosur signed Minimum prices of basic products kept but reduced Subsidised credits (working capital and marketing loans) enhanced as the financial crisis hit farmers Liberalisation of the wheat, coffee and sugar sectors Creation of the Ministry of Agrarian Development (smallholders) Consumption of sugar cane ethanol was also stimulated by the growth of the flex fuel vehicle fleet. Flex Fuel cars have represented more than 85% of new vehicle sales in Brazil since the late 2000s.
2005-2015	Continuing reforms	Subsidised agricultural credit and insurance subsidies as main agricultural policy, supported by the Law of agribusiness bonds 11076/2004. Minimum prices of basic products set for smallholders through government purchases of staple foods Sugar cane ethanol ratio policy continues to apply Government purchases of staples kept in order to provide food to poor populations Institutionalisation of the National Program for the Production and Use of Biodiesel. Current regulations of blending ranged between 6% and 15%.
2015-present	Institutional changes	Dismantling of the Ministry of Agrarian Development (Smallholders) and its reincorporation into the Ministry of Agriculture (MAPA) in 2019. Relatively low support, with subsidised credit continuing as key agricultural policy tool New competences of the Ministry of of Agriculture, Livestock and Supply includes small-scale family farming, agrarian reform, aquaculture, fisheries and forests

Brazil's support to agricultural producers included market price support and input subsidies in the 2000s, up to 10% of gross farm receipts. Market price support has gradually disappeared. In recent years, total support in Brazil is mostly in the form of budgetary support, in particular for producers' inputs and for the provision of general services. Consumer support is also an important part of support since the 2000s, particularly for vulnerable and poor populations. Brazil provides a relatively low aggregate level of support and protection to agriculture, reflecting its position as a competitive exporter and price maker for a range of commodities. Market price support is almost inexistent, and producer support is dominated by subsidised credit and insurance subsidies (Figure 6.4).

Figure 6.4. Brazil: Level and PSE composition by support categories, 1995 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Agricultural policy emphasis has not changed over the past decade, and has been characterised by the provision of: 1) rural credit, developed since the 1960s; 2) risk management programmes including subsidised insurance programmes introduced in 2005; 3) some minimum and reference prices and marketing interventions (e.g. government purchases of food); and 4) agricultural land zoning with environmental compliance and promotion of biofuels. The annual Agricultural and Livestock Plan (PAP) administered by the Ministry of Agriculture, Livestock and Food Supply (MAPA) defines the key parameters of agricultural policy. Small-scale family agriculture policy is now also managed by MAPA under the Secretariat of Family Agriculture and Cooperativism and the Secretariat of Agricultural Policy. Family agriculture was previously managed by the special Ministry for Family Agriculture and Agrarian Development (MDA) directly under the Presidency. Lastly, a key public policy in agriculture has been on innovation, R&D and extension services provided by the Brazilian Agricultural Research Corporation (EMBRAPA), created in 1973.

Brazil's agriculture has low price support overall. However, minimum guaranteed prices are used regionally, which cover a broad range of crops and a few livestock products such as cow and goat milk, and honey. These are set by the National Monetary Council (CMN) considering domestic and international prices, and the evolution of production costs in different locations. To secure these minimum guaranteed prices, the government implements several price support mechanisms on the domestic market, including direct government purchases (PAA programme), premiums to commercial buyers who pay minimum fixed prices to producers, and public and private options contracts backed by a private risk premium option. In addition, producers receive reduced-interest marketing loans, which enable them to withhold the sale of a

product in anticipation of a higher market price. The National Food Supply Agency (CONAB) operates these programmes on behalf of MAPA. Several programmes offer deficiency payments calculated as the difference between the market price and the minimum (reference) price (e.g. the Rural Equity Prize programme called PEPRO, and the Product Reward Prize programme known as PEP).

One of the main agricultural policy instruments is credit at preferential interest rates provided to commercial, medium and small-scale family farms. It is designed and implemented in co-operation between the Central Bank, the Treasury, the Secretariat of Economic Policy (Ministry of the Economy) and the Ministry of Agriculture. Most rural credit is allocated under the National Rural Credit System (SNCR) and provided at preferential interest rates with differentiated conditions for small farmers (PRONAF) and medium size farmers (PRONAMP) compared to commercial farms. The main sources of preferential rural credit are Compulsory Resources or lending quotas, equivalent to around 25% of sight deposits in commercial banks and 59% of Rural Saving deposits, Constitutional Funds and loans from the National Bank for Economic and Social Development (BNDES).

Additional sources of preferential rural credit are the Coffee Fund (FUNCAFÉ) and the Agribusiness Credit Notes called LCAs (*Letras de Crédito do Agronegócio*). These are fixed-income securities backed by credit transactions linked to agribusiness, of which 32% have to be allocated to rural credit at zero interest rates. Some support is provided through debt rescheduling arrangements that are set to end by 2022.

Agricultural insurance support is either in the form of insurance premium subsidies or by compensating farmers for production losses due to natural disasters. Two programmes target commercial farmers: the rural insurance premium programme (PSR) grants insurance premium subsidies to commercial producers who establish contracts with insurance companies listed by the government; and the general agriculture insurance programme (PROAGRO) that offers farmers with a partial compensation that incur on investment losses when using working capital loans. Most resources from this programme are allocated to the southern region for grain crops, mainly soybeans. Small-scale family farms can benefit from two other programmes: the PROAGRO-Mais or family agriculture insurance (SEAF); and the crop guarantee programme in the north-east of the country (*Garantía Safra*, GS).

Rural credit and subsidies insurance programmes have to comply with environmental criteria defined by the Environmental Rural Registry (CAR) a mandatory digital registration. Working capital credit is conditional on agricultural zoning of climatic risks Agricultural Risk Zoning (ZARC), which links agricultural support to farming practices and activities adapted for the environmental sustainability of each geographical zone. Compliance with zoning is also required to access PROAGRO programmes. Rural environmental registration of geo-referenced information on rural property, including property perimeters, location of Permanent Preservation Areas, Legal Reserves, Restricted Use Areas, and areas of agricultural production is compulsory across the country since 2012.

Lastly, some agricultural tariffs were reduced to curb food price inflation; and a temporary suspension of non-Mercosur import tariffs was established on soybeans, soymeal and soy oil until 15 January 2021, and on maize until 31 March 2021. Import tariffs were previously 8% for maize and soybean, 6% for soymeal and 10% for soy oil.

Climate change mitigation policies in agriculture

Agriculture in Brazil is a significant contributor of GHG emissions. The sector contributed 43.3% of national GHG emissions in 2020 and 76% of methane emissions in 2016. Brazil's NDC committed to reducing GHG emissions by 37% in 2025 and 50% in 2030 (i.e. 1.3 Gt CO_2eq), compared to 2005 levels (i.e. 2.6 Gt CO_2eq). This target includes emissions from land use, land use change and forestry (LULUCF), but no specific target relates to agriculture. Brazil's NDC sets an indicative long-term objective of reaching climate neutrality by 2050.[1] The country joined the Global Methane Pledge and agreed to take voluntary actions to reduce global methane emissions by at least 30% in 2030 from 2020 levels. Practical

implications of these commitments at the sectoral level are not yet known as Brazil's Long-Term Strategy remains to be submitted to the UNFCCC. Brazil also announced at COP26 it would end illegal deforestation by 2028.

Brazilian agricultural policies related to climate change, whether mitigation or adaptation, are embedded in the country's agricultural policy instruments such as credit, insurance and zoning. For example, credit provided by PRONAF such as PRONAF-Agroecologia, PRONAF-Bioeconomia, FNE Verde, FNO Verde and FCO Verde, incorporate mitigation and adaptation features.

However, Brazil's central initiative on mitigation in agriculture is the National Low Carbon Agriculture Plan (ABC Plan), which seeks to disseminate technologies that mitigate GHG emissions in agricultural production and promote adaptation to climate change. A key programme under this ABC Plan, with a strong environmental component on mitigation, is the Low Carbon Agricultural Programme (ABC Programme), providing credit to farmers for activities that reduce GHG emissions. The ABC Programme is subdivided into the following subprogrammes:

- Recovery of degraded pastures (ABC Recovery)
- Implementation and improvement of organic agricultural production systems (ABC Organic)
- Implementation and improvement of no-tillage systems in straw (ABC No-Till)
- Implement and improve crop-livestock, crop-forest, livestock-forest or crop-livestock-forest integration systems and agroforestry systems (ABC Integration)
- Implementation, maintenance and improvement of commercial forest management, including those destined for industrial use or charcoal production (ABC Florestas)
- Adequacy or regularisation of rural properties concerning environmental legislation (ABC Ambiental)
- Implementation, maintenance and improvement of waste treatment systems and waste from animal production for energy generation and composting (ABC Waste Treatment)
- Implantation, improvement and maintenance of oil palm forests, primarily in degraded productive areas (ABC Dendê)
- Encouraging the use of Biological Nitrogen Fixation (BNF) (ABC Fixation)
- Adoption of conservation practices for the use, management and protection of natural resources, including correction of soil acidity and fertility (ABC Soil Management)
- Construction of facilities for implementing or expanding bio-input and bio-fertiliser production units for agricultural and rural use.

Other important elements related to the ABC Plan are the Nationally Appropriate Mitigation Actions (NAMAs) on: 1) restoration of degraded pasture; 2) integrated crop-livestock-forest systems and other modes of agroforestry systems; 3) soil conservation with the use of no-till farming; and 4) biological nitrogen fixation. The ABC Plan also takes into account two strategic actions: 1) planted forest or reforestation, and 2) animal waste management. During 2010-19, the ABC Plan estimated a reduction of 166 million tonnes of CO_2 emissions. Lastly, since 2008, access to subsidised credit for agricultural production in the Amazon biome requires compliance with environmental regulations – in particular land use change regulations set out in the Forestry Code – with the aim of constraining land use change.

Climate change mitigation measures relate to production of biofuels, supported since the launch of the National Alcohol Programme (Pró-Álcool) and the Plan of Production of Vegetable Oils for Energy Purposes (Pró-Óleo) in 1975 with the idea of improving environmental performance and energy independence. The main tools are compulsory blending of gasoline and ethanol (mainly from sugar cane) and large-scale deployment of flex-fuel vehicles in the Brazilian car fleet. In addition, the National Programme for the Production and Use of Biodiesel (PNPB) from oilseeds launched in 2004 to offer a fuel alternative for heavy-duty vehicles. In 2017, the national policy initiative RenovaBio launched to foster the

implementation of GHG emission reduction commitments under the Paris Agreement on Climate Change by increasing the supply of alternatives to fossil fuels.

Domestic policy developments in 2021-22

Each year, MAPA releases its Agricultural and Livestock Plan (PSA). The plan defines the maximum resources and guidelines for main policy instruments: 1) rural credit; 2) agricultural insurance; 3) commercialisation support; 4) the zoning programme; and 5) the minimum and reference prices for each production year. For instance, for the 2021/22 harvest, total credit allocation was BRL 251.2 billion (USD 46.6 billion), an increase of 6.3% compared to the 2020/21 plan. The resources for investment credit represent 29.2% of the total, the rest being dedicated to working capital and commercialisation. Credit for small-scale farmers represents 15.6% (PRONAF) and for medium-size producers an additional 13.5% (PRONAMP), while 71% of the resources are dedicated to large scale producers.

For 2021/22, the available resources for the ABC Program doubled from BRL 2.5 billion in 2020 to BRL 5 billion (USD 927 million). In 2021, the ABC programme created new credit lines for bio-inputs and bio-fertilisers, removable energy systems, and power generation from biogas and bio-methane. PRONAF incorporated in 2021/22 a new credit line called *Bio-Economia* dedicated to Agroforestry systems, bio-inputs production, and rural tourism. Overall preferential interest rates of all agricultural credits increased from the 2020/21 to the 2021/22 harvest. For example, the PRONAF interest rate increased from 4% to 4.5%, PRONAMP from 5% to 5.5% and of the remaining credits from 6% to 7.5% or 8%.

Rural insurance subsidies (PSR) increased by 34% between 2020/21 and 2021/22, from BRL 881 million to BRL 1.18 billion (USD 219 million). This subsidy covers approximately 150 million hectares, benefiting 121 000 producers. Around BRL 53 million (USD 10 million) of this subsidy was reserved for the poor and isolated north and northeast regions.

Support for commercialisation for the 2021/22 harvest amounted to BRL 2.4 billion (USD 445 million), of which BRL 342 million (USD 64.4 million) was for private stock formation, BRL 630 million (USD 117 million) for price stabilisation, and BRL 1.4 billion (USD 260 million) for public stocks. The Minimum Price Policy (PGPM) for the 2021/22 harvest defined 27 products of regional and national production that include main grains, as well as 17 exotic products for the domestic market. In 2021, the PAA programme reached 31 000 farmers, of which 74% were women.

In 2021, the Agricultural Risk Zoning (ZARC) continued with the implementation of “ZARC 4.0” that integrates various technical risk data - agro-climatic, management, soils and indications of productivity losses. MAPA, EMBRAPA and the Central Bank signed an agreement providing funds for research on the ZARC programme, with the objective of expanding harvested areas and production systems in the country through new zoning. These funds also aim at modernising the information collection and methods to determine the most suitable planting periods, and minimising the risks related to adverse climatic events. By 2021, 30 crops and production systems were reviewed by the ZARC.

A digital platform (AGROMET) was also launched by MAPA in 2021 that compiles meteorological information and facilitates online access to different climate services related to agriculture. The Territorial Governance Platform (PGT) was also launched, which enables the integration of land registries aiming at reducing red tape. Moreover, 46 agricultural services became digital in 2021, including the service delivering International Veterinary Certificate for Brazilian trade partners such as Japan, Colombia, Canada, and Mexico, among others.

Domestic policy responses to the COVID-19 pandemic

In 2020 and 2021, the country provided a stimulus package of BRL 1.2 trillion (USD 233.8 billion) which then increased to BRL 3 trillion (USD 556.2 billion). The package included support for workers and the most vulnerable population, aids to states and municipalities, credit measures, keeping employment in

companies and fighting the pandemic disease. MAPA and the Ministry of Economy established a debt rescheduling and renegotiation of rural credit, which were implemented in 2020 and 2021. Specific measures were also put in place in 2020 and 2021 for the most vulnerable population, including farm households: a temporary transfer of a monthly allowance to unemployed and informal workers and the reinforcement of a cash transfer under the Family Aid Program (*Bolsa Família*).

Trade policy developments in 2021-22

The European Union and Mercosur free trade agreement involving EU Member States and the members of Mercosur (Argentina, Brazil, Paraguay and Uruguay) continues with its legal revision and public debate for its approval by the Parliaments of the European Union, its Member States and Mercosur countries.

Contextual information

Brazil is one of the ten biggest economies of the world and it is the largest country in Latin America in terms of area and population. The country's population accounts for 4.1% of the population of countries covered in this report. It has abundant land and water resources and is a major agricultural producer and exporter. The share of agriculture in Brazil's GDP increased from 5.5% in 2000 to 5.9% in 2020, while its share in employment decreased from 16.5% to 9.1% during the same time period. These shares remain higher than in most other countries covered in this report. Agro-food exports have grown in importance for Brazil, representing 41.7% of its total exports in 2020. Arable land accounts for 24% of Brazilian agricultural land.

Brazil is among the world's leaders in the production of soybeans, poultry, beef, cotton, corn, and orange juice, being the third biggest exporter of agro-food products after the European Union and the United States. Two-thirds of the total value of agricultural production are crop products, and one-third livestock products. The main product in Brazilian exports is soybeans (grain, meal, and oil), which represent almost 50% of the agro-food exports.

After the recession in 2015 and 2016, Brazilian GDP grew moderately at just below 2% between 2017 and 2019. The economy shrank by 4% in 2020 during the COVID-19 crisis but rebounded in 2021, and grew by 5%. At the same time, inflation has increased above 8% and unemployment reached 14%.

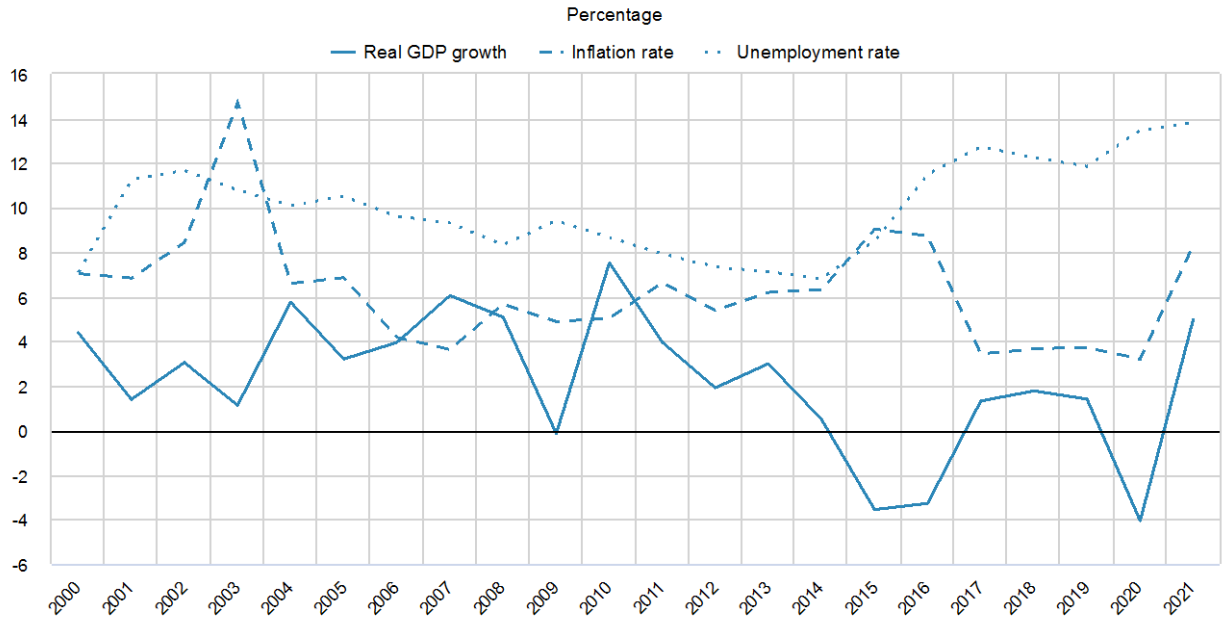
Agro-food exports in Brazil have exceeded USD 80 billion per year since 2017, generating an annual agro-food trade surplus of more than USD 76.5 billion in 2020. Around 53% of Brazilian agro-food exports are primary products for industry (including soybeans), and more than 61% of the country's imports are processed products.

Table 6.3. Brazil: Contextual indicators

	Brazil		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	1,584	3 154	4.0%	2.9%
Population (million)	175	213	4.1%	4.1%
Land area (thousand km²)	8 358	8 358	10.2%	10.1%
Agricultural area (AA) (thousand ha)	228 324	236 879	7.6%	8.1%
			All countries[1]	
Population density (inhabitants/km²)	21	25	53	63
GDP per capita (USD in PPPs)	9 061	14 836	9 281	20 929
Trade as % of GDP	9	13	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	5.5	5.9	2.9	4.9
Agriculture share in employment (%)	16.5	9.1	-	-
Agro-food exports (% of total exports)	23.4	41.7	6.2	8.5
Agro-food imports (% of total imports)	7.1	6.5	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	67	67	-	-
Livestock in total agricultural production (%)	33	33	-	-
Share of arable land in AA (%)	20	24	32	34

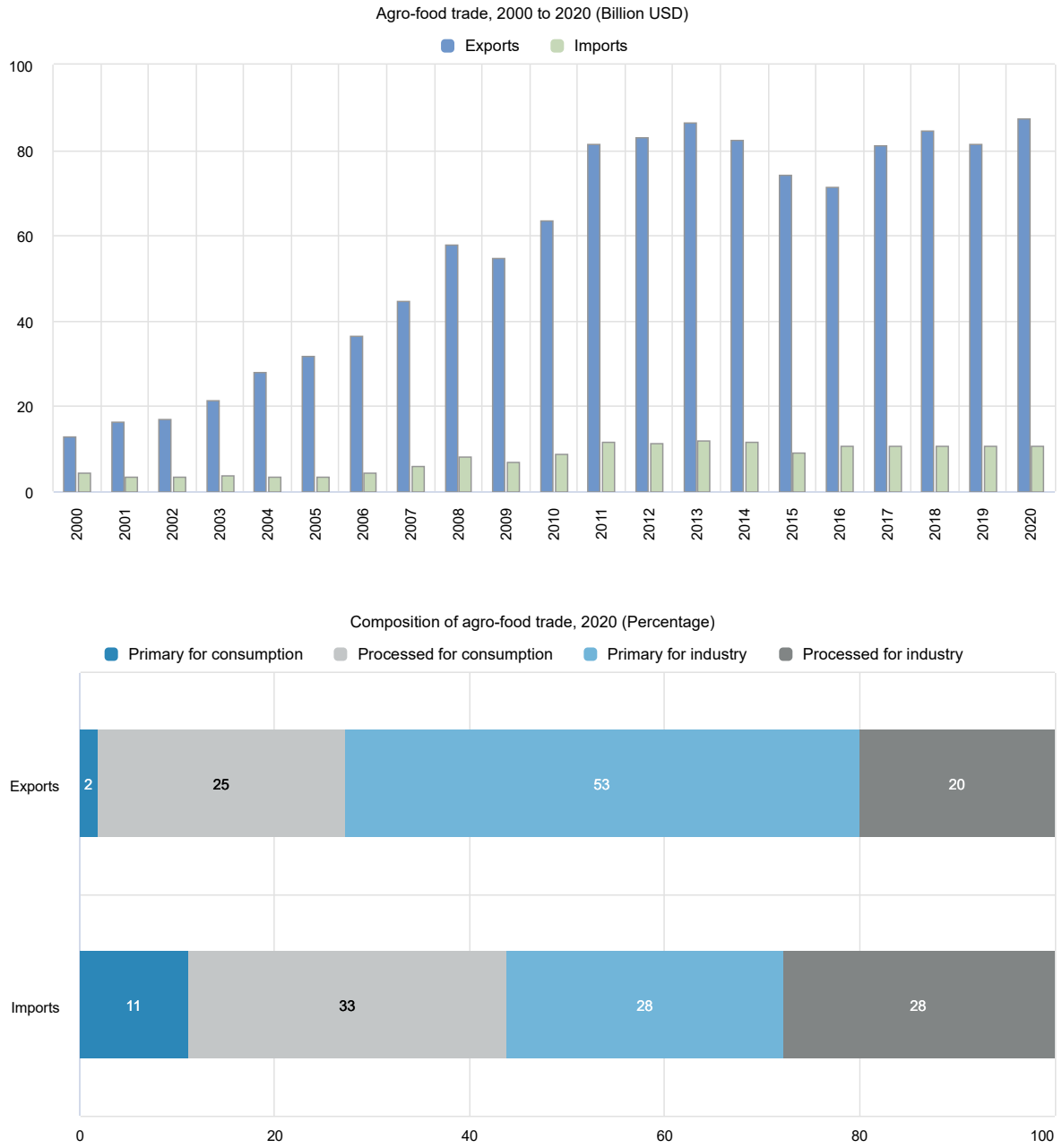
Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 6.5. Brazil: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 6.6. Brazil: Agro-food trade



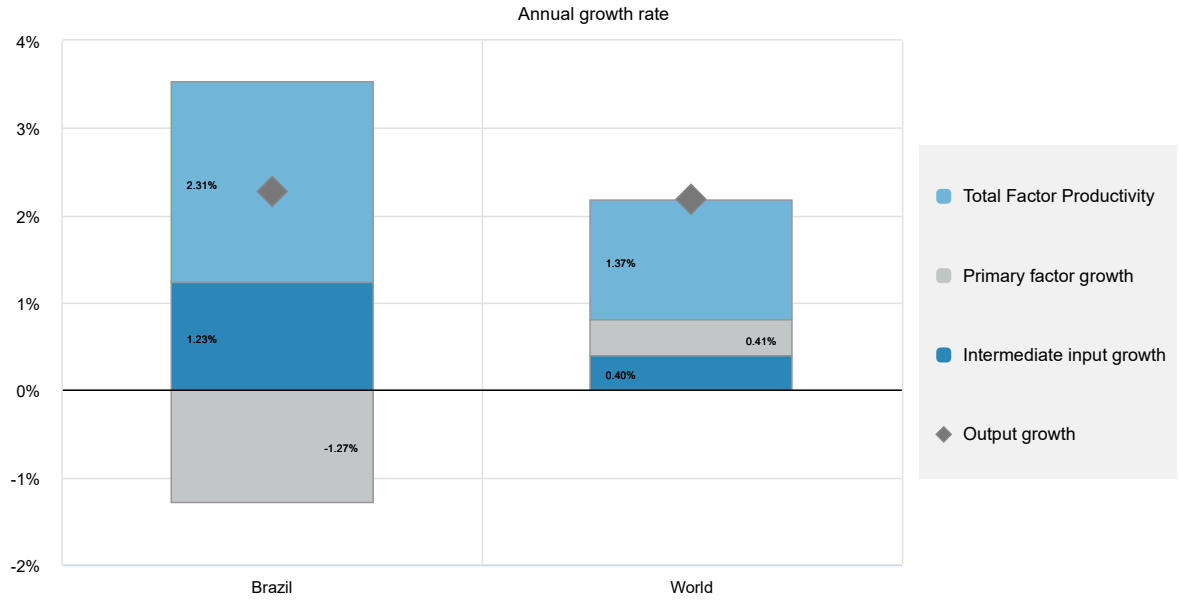
Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Between 2010 and 2019, Brazilian agricultural production increased at an annual rate of 2.3%, slightly above the world average. Increases in production were driven Total Factor Productivity (TFP) growth of 2.3% per year, well above the global average, while increased use of intermediary inputs was offset by the declining use of primary factors in agricultural production.

Agriculture accounted for 43.3% of GHG emissions in 2020, which is below the level observed in 2000, but still well above the OECD average. The use of energy by the agricultural sector has increased up to

5.6% of total use in 2020, also above the OECD average. The larger share of the agricultural sector in the Brazilian economy and the importance of pasture-based livestock contribute to these outcomes. Even though the agriculture's share of water abstractions remained high at 58.1%, water stress is low. Nutrient surpluses in Brazil have increased since 2000, and the phosphorous balance is more than five times the OECD average.

Figure 6.7. Brazil: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 6.4. Brazil: Productivity and environmental indicators

	Brazil		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	3.2%	2.3%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	20.8	21.3	32.1	30.0
Phosphorus balance, kg/ha	11.8	16.6	3.4	2.9
Agriculture share of total energy use (%)	4.8	5.6	1.7	2.0
Agriculture share of GHG emissions (%)	45.3	43.3	8.6	9.7
Share of irrigated land in AA (%)	1.3	2.4	-	-
Share of agriculture in water abstractions (%)	57.0	58.1	46.3	43.7
Water stress indicator	0.5	0.7	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

OECD (2015), *Innovation, Agricultural Productivity and Sustainability in Brazil*, OECD Food and Agricultural Reviews, OECD Publishing, Paris, https://doi.org/10.1787/9789264237056-en. [1]

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Note

[1] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Brazil%20First/Updated%20-%20First%20NDC%20-%20%20FINAL%20-%20PDF.pdf

7 Canada

Support to agriculture

Canada has significantly reduced support to agriculture since the late 1980s. Producer support as a share of gross farm receipts was halved from 1986-88 to 2000-02, largely because market price support (MPS) to the grains industry was discontinued in 1995. Producer support was halved again by the early 2010s and averaged about 10% of gross farm receipts in 2019-21 – a little over half of the OECD average.

Despite past reductions, MPS continues to dominate support to producers (albeit limited to the dairy, poultry and egg sectors, which remain under supply management), with custom tariffs, production quotas and price-setting elevating domestic prices above world prices. Milk receives high single commodity transfers, at 37% of its gross farm receipts value. Prices received by farmers in 2019-21 were 5% higher on average than world markets, while prices for commodities not under supply management aligned with world levels. Payments based on unconstrained use of variable inputs, notably fuel, are also potentially most-distorting. Together with MPS, these represented 55% of aggregated gross producer transfers in 2019-21, or 5% of gross farm receipts. Other budgetary support to individual producers focused on risk management. Due to severe weather conditions, risk management tools played a more important role in 2021, with payments for crop insurance increasing by nearly CAD 2.9 billion (USD 2.3 billion) compared to the previous year.

Support to general services (GSSE) declined relative to the size of the sector, indicating that rising expenditures have not kept pace with the sector's growth. These amounted to 3% of the agricultural production value during 2019-21, down from 6% at the beginning of the century and slightly below the OECD average. In terms of composition, the top two priorities for Canada are consistently expenditures on agricultural knowledge and innovation, and inspection and control systems, each accounting for about 40% of GSSE expenditures in recent years. However, while agricultural knowledge and innovation held a relatively stable share of the GSSE since the late 1980s, the share of expenditure devoted to inspection and control systems increased by 17 percentage points over the same period.

Overall, the cost of total support to the agricultural sector fell. The total support estimate represented 0.4% of Canada's GDP in 2019-21, down from 1.6% in 1986-88 and 0.7% in 2000-02, well below the OECD average. Of total support, three quarters went to individual farmers in the past three years, and almost all the remainder went to general services.

Recent policy changes

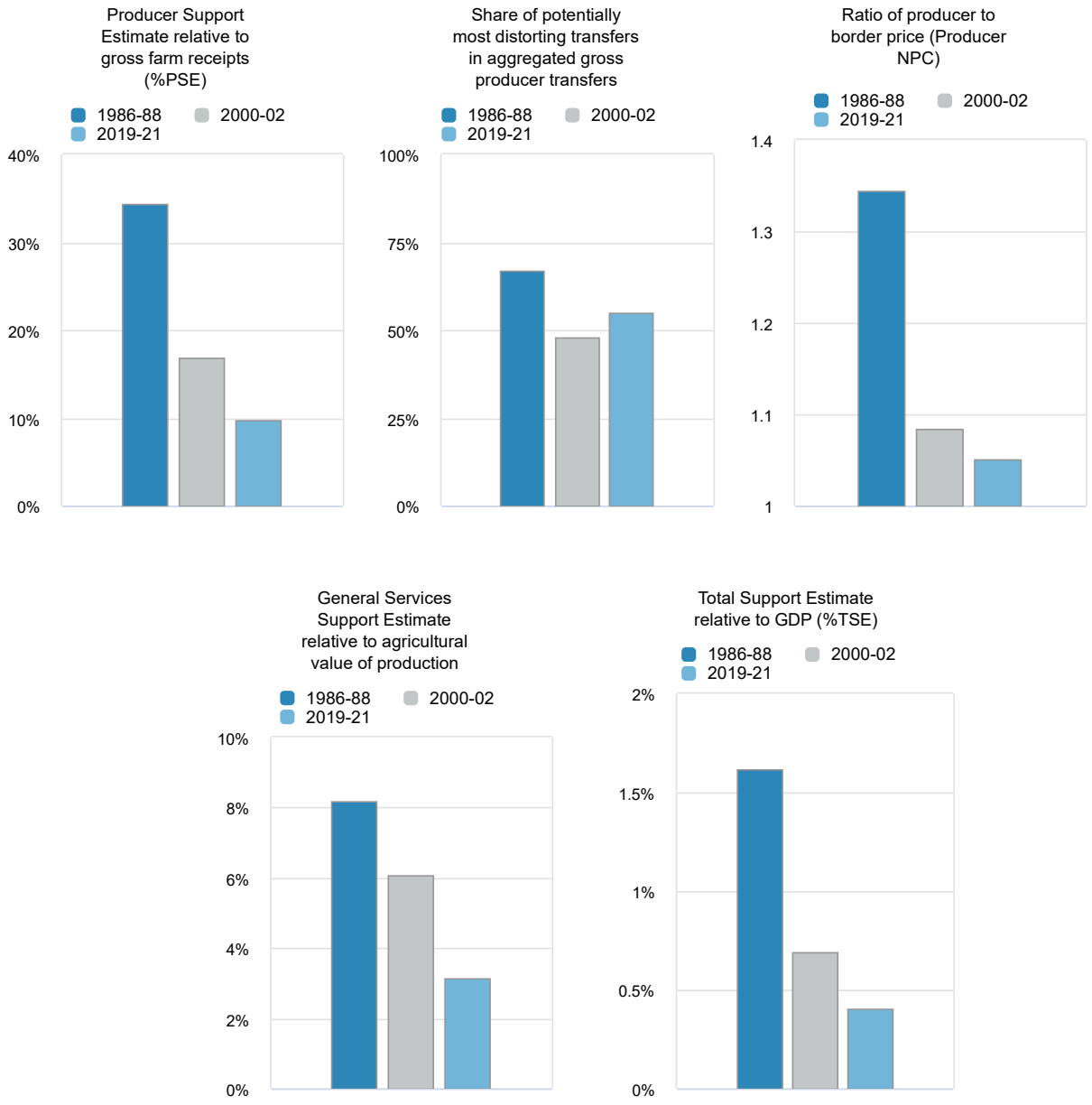
Federal, provincial and territorial Ministers of Agriculture jointly issued the Guelph Statement on 10 November 2021. The statement sets out the direction for the future of the sector and for the next Canadian agricultural policy framework, due in April 2023. The sustainable agriculture approach was announced, with priorities including tackling climate change and environmental protection; science, research and innovation; creating the conditions for Canadian businesses to meet evolving challenges; building sector capacity and growth; and enhancing resiliency to anticipate, mitigate and respond to risks.

Recent policy interventions in Canada focus on alleviating financial pressure on livestock farmers who faced extraordinary additional costs due to drought and wildfires. Record high temperatures and the lack of rainfall in 2021 affected agricultural production in western Canada. The federal government made CAD 100 million (USD 80 million) available through the AgriRecovery Framework to address immediate needs. A raft of measures was introduced at the provincial level with the same purpose.

Assessment and recommendations

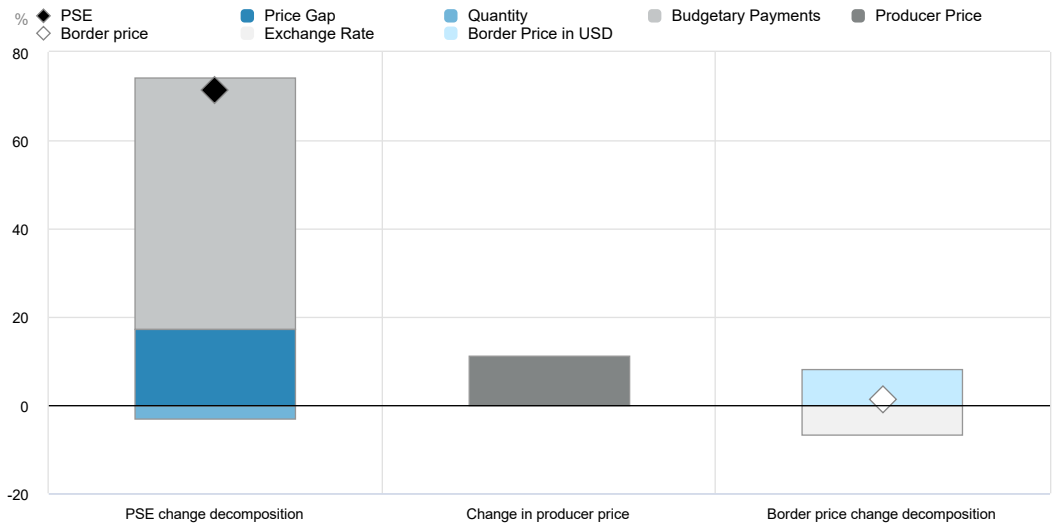
- Agriculture's share of Canada's greenhouse gas (GHG) emissions (8%) remains below the OECD average, and agriculture's absolute emission levels remained largely stable over the last 15 years. Ambitious, economy-wide GHG emission reduction targets do not specifically cover the agricultural sector, which may result in the sector lagging. The national fertiliser emission reduction target is a step towards curbing nitrous oxide (N_2O) emissions, which, contrary to methane (CH_4) emissions, increased over the past 15 years.
- Canada has one of the most stringent carbon pricing systems in the world. However, the agricultural sector remains largely excluded, with non-energy-related agricultural emissions not covered by the system, and with exceptions and rebates provided for gasoline and diesel fuel used by farms. The carbon pricing system thus provides weak incentives to reduce a small fraction of emissions from agriculture. Specific targets for agriculture and land use emissions, based on their marginal costs, are recommended to support the economy-wide GHG mitigation efforts. Additionally, wider use of agricultural carbon offset schemes could contribute to practices that reduce GHG emissions and increase carbon storage in soil.
- The *Healthy Environment and a Healthy Economy* plan is a step towards reducing negative environmental externalities from agriculture and boosting the sector's sustainability through the development and adaptation of clean technologies and processes. However, clear and specific targets, monitoring and impact assessment will be crucial to achieve the policy's ambitions.
- The Canadian Agricultural Partnership Framework Agreement for 2018-23 continues to emphasise general services support to the sector through programmes that target industry-led research and development, adoption of innovation, and inspection and control systems. The next policy framework should reinforce this focus to strengthen the sector's long-term competitiveness and sustainability.
- The 2018-23 agricultural policy framework provides farmers with an array of risk management tools. The Canadian approach to risk management evolved over time to reduce reliance on ad hoc policy responses and shift towards a more proactive policy framework. Nonetheless, holistic evaluation of the risk management policy toolkit and additional resilience-building programmes could enable larger-scale adoption of the most successful programmes, stimulate the development of market-based tools, and encourage farmers to find better ways to manage risks at farm level. Furthermore, the sector's long-term resilience could benefit from linkages and trade-offs between business risk management programmes and environmental outcomes (OECD, 2020[1]).
- Although producer support relative to gross farm receipts was below the OECD average in recent years, potentially most-distorting transfers remain the main component of transfers to producers – particularly market price support to the dairy sector. For most commodities, domestic market prices align with world prices, but the dairy, poultry and egg sectors continue to be protected from international competition via market price support measures that distort production and trade. To phase out supply management for these commodities, the quotas should increase and price support for the dairy, poultry and egg sectors should be reduced. This would encourage market responsiveness, stimulate innovation (to increase efficiency and diversify towards higher-value products), and reduce quota rents.

Figure 7.1. Canada: Development of support to agriculture



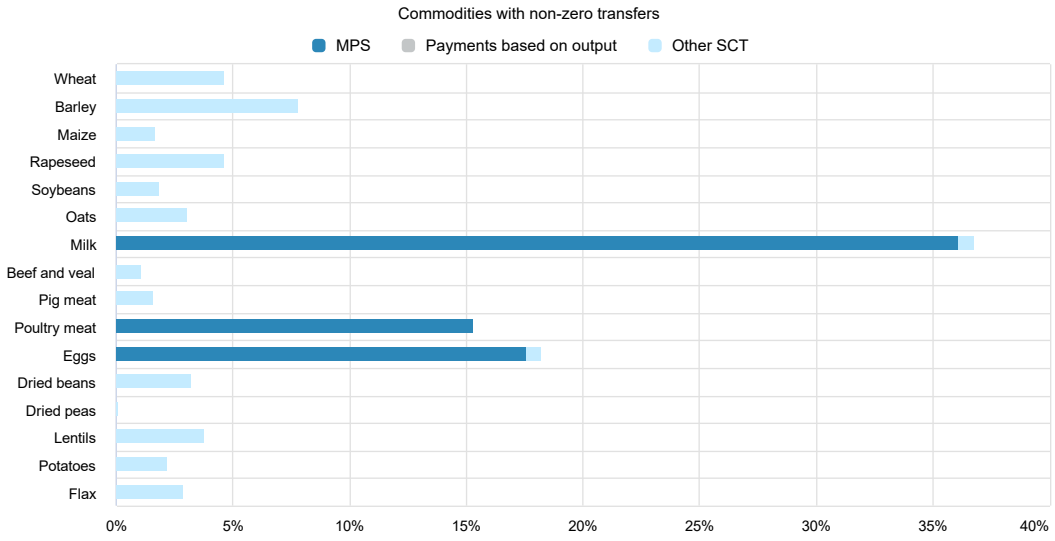
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 7.2. Canada: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 7.3. Canada: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 7.1. Canada: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**14 083**	**20 696**	**54 099**	**47 646**	**51 142**	**63 510**
***of which:** share of MPS commodities (%)*	85.57	81.97	81.80	80.62	81.13	83.66
Total value of consumption (at farm gate)	**11 833**	**15 015**	**33 893**	**30 932**	**32 098**	**38 650**
Producer Support Estimate (PSE)	**5 855**	**3 891**	**5 542**	**4 351**	**4 331**	**7 942**
Support based on commodity output	3 214	1 622	2 646	2 105	2 500	3 335
Market Price Support[1]	2 851	1 602	2 646	2 105	2 500	3 335
Positive Market Price Support	2 997	1 602	2 646	2 105	2 500	3 335
Negative Market Price Support	-146	0	0	0	0	0
Payments based on output	364	20	0	0	0	0
Payments based on input use	1 091	368	562	496	581	609
Based on variable input use	622	242	380	340	425	374
with input constraints	0	0	0	0	0	0
Based on fixed capital formation	448	108	174	147	142	232
with input constraints	0	0	0	0	0	0
Based on on-farm services	20	18	9	9	14	3
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	1 336	1 307	2 203	1 449	1 205	3 954
Based on Receipts / Income	467	586	525	544	409	620
Based on Area planted / Animal numbers	869	721	1 678	905	796	3 334
with input constraints	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	1	0	4	0
Payments based on non-current A/An/R/I, production not required	0	553	85	255	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	553	85	255	0	0
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	8	0	0	0	0	0
Based on long-term resource retirement	8	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	206	41	44	47	41	45
Percentage PSE (%)	**34.44**	**16.93**	**9.67**	**8.72**	**8.18**	**11.66**
Producer NPC (coeff.)	**1.34**	**1.08**	**1.05**	**1.05**	**1.05**	**1.06**
Producer NAC (coeff.)	**1.53**	**1.20**	**1.11**	**1.10**	**1.09**	**1.13**
General Services Support Estimate (GSSE)	**1 153**	**1 260**	**1 688**	**1 633**	**1 720**	**1 712**
Agricultural knowledge and innovation system	483	536	645	602	648	683
Inspection and control	283	348	700	724	745	632
Development and maintenance of infrastructure	268	182	167	135	168	199
Marketing and promotion	85	179	131	128	119	146
Cost of public stockholding	0	0	0	0	0	0
Miscellaneous	34	15	45	45	41	51
Percentage GSSE (% of TSE)	**16.30**	**24.47**	**23.19**	**27.21**	**27.73**	**17.51**
Consumer Support Estimate (CSE)	**-2 533**	**-1 712**	**-2 995**	**-2 480**	**-2 751**	**-3 753**
Transfers to producers from consumers	-2 766	-1 596	-2 645	-2 101	-2 500	-3 335
Other transfers from consumers	-31	-117	-447	-398	-401	-540
Transfers to consumers from taxpayers	31	0	97	19	150	122
Excess feed cost	234	0	0	0	0	0
Percentage CSE (%)	**-21.54**	**-11.39**	**-8.84**	**-8.02**	**-8.61**	**-9.74**
Consumer NPC (coeff.)	**1.31**	**1.13**	**1.10**	**1.09**	**1.10**	**1.11**
Consumer NAC (coeff.)	**1.27**	**1.13**	**1.10**	**1.09**	**1.09**	**1.11**
Total Support Estimate (TSE)	**7 039**	**5 151**	**7 327**	**6 004**	**6 201**	**9 776**
Transfers from consumers	2 798	1 713	3 092	2 500	2 901	3 875
Transfers from taxpayers	4 273	3 555	4 682	3 903	3 700	6 442
Budget revenues	-31	-117	-447	-398	-401	-540
Percentage TSE (% of GDP)	**1.62**	**0.69**	**0.41**	**0.34**	**0.38**	**0.49**
Total Budgetary Support Estimate (TBSE)	**4 188**	**3 549**	**4 681**	**3 899**	**3 700**	**6 442**
Percentage TBSE (% of GDP)	**0.96**	**0.47**	**0.26**	**0.22**	**0.22**	**0.33**
GDP deflator (1986-88=100)	**100**	**138**	**201**	**195**	**197**	**211**
Exchange rate (national currency per USD)	**1.32**	**1.53**	**1.31**	**1.33**	**1.34**	**1.25**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Canada are: wheat, maize, barley, oats, soybean, rapeseed, flax, potatoes, lentils, dried beans, dried peas, milk, beef and veal, pig meat, poultry and eggs.

Source: OECD (2021), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Prior to the mid-1980s, Canada **heavily supported the agricultural sector** through measures such as import tariffs, export and production subsidies, and price and production controls. The dominant features of agricultural policy were supply management measures in the dairy and poultry sectors, collective marketing in grains and oilseeds (notably by the Canadian Wheat Board, or CWB), and income stabilisation programmes (Barichello, 1995[2]). Support varied between eastern and western provinces, largely due to Canada's decentralised political system, and the independence of provincial governments in policies such as marketing legislation (Anderson, 2009[3]).

In the mid-1980s, Canada began agricultural policy reform, particularly in the grain sector. In 1990, the Western Grains Stabilization Program, which was intended to stabilise net margins for major grains and oilseeds from western Canada, was terminated (Anderson, 2009[3]). This was replaced by the National Tripartite Stabilization Program (NTSP), which established federal-provincial cost-sharing of programmes (Antón, Kimura and Martini, 2011[4]). The Farm Income Protection Act of 1991 changed Canada's approach to supporting producers by moving from policies aimed at particular commodities towards programmes supporting farm incomes. This established two safety-net programmes: (1) the Gross Revenue Insurance Plan (GRIP, 1991-1996/2002) to protect against reductions in revenues and yields; and (2) the Net Income Stabilization Account (NISA, 1991-2009) to subsidise savings accounts for individual producers (Anderson, 2009[3]; Klein and Storey, 1998[5]). Furthermore, compliance with the General Agreement on Tariffs and Trade (GATT) and free trade agreements of the early 1990s (NAFTA) accelerated the reform process, eliminating most commodity-based policies (e.g. NTSP) except those targeting supply-managed commodities (Antón, Kimura and Martini, 2011[4]). In 1995, transport subsidies to grains (the Western Grain Transport Assistance and the Feed Freight Assistance) were abolished (Anderson, 2009[3]), ending the period of high market price support[1] to these commodities (Figure 7.4).

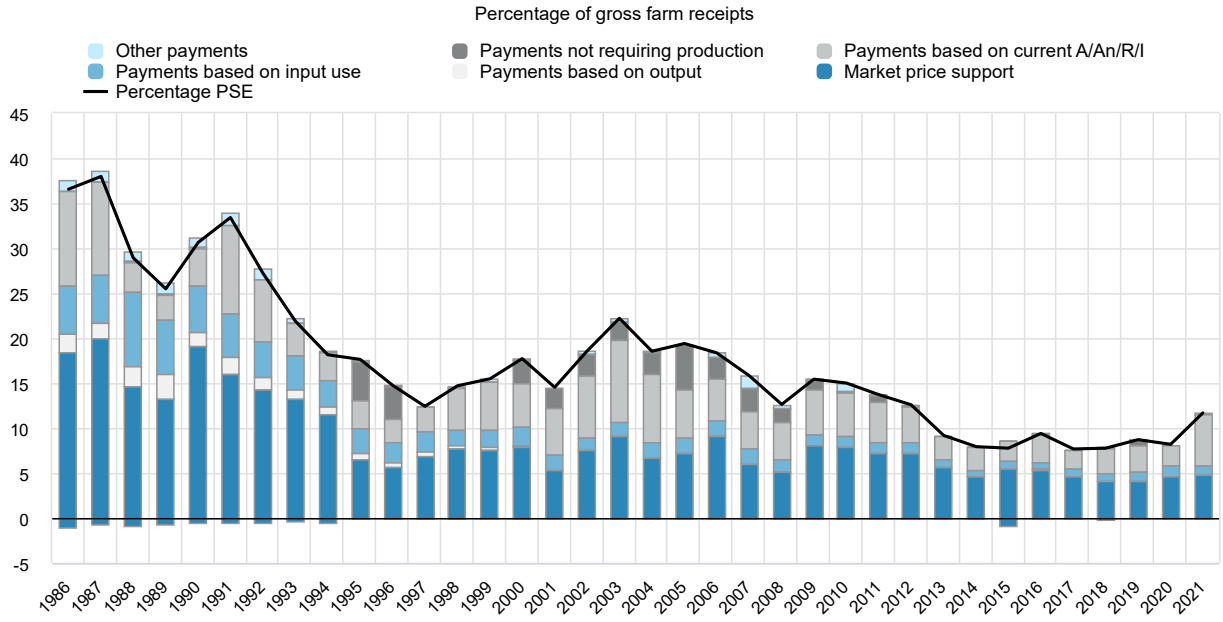
The Agricultural Income Disaster Assistance (AIDA) programme introduced in 1998 was the first to comply with criteria for **income insurance and safety-net programmes** under the World Trade Organization Agreement on Agriculture. AIDA was established to serve as a core income stabilisation policy, reducing the need for ad hoc programmes. The "disaster" component was integrated into subsequent programmes: the Canadian Farm Income Program (CFIP, 2001-03); the Canadian Agricultural Income Stabilization (CAIS, 2004-08); and AgriStability (Anderson, 2009[3]; Statistics Canada, 2021[6]; Antón, Kimura and Martini, 2011[4]). Since 2003, agricultural policy objectives and approaches are set out in longer-term **Agricultural Policy Frameworks** developed through co-operation by federal, provincial and territorial (FPT) governments. The first Framework covered five areas: (1) business risk management, (2) food safety and quality, (3) environment, (4) science and innovation, and (5) renewal (skills and training) (Agriculture and Agri-Food Canada, 2005[7]). Initially, the federal government delivered programmes directly. This evolved with the Growing Forward framework (2008-13) which transferred programme implementation to the provinces and territories, allowing for more flexibility and better adaptability to local needs (OECD, 2015[8]). During this time, the AgriStability and AgriInvest programmes replaced CAIS and NISA, respectively, continuing to provide farmers with income stabilisation products and subsidised saving accounts. The Growing Forward 2 framework (2013-18) strengthened the role of these programmes and incorporated additional initiatives, such as AgriInsurance (previously referred to as the Crop Insurance) and the AgriRecovery disaster programme framework (Anderson, 2009[3]; Statistics Canada, 2021[6]; Antón, Kimura and Martini, 2011[4]). Risk management programmes continue under the current Canadian Agricultural Partnership (2018-23) (see next section).

Table 7.2. Canada: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1985	Import barriers for competing imported products and support for traded products Domestic market control	Agricultural tariffs for competing imported products Import quotas/tariff-rate quotas Export subsidies for agricultural products Transportation subsidies for agricultural products Supply management for dairy and poultry products Grains policy featured by a one-desk selling marketing board and significant transportation subsidy Price controls for agricultural products using marketing boards such as the collective marketing of wheat and barley (CWB)
1985-2000	Gradual reforms and trade liberalisation Increasing emphasis on income and revenue support	Reduction of agricultural tariffs and quotas Diminishing reliance on marketing boards, supply management, price controls GATT, free trade agreements Dismantling of Western Grains Stabilization Program Termination of Western Grains Transportation Assistance and Feed Freight Assistance Gradual dismantling of payments coupled to production Introduction of "whole farm" income stabilisation programmes Introduction of insurance subsidies
2000-present	Income stabilisation emphasis implemented through federal, provincial and territorial (FPT) co-operation	Continued supply management of the dairy, poultry and eggs sectors: price-setting mechanisms and tariffs Privatisation of the CWB Agricultural policy frameworks developed through the cooperation of FPT governments Subsidies for farm income stabilisation Subsidies for farm savings Insurance subsidies

Support to agricultural producers in Canada decreased over the last three decades, with government support declining from over 35% of farmers' revenues in the mid-1980s to around 10% in recent years (Figure 7.4). This resulted from the discontinuation of market price support to grains and oilseeds in the mid-1990s, and the reduction or phase-out of several programmes offering payments based on output (e.g. support to dairy farmers under the Agriculture Stabilization Act) and input use (e.g. Federal Fuel Tax Rebates) between the late 1980s and the early 2000s. Market price support to supply-managed commodities, particularly to the dairy sector, remains the largest share of transfers to producers. Payments based on current production, including multiple risk management programmes (e.g. AgriInsurance), are the second largest contributor. The share of such support is particularly high in the years when producer costs are higher or profitability reduced due to difficult weather conditions such as drought and wildfires in 2021. Other categories of payments play a relatively minor role in Canadian farm revenues.

Figure 7.4. Canada: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Canada's agricultural support policies differentiate between supply-managed sectors (dairy, poultry and eggs) which are protected and oriented towards the domestic market, and the remaining commodity sectors, which operate in an open market and export-orientated environment.

A **supply management system** provides market price support to the dairy, poultry and eggs sectors through customs tariffs (import control) and production quotas (production control), tradable within provinces, combined with domestic price-setting according to production costs (pricing mechanism). Successive agriculture policy frameworks regard this system as a risk management instrument (Parliament of Canada, 2017[9]; Parliament of Canada, 2012[10]).

The **Canadian Agricultural Partnership (CAP) 2018-23**, multilateral policy framework, outlines general policies and programmes established to support Canada's agriculture and agro-food[2] sector (Agriculture and Agri-Food Canada, 2018[11]). Agriculture is a shared jurisdiction, and all levels of government (FPT: federal, provincial and territorial) work closely in the development of agriculture policy frameworks and the delivery of programmes across the country. The principle of shared responsibility provides provinces and territories flexibility to design and deliver programmes that respond to regional needs while remaining aligned with national priorities. Provinces and territories can also develop and fund agriculture programmes outside of this framework.

The current policy framework comprises a suite of **business risk management (BRM) programmes** to help farmers manage market volatility and disaster risks, and **strategic initiatives** to increase competitiveness, productivity and profitability in the sector, increase its environmental sustainability,

expand domestic and international markets, and improve the anticipation and mitigation of and response to risks.

The **BRM programmes** support producers in managing risks that threaten the viability of their farm or are beyond their capacity to control, and build on the backbone of programmes delivered during the previous frameworks. It also attempts to balance *ex ante* and *ex post* measures while limiting *ad hoc* forms of assistance. Under the CAP 2018-23, FPT governments jointly provide approximately CAD 1.5 billion (USD 1.1 billion) per year to finance five BRM programmes:

- *AgriStability*, an income stabilisation programme to support producers in years of significant whole-farm margin declines.
- *AgriInvest*, a savings tool matching contributions to producers who make annual deposits to an AgriInvest account, to help them manage moderate income declines, make investments in farming operations to mitigate risk or improve market income.
- *AgriInsurance*, a cost-shared insurance programme to reduce the financial impact of production or asset losses due to natural hazards.
- *AgriRecovery*, a disaster relief framework to help producers with the cost of activities necessary to recover from natural disasters.
- *AgriRisk,* a programme to support the development of new risk management tools by the private sector.

Strategic initiatives aim to foster the long-term prosperity of Canada's agriculture and agro-food sector under the CAP 2018-23 by providing an investment of CAD 3 billion (USD 2.3 billion), including CAD 1 billion (USD 0.8 billion) in federal programmes and activities and CAD 2 billion (USD 1.5 billion) in cost-shared programmes and activities.

Federally funded strategic initiatives comprise large, national programmes to support the sector in areas of federal jurisdiction and focus on three pillars:

- *Growing trade and expanding markets* through the *AgriMarketing* programme, which supports industry-led market development activities by helping the sector identify and seize domestic and international opportunities; and the *AgriCompetitiveness* programme, which helps the sector adapt to changing commercial and regulatory environments, share best practices, and provide mentorship opportunities.
- *Fostering innovative and sustainable growth in the sector* through the *AgriScience* programme, which supports innovation driven by industry research priorities, including pre-commercialisation activities and investments in cutting-edge research to benefit the agriculture and agro-food sector; and the *AgriInnovate* programme, which supports projects that accelerate the demonstration, commercialisation or adoption of innovative products, technologies, processes or services that increase the sector's competitiveness and sustainability.
- *Supporting diversity and a dynamic, evolving sector* through the *AgriAssurance* programme, which aims to foster public trust by helping industry develop and adopt systems, standards and tools to measure food safety and traceability; and the *AgriDiversity* programme, which aims to increase the capacity of youth, women, Indigenous Peoples and persons with disabilities to better participate in the agricultural sector. It supports skills, leadership, and entrepreneurial development; and facilitates knowledge sharing and best management practices.

Cost-shared strategic initiatives are funded 60% by the federal government and 40% by the provincial/territorial governments, and delivered by the latter to ensure that programmes meet their needs. These initiatives focus on six priority areas:

- *Science, research and innovation* to help farmers, food processors and agro-businesses adopt innovative products and practices in order to improve resiliency and productivity through research, innovation and knowledge transfer.
- *Markets and trade* to facilitate the maintenance and expansion of domestic and international markets, and help farmers and food processors improve their competitiveness through skills development and improved export capacity, underpinned by a strong and efficient regulatory system.
- *Value-added agriculture and agro-food processing* to foster continued growth by supporting targeted actions aiming to increase productivity and competitiveness.
- *Public trust* to build a firm foundation for the sector through improved assurance systems in food safety and plant and animal health, stronger traceability and effective regulation.
- *Risk management* to enable proactive and effective risk mitigation and adaptation, and strengthen the resilience of the sector by ensuring comprehensive, responsive and accessible programmes.
- *Environmental sustainability and climate change* to build the sector's capacity to protect natural resources, mitigate agricultural GHG emissions and adapt to the anticipated impacts of climate change by enhancing sustainable growth.

Provincial/territorial governments design and administer most farm-level environmental programmes. For instance, the *Environmental Farm Plans* (EFP) programmes and the *Environmental Stewardship Incentive* programmes, financed jointly by FPT governments, strive to advance environmentally sustainable agriculture. The EFP consists of an assessment of on-farm environmental risks and the development of an action plan to mitigate them. The Environmental Stewardship Incentive programmes provide financial assistance to farms with an EFP to adopt specific beneficial practices, such as nutrient management, manure storage and soil erosion controls (OECD, 2015[8]). They are implemented on the basis of specific regional partnership programmes, such as the 2018 Canada-Ontario Lake Erie action plan to reduce phosphorus pollution (Gruère and Le Boëdec, 2019[12]). The government of Quebec has its own agri-environmental programme, the *Prime-Vert* (2018-23), and consulting services that aim to increase and facilitate the adoption of agri-environmental practices by agricultural producers. The government of Manitoba provides the *Ag Action Manitoba* programme offering activities for farmers that support the growth and sustainability of primary agriculture. Its pilot programme, *Assurance: Agricultural Crown Lands Forage Productivity* (2021), supports pasture improvement by funding grazing management plan development, infrastructure expansion (cross-fencing, wells, dugouts) and rejuvenation of forage lands (perennial forage seed, seeding and brush management) (Government of Manitoba, n.d.[13]).

The first **Food Policy for Canada** (2019) aims to create a co-ordinated and food-systems-based approach to taking action on food-related opportunities and challenges. The Food Policy indicates four areas for short-term actions, including: (1) helping Canadian communities access healthy food; (2) making Canadian food the top choice at home and abroad; (3) supporting food security in northern and indigenous communities; and (4) reducing food waste.

Climate change mitigation policies in agriculture

The agricultural sector accounted for 59 $MtCO_2eq$ in 2019, equal to 8.1% of Canada's total GHG emissions.[3] Forty-eight per cent of agricultural emissions were in the form of nitrous oxide (N_2O), primarily from nitrogen fertiliser use, while 47% were methane (CH_4), mainly from cattle production, and the remainder was carbon dioxide (C_2O) from lime and urea application.

In its 2021 updated Nationally Determined Contribution (NDC) to the Paris Agreement, Canada committed to reducing national net GHG emissions 40-45% below 2005 levels by 2030 and committed to achieving net-zero emissions by 2050, an increase in ambition from previous targets. Both targets are economy-wide and include agriculture and other land use sectors, however without providing agriculture-specific targets

(Government of Canada, 2021[14]). Canada also signed the Global Methane Pledge and committed to reducing its economy-wide methane emissions by 2030 (Environment and Climate Change Canada, 2021[15]). A national target was set for emissions from fertilisers to be reduced 30% below 2020 levels by 2030 (Government of Canada, 2021[14]). The government also proposed to work with fertiliser manufacturers, farmers, provinces and territories to develop an approach to meet the target.

The commitments were enshrined in the *Canadian Net-Zero Emissions Accountability Act*, which received Royal Assent on 29 June 2021. The act aims to ensure transparency and accountability by requiring the establishment of national emissions reduction targets for 2035, 2040 and 2045 ten years in advance; the development of a science-based emission-reduction plan for each target; and monitoring of progress on implementation and effectiveness (Government of Canada, 2022[16]).

The *Pan-Canadian Framework (PCF) on Clean Growth and Climate Change* established in 2016 is Canada's first national climate change plan to reduce GHG emissions, accelerate clean economic growth and build resilience to a changing climate. The PCF was developed jointly by federal, provincial and territorial (FPT) governments and outlines a strategy for emission reductions across all sectors of the economy, including the agriculture, forestry and other land use (AFOLU) sector (Canada, 2016[17]). Building on the PCF, the government of Canada created its *A Healthy Environment and a Healthy Economy* plan, which contains new and strengthened federal policies, programmes and investments to cut pollution and build a stronger and cleaner economy, including initiatives supporting climate-smart agriculture[4] in Canada (Environment and Climate Change Canada, 2020[18]). The plan was released on 11 December 2020, with more details on the initiatives announced in 2021.

The provincial governments set their own climate goals and key actions. For instance, Quebec's *2020-2030 Sustainable Agriculture Plan (Plan d'agriculture durable 2020-2030)*, with a budget of CAD 125 million (USD 93 million) spread over the first five years, aims to accelerate the adoption of efficient agri-environmental practices by 2030 (Government of Quebec, 2020[19]). New Brunswick's 2016 climate change action plan, *Transitioning to a Low-Carbon Economy*, proposes to reduce emissions from agriculture by promoting beneficial farm management practices that mitigate GHGs and increase on-farm adaptation solutions, and encourage agricultural carbon sinks (Government of New Brunswick, 2016[20]).

Carbon pollution pricing is considered Canada's main instrument to achieve GHG reductions. However, the agricultural sector remains largely excluded, with non-energy-related agricultural emission not covered by the system, and exceptions and rebates provided for gasoline and diesel fuel used by farms. Carbon pollution pricing was developed under the PCF and is in place in every jurisdiction since 2019. Canada's approach offers flexibility as provinces and territories can design pricing systems tailored to their needs, provided they meet the federal minimum stringency standard. Sub-national systems include a cap-and-trade system for GHG emissions in Quebec and a carbon tax in British Columbia. The federal backstop carbon pollution pricing system comprises two parts: a regulatory charge on fossil fuels such as gasoline and natural gas (known as the fuel charge), and a performance-based system for industries (known as the output-based pricing system). It applies to any jurisdiction that requests it or does not meet the federal benchmark. By early 2022, these include Manitoba, Nunavut and Yukon (in full), and Alberta, Ontario, Saskatchewan and Prince Edward Island (in part) (Government of Canada, 2022[21]).

Canada's carbon tax system is expected to become more stringent over the next decade, while retaining reliefs for the agricultural sector, thus reducing its incentives to contain emissions. The federal fuel charge works by taxing the sale of fossil fuels based on their carbon content. The federal carbon tax will reach CAD 50 (USD 40) per tonne of CO_2eq in 2022 and continue to increase by CAD 15 (USD 12) per year until it reaches CAD 170 (USD 136) per tonne in 2030 (Government of Canada, 2021[22]). All direct proceeds are returned to Canadians and their communities with approximately 90% going to citizens through the Climate Action Incentive Payment.[5] The federal carbon pollution pricing system is designed to provide targeted fossil fuel relief to limit the impact on the country's agricultural sector (Government of Canada, 2019[23]). In its 2021 Fall Economic and Fiscal Update, the federal government proposed to return fuel

charge proceeds directly to farming businesses in backstop jurisdictions via a refundable tax credit, starting with the 2021-22 fuel charge year (Government of Canda, 2021[24]). Payments to producers would be based on eligible expenses on gasoline or light fuel oil (diesel fuel) used in their operations. The government estimated that CAD 100 million (USD 80 million) would be available as rebates in the first year, and CAD 121 million (USD 97 million) the following year. There are also reliefs granted at the provincial level. For instance, under the *Greenhouse Carbon Tax Relief Grant Program* in 2021, British Columbia reimbursed up to 80% of the carbon tax to commercial vegetable, floriculture, and wholesale nursery and forest seedling operations (Government of British Columbia, 2021[25]).

Carbon pricing is complemented by the *Clean Fuel Standard* (CFS), a new regulation published by the government of Canada on 18 December 2020. The proposed regulations would reduce the lifecycle carbon intensity[6] of liquid fossil fuels used in Canada and support the domestic production of cleaner fuels, such as lower-carbon-intensity biofuels. A credit market would be established with each credit representing a lifecycle emission reduction of one tonne of CO_2eq. The CFS regulations would contribute to the goal of reducing GHG emissions by more than 20 MtCO_2eq per year by 2030. They would also create economic opportunities for voluntary parties like biofuel and other lower-carbon fuel producers to create and sell their credits, which in turn would generate favourable conditions for feedstock providers, such as farmers, supporting lower-carbon fuel production. The final version of the regulations is expected in spring 2022, with the CFS reduction requirements coming into force on 1 December 2022 (Government of Canada, 2022[26]; Government of Canada, 2020[27]).

Within the frame of *A Healthy Environment and a Healthy Economy* plan, the government of Canada is undertaking both agriculture-specific and economy-wide actions that benefit the agricultural sector (Environment and Climate Change Canada, 2020[18]). Among the policy tools:

- The *Agricultural Clean Technology (ACT)* initiative supports farmers and agro-food businesses in developing and adopting clean technologies to reduce GHG emissions. This programme provides CAD 165.7 million (USD 132.2 million) over seven years through two funding streams. The first, the *Research and Innovation Stream* (2021 to 2028), aims to support the agricultural sector in developing transformative clean technologies and enabling the expansion of current technologies in three areas: green energy and energy efficiency; precision agriculture; and bioeconomy. The support is directed to pre-market innovation, including research, development, demonstration, and commercialisation activities. The second, the *Adoption Stream* (2021 to 2026), aims to help farmers adopt commercially available clean technologies and processes, with priority for those that show evidence of reducing GHG emissions and generating other environmental benefits. This funding stream is to support the purchase of more efficient grain dryers and fuel switching initiatives, in particular powering farms with clean energy and moving off diesel.
- The *Agricultural Climate Solutions (ACS)* initiative supports the development and implementation of farming practices to tackle climate change (Government of Canada, 2021[28]). It is a multi-stream programme under the *Natural Climate Solution Fund.*[7] The *Living Labs* stream, with CAD 185 million (USD 148 million) over ten years, aims to develop regional collaboration hubs, which will bring together farmers, scientists and other sector partners to develop, test and monitor beneficial management practices on farms that sequester carbon and mitigate GHG emissions to reduce Canada's environmental footprint and enhance climate resiliency. In addition, the *On-Farm Climate Action Fund* (2021-2024) worth CAD 200 million (USD 160 million) helps farmers adopt such practices, including nitrogen management, cover cropping and rotational grazing.
- The *Natural Climate Solutions Fund* invests in programmes that do not specifically target agriculture (Government of Canada, 2021[29]). It makes over CAD 3 billion (USD 2 billion) available over ten years to plant two billion trees. In addition, it will provide CAD 60 million (USD 48 million) over the next two years to protect existing wetlands and trees on farms, as announced in the Budget 2021. Through the *Nature Smart Climate Solutions Fund*, it also provides CAD 631 million

(USD 470 million) for projects that help conserve, restore and enhance wetlands, peatlands and grasslands to store and capture carbon.

- The *Low-carbon and Zero-emissions Fuels Fund*, a CAD 1.5 billion (USD 1.1 billion) investment, aims to increase the production and use of low-carbon fuels. Although this initiative is not specific to agricultural sector, it is to help farmers diversify by producing feedstocks for biofuels.

Provincial governments also use investment projects. For instance, the government of Nova Scotia announced the *Agriculture Clean Technology Program* in March 2021. This is an investment of CAD 5 million (USD 4 million) over two years to help farmers and food processors improve their operations, including adopting clean technologies that help reduce GHG emissions, improving energy efficiency, promoting sustainable and clean growth, increasing value-added agricultural production, extending growing seasons, and improving costs of production (Government of Nova Scotia, 2021[30]). The government of Prince Edward Island (PEI) launched the *PEI Agriculture Climate Solutions Program* in March 2021 to encourage and assist the PEI agricultural sector to implement best-management practices that mitigate the production of greenhouse gases from various in-field or on-farm activities or by stimulating carbon storage in soils (Government of Prince Edward Island, 2021[31]). In October 2021, the government of Quebec announced the *Quebec Sustainable Agriculture Research Network*, a flagship measure of the 2020-2030 Sustainable Agriculture Plan. The network aims to promote the development of knowledge for improved health and conservation of agricultural soils, and to reduce the use of pesticides and their associated risks in the context of climate change. It also aims to increase research potential by providing training in the field of sustainable agriculture (Government of Quebec, 2021[32]).

Domestic policy developments in 2021-22

On 10 November 2021, FPT Ministers of Agriculture issued the *Guelph Statement* setting out the direction for the future of the sector and, in particular, for the next **Canadian agricultural policy framework**, due to be launched in April 2023. The Statement presents the vision of further improving the sustainability of the agro-food sector through investment in tackling climate change and environmental protection; science, research and innovation; creating the conditions for Canadian businesses to meet evolving challenges; building sector capacity and growth; and enhancing resiliency to anticipate, mitigate and respond to risks.

Risk management was an important issue in 2021, as record high temperatures and the lack of rainfall affected agricultural production in western Canada. In August 2021, the federal government made available CAD 100 million (USD 80 million) through the *AgriRecovery Framework* to address the immediate extraordinary costs faced by producers due to drought and wildfires. This funding is designed to match all provincial *AgriRecovery* submissions on a 60-40 cost-shared basis between the federal and the provincial/territorial governments. A raft of measures were introduced at the provincial level. These include:

- The Alberta government announced, on 6 August 2021, an AgriRecovery response, the *2021 Canada-Alberta Livestock Feed Assistance Initiative*, to help address the extraordinary extra feed costs incurred by Alberta's livestock producers because of reduced grazing capacity.
- The British Columbia government, in collaboration with the government of Canada, enabled an *AgriStability "Late Participation" Option* to allow producers to register for the 2021 programme year until 31 December 2022. However, late registrants will receive a 20% lower payment rate than those who proactively enrolled. The *2021 Canada – British Columbia Wildfire and Drought Recovery Initiative* was launched to help agricultural producers deal with extraordinary costs associated with the 2021 wildfires. In addition, the *Emergency Management British Columbia (EMBC) Wildfire 2021 Emergency Feed Program* provided emergency feed support for up to 14 days to commercial livestock businesses to help them respond to the threats and impacts of wildfire and transition to revised operational strategies.

- The Manitoba Government launched the *Hay Disaster Benefit* in July 2021. This initiative provided an additional CAD 44 (USD 35) per tonne to insured forage producers to help offset the additional cost of replacement feed and transportation due to severe shortage of forage throughout the province. In August 2021, the *Canada-Manitoba AgriRecovery Drought Assistance* was announced with three programmes totalling up to CAD 155 million (USD 124 million): (1) the *Livestock Feed and Transportation Drought Assistance* to help livestock producers purchase and test feed for livestock, including transporting purchased feed from distant locations; (2) the *Livestock Transportation Drought Assistance* to help livestock producers offset freight expenses associated with moving their breeding herd to an alternate feeding location due to shortages of feed; and (3) the *Herd Management Drought Assistance* to help producers to offset the cost of replacing breeding animals when culling is above normal due to shortage of winter feed.
- The Ontario Government provided up to CAD 2 million (USD 1.6 million) through the *Northwestern Livestock Emergency Assistance Initiative* to assist farmers in north-western Ontario with emergency measures for feed, water, and basic livestock needs. In September 2021, the federal and provincial governments announced up to CAD 12.5 million (USD 10 million) in financial support through the *Canada-Ontario Transported Feed AgriRecovery Initiative* to help cover extraordinary costs associated with sourcing feed or transporting livestock to feed due to drought conditions. The same month, the provincial government announced the *Northwestern Ontario Drought Assistance Initiative* to provide financial assistance for well drilling and pond construction projects.
- The Saskatchewan Government launched the *2021 Canada-Saskatchewan Drought Response Initiative* under the *AgriRecovery* Framework in September 2021. Up to CAD 297.5 million (USD 237 million) in direct supports to help cattle producers maintain breeding stock while facing extraordinary costs.

In March 2021, FPT Ministers of Agriculture agreed to fully remove the reference margin limit (RML)[8] to the *AgriStability* programme. This change could increase the overall amount the programme pays out to participants by approximately CAD 95 million (USD 76 million) nationally. Furthermore, it was agreed that private insurance payments will be excluded from calculating a participant's programme year margin. This change applies to private insurance payments from programmes where the premiums are fully producer-funded and compensates for losses related to price, revenue, productions or margins. Both modifications were retroactive to the 2020 programme year. In addition to changes at the national level, the government of Ontario announced, on 25 June 2021, an increase in the compensation rate from 70% to 80% on the provincial portion of the *AgriStability* payments.

In December 2021, the government of Canada announced CAD 28 million (USD 22 million) in funding to support Prince Edward Island potato growers, who have been affected by trade disruptions caused by the temporary suspension of export certificates for fresh potatoes from Prince Edward Island to the United States.[9] This funding will be used to help to redirect surplus potatoes to organisations addressing food insecurity and support for the environmentally-sound disposal of surplus potatoes. It will also support marketing activities and help industry to develop long-term strategies to manage future challenges.

On **supply-managed commodities**, in its 2020 Fall Economic Statement, the government of Canada announced CAD 691 million (USD 515 million) over ten years for programmes specific to supply-managed chicken, egg, broiler hatching egg and turkey farmers. In April 2021, two programmes were announced to be launched in the financial year 2021-22. The *Poultry and Egg On-Farm Investment Program* aims to support on-farm investment in: (1) increasing efficiency or productivity; (2) improving on-farm food safety and biosecurity; (3) improving environmental sustainability; and (4) responding to consumer preferences (improving animal welfare, adopting alternative housing systems, transitioning to organic production, etc.). The non-repayable contributions of almost CAD 647 million (USD 516 million) are allocated to chicken (54%), turkey (12%), egg (21%) and broiler hatching egg (14%) producers. The *Market Development Program for Turkey and Chicken* is focused ono helping increase domestic demand and consumption of

Canadian turkey and chicken products through industry-led promotion activities. Funding will be distributed to national not-for-profit industry organisations working to improve the sector's market position: CAD 19.23 million (USD 15 million) for the Turkey Farmers of Canada and CAD 25 million (USD 20 million) for the Chicken Farmers of Canada.

On **food safety**, in 2021, the *Canada Grain Regulations* were amended. (1) The fees charged by the Canadian Grain Commission (CGC) for official inspection and official weighing were realigned with an adjusted grain volume forecast. (2) Canary seed was add to the list of seeds designated as grains for the purposes of the Canada Grain Act to ensure that their producers are eligible for compensation under the CGC Safeguards for Grain Farmers Program and for its other grain grading and quality assurance services. The amendments came into force on 1 August 2021.

On **food policy**, the Canadian Food Policy Advisory Council was established in February 2021 as an independent advisory body supporting the Minister of Agriculture and Agri-Food. Members of the Advisory Council are appointed by the Minister.

As part of Canada's preparations for the UN Food Systems Summit 2021, the AAFC and other organisations held a series of "Dialogues" which brought together a wide range of stakeholders on key elements of sustainable, equitable, and resilient food systems. Outcomes of the Canadian "Dialogues" have been used to identify national pathways towards sustainable food systems. In 2022, Canada will publish its National Pathways Document that uses a food systems lens to support progress on the Sustainable Development Goals and the Food Policy for Canada's vision.

Within the framework of the Food Policy for Canada, the federal government has been implementing several programmes planned for the period of 2019-24, including the Local Food Infrastructure Fund, the Food Waste Reduction Challenge, the Northern Isolated Community Initiatives and the AgriCommunication Initiative.

As announced in the 2021 Budget, the *Local Food Infrastructure Fund*, initially a five-year programme of CAD 50 million (USD 37.7 million), was enhanced by an additional CAD 10 million (USD 8 million) top-up. This programme aims to strengthen food support organisations and help improve access to safe and nutritious food for Canadians at risk.

In May 2021, the government of Canada launched the last two streams of the *Food Waste Reduction Challenge*. Up to CAD 6.5 million (USD 5 million) will be awarded to innovators of technologies that can extend the life of food or transform food that would otherwise be lost or wasted. The first two streams of this challenge were launched in November 2020 with awards totalling up to CAD 10.8 million (USD 8 million) dedicated to innovative business models that can prevent or divert food waste at any segment of the food supply chain.

In December 2021, the government of Canada launched the *AgriCommunication Initiative*, which is to contribute to better connecting Canadians with Canada's farmers, and promote consumer awareness of the strengths of Canada's agricultural sector. This initiative has two streams. The first stream, with financing of up to CAD 8 million (USD 6.4 million) over three years, aims to help Canadians better understand how their food is produced. Projects will also help enhance Canadians' trust in sustainability, animal care, and efforts to reduce food waste. As part of this stream, communications and awareness activities will be launched in spring 2022. The second stream of the initiative will focus on increasing the sector's understanding of consumer preferences and expectations.

In January 2021, the Canadian Northern Economic Development Agency (CanNor) launched the *Northern Food Innovation Challenge* to encourage the development of innovative solutions to food insecurity in the north. Innovation may include the development of a new product or process, but also adaptation of an existing product or process to work in a northern climate or in remote areas. This is the third stream financed through the *Northern Isolated Community Initiatives Fund*, totalling to CAD 15 million (USD 12 million) over five years, which supports community-led projects for local and indigenous food

production systems with an emphasis on innovative and practical solutions to increase food security across the north. The first stream, Support for Northern Food Business, provides funding to northern businesses and communities to build a strong territorial food industry and help reduce food insecurity using practical approaches, while the second stream, Support for Northern Territorial Food Systems, provides funding to territorial initiatives to increase economic opportunities in the territories related to growing, harvesting, and processing healthy food.

On **local food**, in January 2021, the government of New Brunswick (NB) released its new *Local Food and Beverages Strategy 2021-2025*. This four-year action plan aims to strengthen NB's food system and improve self-sufficiency through three core pillars related to production, marketing and the use of healthy local food within New Brunswick.

Domestic policy responses to the COVID-19 pandemic

Several **labour-related measures** were extended and enhanced in 2021. To ease the burden on Canadian employers, the government of Canada increased the funding of the *Mandatory Isolation Support for Temporary Foreign Workers (TFW) Program* to CAD 142 million (USD 113 million) in 2021. The programme intends to help with the impacts of the COVID-19 pandemic on food supply in Canada by assisting the farming, fish harvesting, and food production and processing sectors with some of the incremental costs associated with the mandatory 14-day isolation period, as well as cost associated with the 3-day hotel quarantine imposed under the Quarantine Act on TFWs.

To provide **food assistance** to food vulnerable populations during the pandemic, the *Emergency Food Security Fund*, introduced in 2020, was reinforced with additional financial resources, for a total announced value of CAD 330 million (USD 263 million) in December 2021.

At the provincial level, for example, the government of Quebec together with the federal government made available CAD 21.8 million (USD 17.4 million) in 2021 to livestock producers impacted by the slaughterhouse slowdown caused by the pandemic. The initiative (*Initiative Canada-Québec d'aide aux éleveurs pour atténuer l'impact de la COVID-19 en 2020-2021*) was aimed at alleviating their exceptional costs of keeping surplus animals on farms or carrying out the humane slaughter of surplus animals on the farm. This funding was provided through the AgriRecovery disaster relief framework.

Trade policy developments in 2021-22

On 1 April 2021, the *Canada–UK Trade Continuity Agreement* (TCA) came into force. The TCA substantively replicates the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), ensuring continuity in Canada's trade with the United Kingdom after 31 December 2020 (the end of the transition period after the United Kingdom leaving the European Union). The TCA maintains tariff elimination commitments for most agricultural exports, including products still subject to tariff phase-outs. The agreement continues Canada's duty-free quota access for beef, pork, bison, wheat, and processed sweetcorn, while not providing any additional market access for cheese or any other supply-managed products (dairy, poultry and eggs). The TCA is a transitional measure and includes a commitment by both parties to enter into negotiations on a new comprehensive bilateral trade agreement within a year of the TCA's entry into force, with a view to conclude within three years. The negotiations are expected to start in early 2022.

On 16 November 2021, Canada and the Association of Southeast Asian Nations (ASEAN) agreed to proceed with negotiations toward a comprehensive Free Trade Agreement. The first round of negotiations with ASEAN is expected to take place in 2022, when Canada completes its necessary domestic procedures for entering into trade negotiations.

On 20 June 2021, Canada and Indonesia agreed to proceed with negotiations toward a Comprehensive Economic Partnership Agreement (CEPA). The first round of negotiations is scheduled in 2022.

Contextual information

Canada is a large, wealthy country with a small population relative to its land area, and has relatively abundant land and water available to the agricultural sector. Primary agriculture accounts for less than 2% of GDP and employment (Table 7.3), but contributes to a larger share of economic output in some of the country's regions. Crop production is concentrated in the western prairies, where the typical farm is twice as large as the national average, is highly productive, and is largely for export. Most milk production is located in eastern Canada, which has relatively smaller farms and a larger variety of crops. Red meat industries are present across Canada, with beef cattle production being especially prominent in western Canada, and hog production concentrated in Quebec, Ontario and Manitoba.

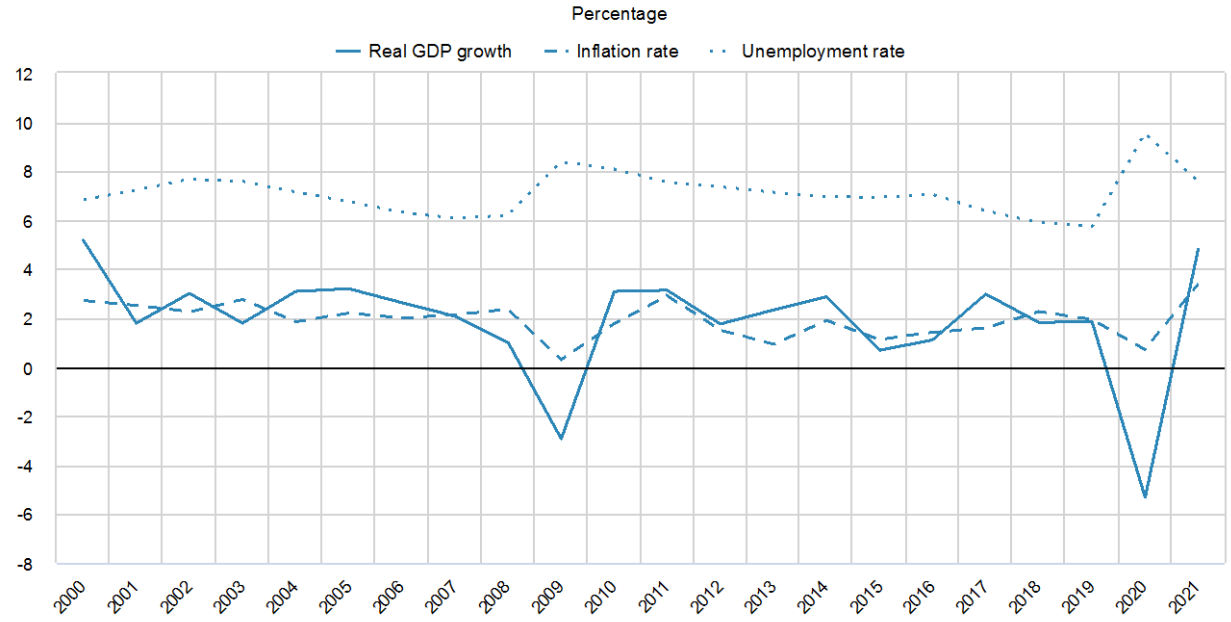
Table 7.3. Canada: Contextual indicators

	Canada		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	901	1 829	2.3%	1.7%
Population (million)	31	38	0.7%	0.7%
Land area (thousand km²)	8 966	8 966	11.0%	10.8%
Agricultural area (AA) (thousand ha)	61 287	58 157	2.0%	2.0%
			All countries[1]	
Population density (inhabitants/km²)	3	4	53	63
GDP per capita (USD in PPPs)	29 363	48 132	9 281	20 929
Trade as % of GDP	33	23	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	2.3	1.8	2.9	4.9
Agriculture share in employment (%)	3.3	1.9	-	-
Agro-food exports (% of total exports)	6.0	14.2	6.2	8.5
Agro-food imports (% of total imports)	5.0	9.2	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	43	61	-	-
Livestock in total agricultural production (%)	57	39	-	-
Share of arable land in AA (%)	67	66	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

For most of the past two decades, with the exception in 2009 related to the financial crisis, Canada enjoyed a stable macroeconomic environment characterised by relatively low inflation rates, fluctuating around its 2% target, and positive economic growth. However, the economy has been heavily affected by the COVID-19 pandemic and related restrictions, which caused a recession in 2020. In 2021, Canada's economy rebounded: its GDP grew to nearly 5% and the unemployment rate declined to 7.6% (Figure 7.5).

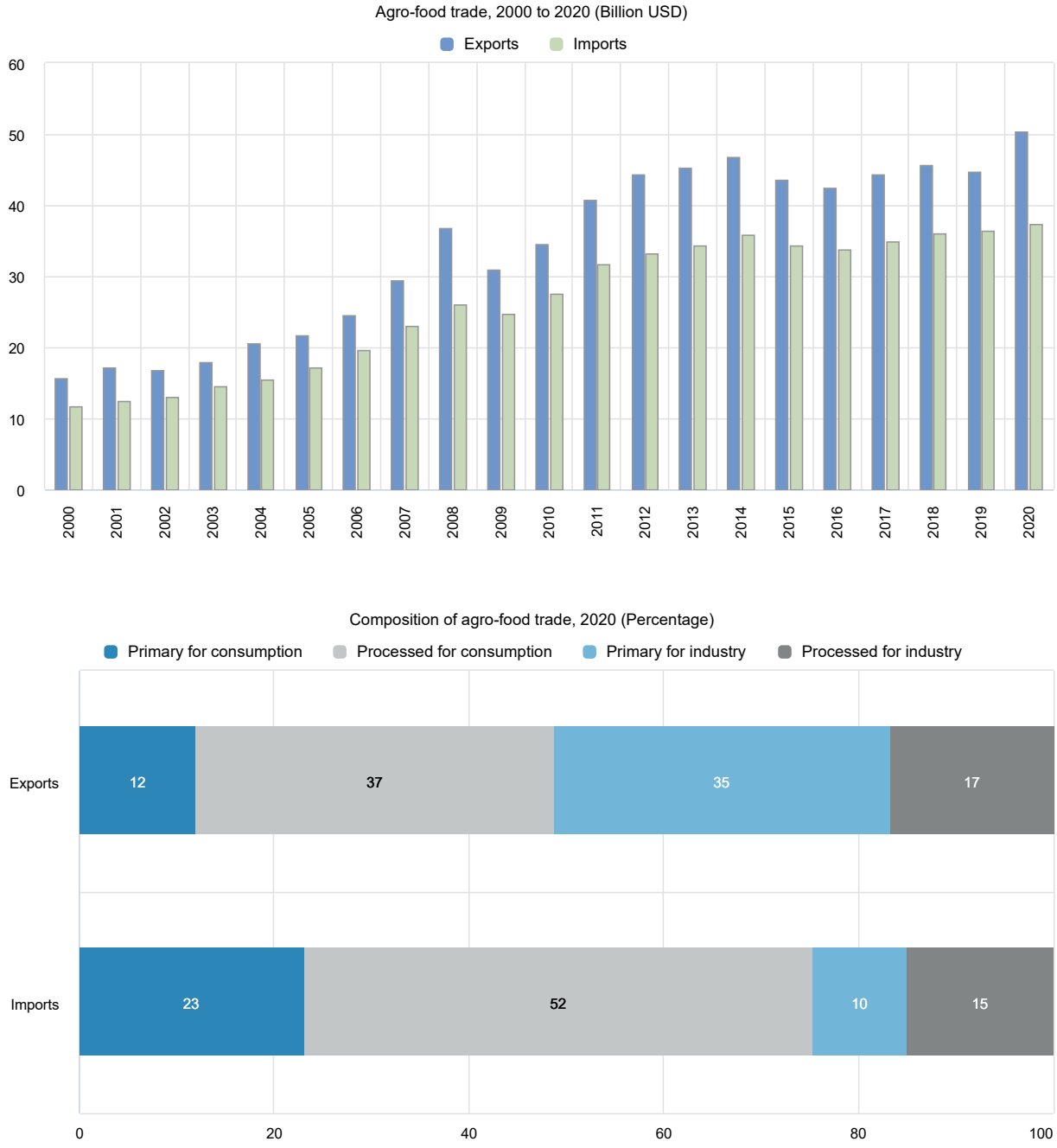
Figure 7.5. Canada: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Canada's economy is well integrated in international markets – as measured by the ratio of trade to GDP at 23% in 2020 (Table 7.3). Agro-food products represent 14% of total Canadian exports and 9% of imports. Canada is a large net exporter of agro-food products and access to export markets is highly important for the sector. More than half of Canada's agro-food exports are destined for the United States. Most of Canada's agro-food exports are either processed products intended for direct consumption (37%), or primary products for processing (35%). Canadian households' final consumption absorbs 75% of agriculture and food imports, of which two-thirds are processed goods (Figure 7.6).

Figure 7.6. Canada: Agro-food trade

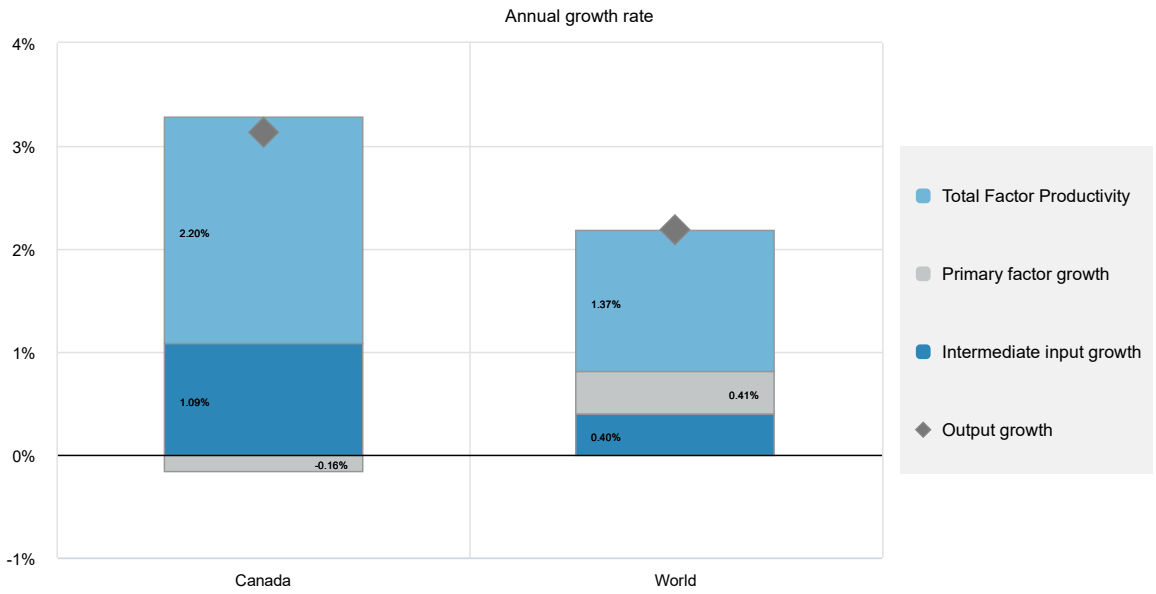


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

At 3.1%, Canada's agricultural output growth over the decade 2010-19 was above the global average. It was driven by rapid growth in Canada's agricultural productivity, as measured by total factor productivity (TFP), combined with further intensification in the use of intermediate inputs, in particular fertilisers (Figure 7.7). The agricultural output growth over the past decade has been achieved with either reduced or minimally increased pressure on natural resources, as shown in various environmental indicators.

Average nutrient surplus intensities have been stable since 2000 for nitrogen and decreasing for phosphorous. Both nutrient surpluses are below the average for OECD countries, as is the share of agriculture in Canada's GHG emissions (Table 7.4). The latter, after peaking in 2005, have remained largely stable.[10] This trend was mostly driven by a drop in emissions from livestock production, resulting from a reduced beef cattle population, largely offset by an increase in emissions from crop production, due to greater use of inorganic nitrogen fertilisers.[11]

Figure 7.7. Canada: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 7.4. Canada: Productivity and environmental indicators

	Canada		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	2.4%	2.2%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	24.0	23.7	32.1	30.0
Phosphorus balance, kg/ha	1.5	0.6	3.4	2.9
Agriculture share of total energy use (%)	2.2	3.5	1.7	2.0
Agriculture share of GHG emissions (%)	7.8	8.1	8.6	9.7
Share of irrigated land in AA (%)	1.2	1.0	-	-
Share of agriculture in water abstractions (%)	9.7	8.6	46.3	43.7
Water stress indicator	1.2	0.9	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Market price support to grains and oilseeds, which existed until the mid-1990s, resulted from the assistance provided to grain transportation which lower shipping costs for producers and consequently raised farm-gate grain prices. In 1989-90, the transportation subsidies covered about 70% of total freight costs with producers paying the remaining 30% (Doan, Paddock and Dyer, 2003[33]).

[2] In Canada, the term “agri-food” is more common and generally includes upstream industries in addition to agriculture and the downstream value-chain. In this chapter, policy measures related to the “agro-food” sector reflect this notion.

[3] The agricultural sector was responsible for 29% of the national methane (CH_4) emissions and 78% of the national nitrous oxide (N_2O) emissions in 2019 (Environment and Climate Change Canada, 2021[34]).

[4] “Climate-smart agriculture (CSA) is an approach that helps guide actions to transform agri-food systems towards green and climate resilient practices.” (Food and Agriculture Organization[36]); “Climate-smart agriculture (CSA) is an integrated approach to managing landscapes -cropland, livestock, forests and fisheries- that address the interlinked challenges of food security and climate change.” (World Bank[37]).

[5] The Climate Action Incentive Payment is a tax-free amount paid to help individuals and families offset the cost of the federal pollution pricing. It is available to residents of Alberta, Saskatchewan, Manitoba and Ontario, and consists of a basic amount and a supplement for residents of small and rural communities (Government of Canada, 2022[35]).

[6] The amount of greenhouse gas (GHG) emissions associated with all stages of fuel production and use per unit of energy.

[7] This is the evolution of the Natural Climate Solutions for Agriculture Fund announced in the 2020 Fall Economic Statement and as reported in the *Agricultural Policy Monitoring and Evaluation 2021* report (OECD, 2021[38]).

[8] In 2013, the reference margin limit (RML) was introduced in the face of rising commodity prices, for which some producers could have potentially triggered a payment on lost profit, rather than on lost income. The lower of the Olympic average reference margin or the producer's eligible expenses for the reference years was used as the reference margin in the payment calculation. Under the Canadian Agricultural Partnership (CAP), in 2018 a cap on the RML was introduced, which meant the producers' reference margin used in the payment calculation could not be reduced by more than 30%.

[9] In November 2021, the Canadian Food Inspection Agency temporarily suspended export certificates for fresh potatoes from Prince Edward Island to the United States in response to US concerns about potato wart.

[10] Canada's emissions from agriculture increased by 12 $MtCO_2eq$ or 26% between 1990 and 2019 (Environment and Climate Change Canada, 2021[34]).

[11] High beef prices caused a peak in cattle population in 2005, followed by a sharp decline in both prices and headcount (-27% by 2019) in the aftermath of an outbreak of bovine spongiform encephalopathy (BSE, or mad cow disease) in 2003. The increase in grain prices between 2007 and 2019 encouraged farmers to use more nutrient inputs and convert lands from perennial to annual crop production (Environment and Climate Change Canada, 2021[34]).

8 Chile

Support to agriculture

Chile's support to farmers is among the lowest among OECD countries at 2.7% of gross farm incomes in 2019-21, down from 7.3% in 2000-02. Since Chile reduced its tariff-based border protection during the first decade of this century, agricultural support creates very limited distortions to agricultural markets, with almost no market price support (MPS) to the sector, as domestic producer prices almost fully align with world prices. Therefore, single-commodity transfers are small, and limited to sugar and beef, for which they amount to 3% and 2% of respective gross receipts.

Budgetary support to producers mostly targets small-scale farmers, based on input use, particularly to support fixed capital formation. More than half of public expenditures in the sector go to general services (GSSE), especially for off-farm irrigation infrastructure, inspection and control, land access and restructuring, and agricultural knowledge and innovation systems. Expenditures for general services represented, on average, 3.3% of agricultural value of production in 2019-21, slightly below the OECD average. Total agricultural support represented 0.3% of GDP in 2019-21, half of the level in 2000-02.

Recent policy changes

In 2021, policies were implemented in accordance the four strategic pillars for 2018-22: (1) sustainability and water; (2) institutional modernisation; (3) promotion of farmer organisations; and (4) rural development. The Institute of Agricultural Development (INDAP) continued working on market access, associativity and access to water for smallholders.

The rural policy initiative began implementation in 2021. Different instruments for rural development were created to measure quality-of-life improvements in rural areas. In 2021, the Eighth Agricultural and Forestry Census was carried out. The results are expected for the second semester of 2022. The Sustainability Strategy for the Chilean Agri-food Sector launched in August 2021. It aims to identify the best agricultural practices for sustainable production of agricultural products. In 2021, the Office of Agricultural Policies and Studies (ODEPA) developed a system of indicators for monitoring and tracking this Strategy, expected to be implemented in 2022.

In 2021, the Agriculture and Livestock Service (SAG), Chile's national animal and plant agency, implemented several initiatives, including the creation of a regulatory committee to supervise and support the implementation of good regulatory practices within SAG. The SAG Digital Affidavit was extended for land and airport border controls in addition to those at Santiago's Airport. SAG also updated its phytosanitary regulations, removing a significant number of goods, such as highly processed wood, from the list of those subject to SAG inspections.

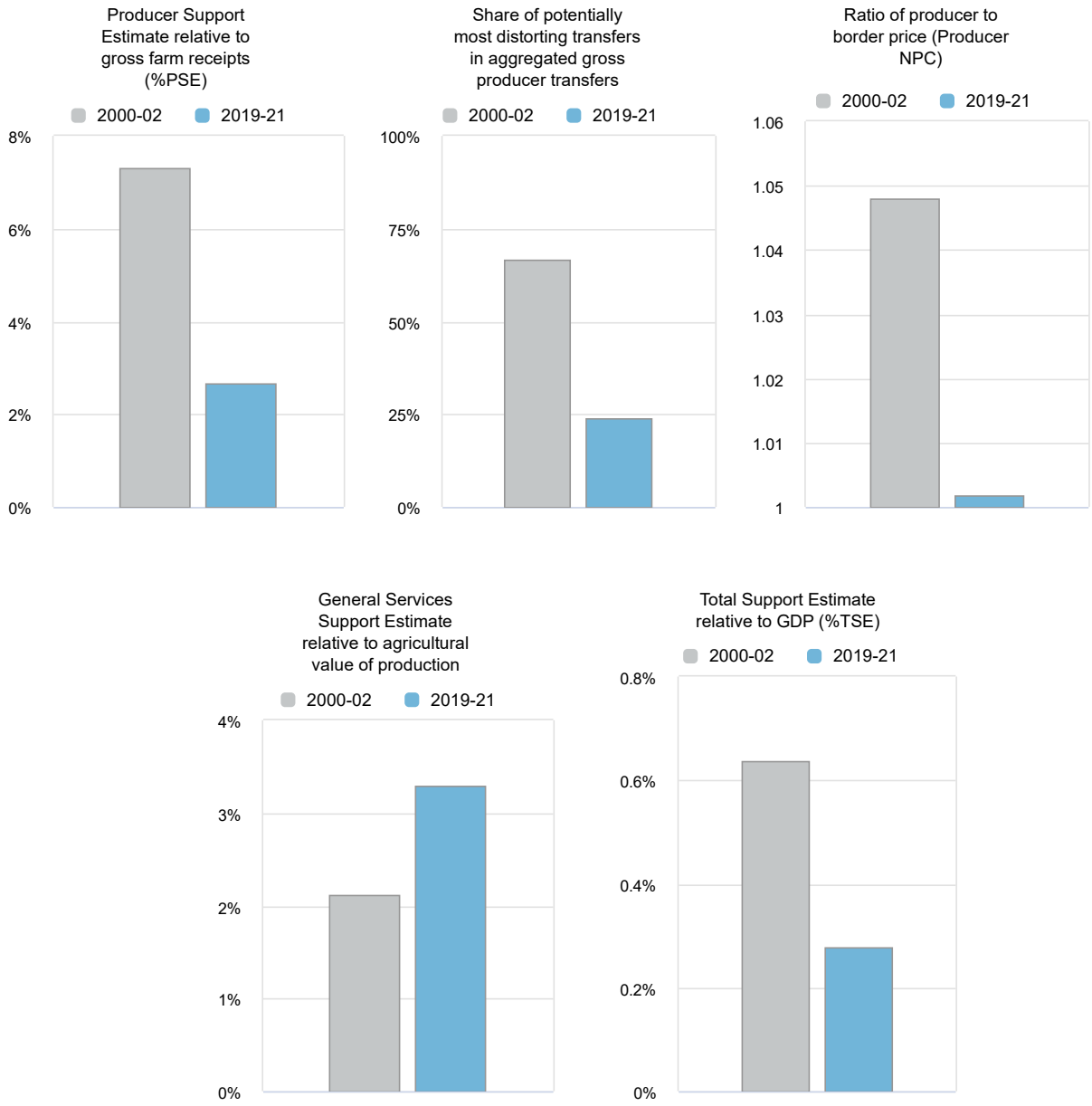
For animal health certification, the paperless electronic certificate was implemented with Russia, and work plans signed in 2021 with Korea and the United States to be implemented in 2022. Progress was made with the Pacific Alliance to implement the electronic exchange of certificates through single windows by 2022. Electronic phytosanitary certification was implemented with the Dominican Republic and tests were

carried out with Panama, Ecuador and Paraguay. Paper-based import certification tests were carried out with Spain and France. The paperless exchange is expected to begin with these countries in the first half of 2022.

Assessment and recommendations

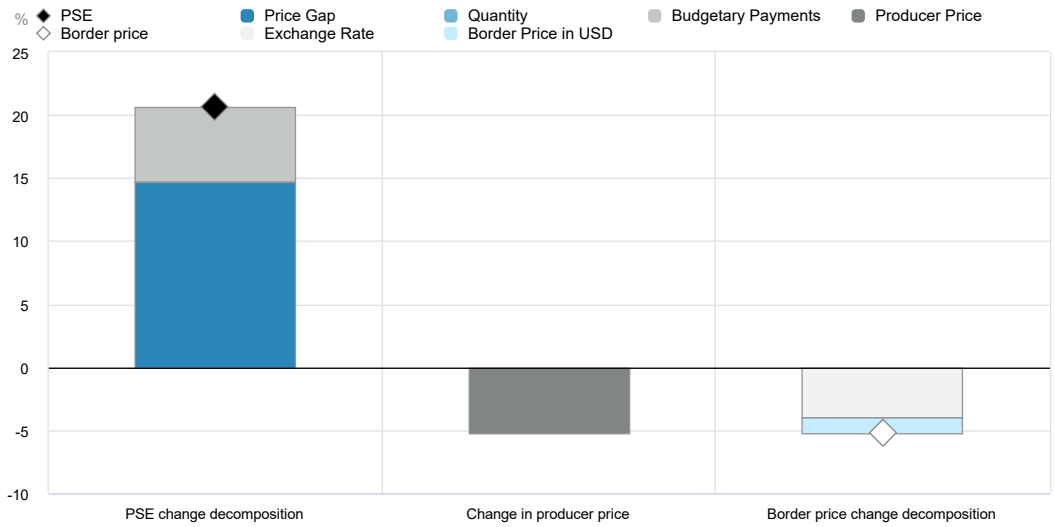
- Chile committed to achieve carbon neutrality by 2050, and significant efforts such as the Chilean Long Term Climate Strategy were developed relating to all sectors of the economy. The strategy contains nine objectives and 63 goals linked to the agricultural and forestry sector. These are limited to mitigation policies and practices, and Chile has no agricultural-specific mitigation target.
- Chile emphasises the provision of public services to the agricultural sector. As a result, general services (GSSE) account for 50% of total support to the sector, allocated mostly to irrigation infrastructure, inspection and control, and agricultural knowledge and innovation systems. Even so, expenditures are low relative to the value of agricultural production and could be scaled up.
- Payments to farmers target small-scale agriculture and indigenous farmers, who potentially are most in need. While these aim to improve productivity, competitiveness, recovery of degraded soils, and on-farm irrigation systems, attention should be paid to their effectiveness. Impact assessments should be systematic as these payments account for half of public outlays to the sector.
- Given the rising number of support programmes targeting rural populations not directly implemented by the Ministry of Agriculture, keys to ensuring efficient use of public resources are improved coordination across ministries and agencies that provide support to the agricultural sector, and strong systems of evaluation.
- Moreover, given the increasing number of support programmes by regional governments targeting rural populations, improved co-ordination, communication and accountability are needed between regional and national governments to avoid overlapping efforts and supports.

Figure 8.1. Chile: Development of support to agriculture



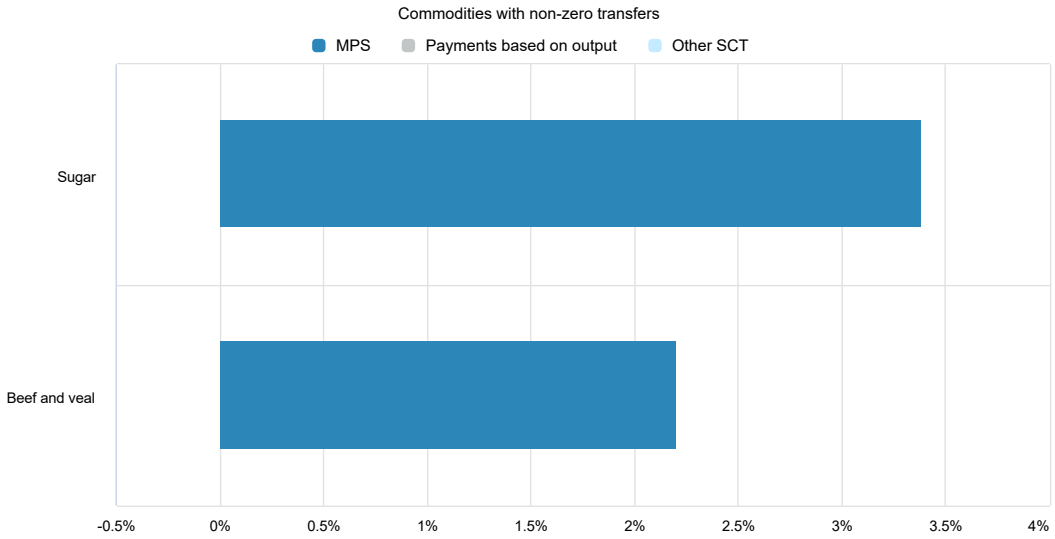
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 8.2. Chile: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 8.3. Chile: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 8.1. Chile: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**4 806**	**13 040**	**13 281**	**12 470**	**13 368**
***of which:** share of MPS commodities (%)*	72.86	73.17	71.39	73.12	74.99
Total value of consumption (at farm gate)	**4 118**	**10 588**	**9 649**	**9 897**	**12 218**
Producer Support Estimate (PSE)	**369**	**357**	**369**	**310**	**390**
Support based on commodity output	227	24	10	7	55
Market Price Support[1]	227	24	10	7	55
Positive Market Price Support	228	24	10	7	55
Negative Market Price Support	-1	0	0	0	0
Payments based on output	0	0	0	0	0
Payments based on input use	140	316	339	293	316
Based on variable input use	21	61	67	57	60
with input constraints	0	0	0	0	0
Based on fixed capital formation	85	174	184	161	179
with input constraints	66	86	89	77	91
Based on on-farm services	35	80	88	75	77
with input constraints	7	38	40	36	37
Payments based on current A/An/R/I, production required	1	17	21	11	20
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	1	17	21	11	20
with input constraints	1	17	21	11	20
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**7.31**	**2.66**	**2.71**	**2.43**	**2.85**
Producer NPC (coeff.)	**1.05**	**1.00**	**1.00**	**1.00**	**1.00**
Producer NAC (coeff.)	**1.08**	**1.03**	**1.03**	**1.02**	**1.03**
General Services Support Estimate (GSSE)	**103**	**430**	**454**	**390**	**447**
Agricultural knowledge and innovation system	22	69	75	61	70
Inspection and control	3	113	120	109	109
Development and maintenance of infrastructure	67	239	247	212	259
Marketing and promotion	10	10	13	7	9
Cost of public stockholding	0	0	0	0	0
Miscellaneous	1	0	0	0	0
Percentage GSSE (% of TSE)	**22.00**	**54.69**	**55.15**	**55.70**	**53.40**
Consumer Support Estimate (CSE)	**-317**	**-60**	**-26**	**-23**	**-133**
Transfers to producers from consumers	-226	-24	-10	-7	-55
Other transfers from consumers	-92	-37	-16	-16	-78
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	1	0	0	0	0
Percentage CSE (%)	**-7.51**	**-0.57**	**-0.27**	**-0.23**	**-1.09**
Consumer NPC (coeff.)	**1.08**	**1.01**	**1.00**	**1.00**	**1.01**
Consumer NAC (coeff.)	**1.08**	**1.01**	**1.00**	**1.00**	**1.01**
Total Support Estimate (TSE)	**472**	**787**	**823**	**700**	**837**
Transfers from consumers	318	60	26	23	133
Transfers from taxpayers	245	763	814	694	783
Budget revenues	-92	-37	-16	-16	-78
Percentage TSE (% of GDP)	**0.64**	**0.28**	**0.29**	**0.28**	**0.26**
Total Budgetary Support Estimate (TBSE)	**244**	**763**	**814**	**694**	**783**
Percentage TBSE (% of GDP)	**0.34**	**0.27**	**0.29**	**0.27**	**0.25**
GDP deflator (2000-02=100)	**100**	**248**	**228**	**247**	**268**
Exchange rate (national currency per USD)	**621.08**	**751.61**	**703.31**	**791.72**	**759.82**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Chile are: wheat, maize, apples, grapes, sugar, tomatoes, milk, beef and veal, pig meat, poultry, eggs, blueberries, cherries and peaches.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Prior to 1973, agricultural policies in Chile followed an import substitution industrialisation model. The country implemented measures such as price and production controls for staples (e.g. wheat), import tariffs, and export restrictions. At the same time, key institutions were created that remain in place, such as the Institute for Agricultural Development (INDAP - the smallholders' agency), the Agriculture and Livestock Service (SAG -animal and plant health institute), INIA (agricultural innovation agency), and others. During this period, the government also undertook land reform, providing land to small-scale farmers and landless people (Anderson and Valdés, 2008[1]).

Economic and agricultural policies shifted in 1973. Chile was the first country in the developing world to adopt market oriented open-economy reforms and structural macroeconomic reforms. These reduced the role of government in the economy and liberalised trade (OECD, 2008[2]).

From 1973-83, general reforms such as macroeconomic stabilisation went into effect while agricultural sector-specific reforms were deferred. However, marketing boards and price control agencies for agricultural products were dismantled, import tariffs were reduced and export restrictions were lifted. From the mid-1980s, the government took measures to improve competitiveness and stimulate production and exports, principally by providing general services to the sector. Several agricultural institutions related to innovation and irrigation were created, but smallholder development, the environment and resource use received little attention (Anderson and Valdés, 2008[1]).

Since the restoration of democracy in 1990, agricultural policy focuses on three objectives: (1) increasing competitiveness, (2) achieving more balanced agricultural development by better integrating poorer, less-competitive, farmers into commercial supply chains, and (3) preserving the environment through sustainable use of resources. Successive governments continued to commit to open markets. Tariffs were further reduced and numerous Regional Trade Agreements (RTAs) were signed, granting trade preferences to partners for agricultural products (OECD, 2008[2]) (Table 8.2).

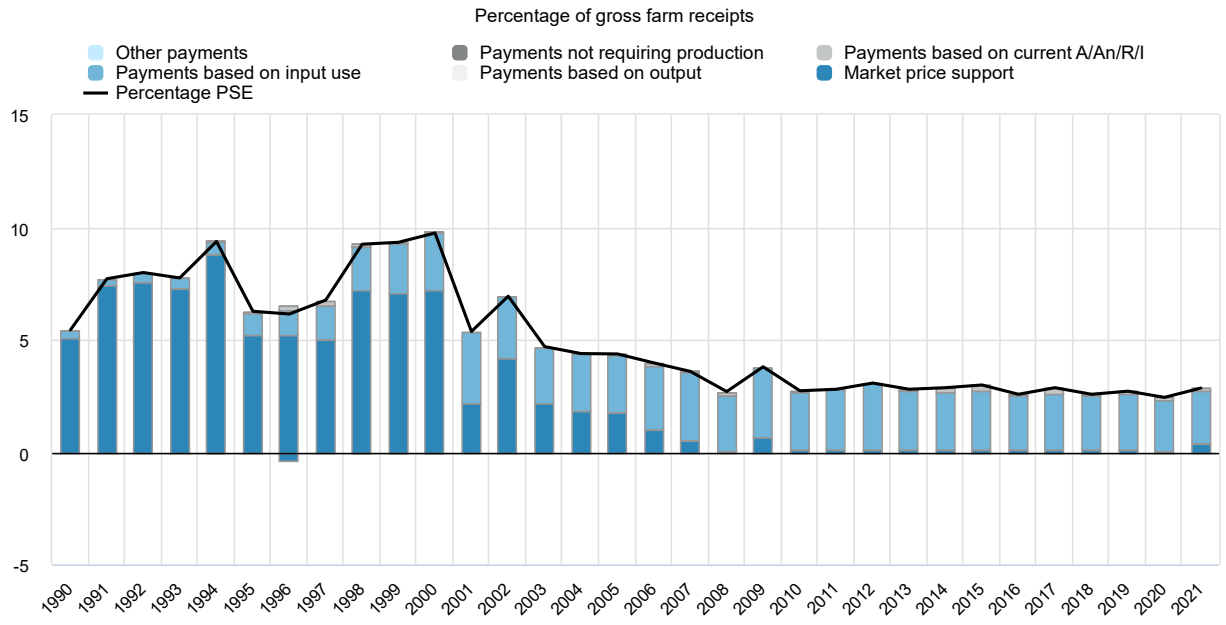
As market price support (MPS) has practically disappeared, Chile's level of producer support declined from close to 10% of gross farm receipts at the end of the 1990s to below 4% throughout the 2010s, and averaged 2.7% in the past three years. To some extent, MPS was replaced by payments related to agricultural input use, targeted to small-scale agriculture. Budgetary support also increased towards the provision of general services, which today account for half of Chile's total support estimate to agriculture.

Table 8.2. Chile: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1973	Import substitution industrialisation model Closed economy	High import tariffs Price controls (e.g. minimum prices of main agricultural products such as wheat, fixed consumer prices, fixed marketing margins) Export quotas, licenses and export bans on main staple foods Subsidies to some producers (e.g. milk) Interventions in input markets Investments in agricultural infrastructure (e.g. slaughterhouses, storage and processing facilities, roads) Establishment of key agricultural institutions (e.g. INDAP, SAG, INIA, COTRISA) Land reform

Period	Broader framework	Changes in agricultural policies
1973-1990	Reforms for trade liberalisation	Removal of agricultural price controls Dismantling of marketing boards and price control agencies, except for wheat, milk and oilseeds Rapid tariff reduction on most imports Introduction of a uniform, non-discriminatory tariff system Elimination of export restrictions Establishment of price stabilisation mechanisms (price band systems) for imported products (wheat, sugar and oilseeds) Creation of further agricultural institutions (e.g. FIA, CNR)
1990- present	Return to democracy continues with open markets model	Most Favoured Nation tariff reduction up to 1% by 2020 for all agricultural products Many free trade agreements signed Dismantling of the price band systems for sugar and oilseed Increase in budgetary allocation to support smallholders and for investments in general services

Figure 8.4. Chile: Level and PSE composition by support categories, 1990 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Agricultural policy continues to emphasise the development of small-scale agriculture, the improvement of sustainable productivity and competitiveness, and the conservation of natural resources. Half of budgetary expenditures spent on agriculture are direct payments to small-scale farmers, which include variable input subsidies and subsidies for capital formation, as well as access to credit at preferential interest rates; subsidies for fixed capital formation, in particular improving degraded soils; and on-farm services such as producer association programmes for small-scale and indigenous farmers. The other half of the budget is

spent in general services to the agricultural sector, such as investments in infrastructure, mainly the expansion and improvements of irrigation systems, restructuring of and access to land, agricultural research and development, sanitary and phytosanitary services and inspection services.

Chile is an open trade country, which has helped it to become an important producer and exporter of agricultural and food products such as fruits, vegetables, dairy products, poultry, pig meat and wine. Market price support has declined over the years and most favoured nation (MFN) tariffs for agricultural products have fallen to around 1%.

Climate change mitigation policies in agriculture

Chile's Nationally Determined Contribution (NDC) committed to carbon neutrality by 2050 and takes a carbon budgeting approach. This means Chile commits to a greenhouse gas (GHG) emissions budget limit of 1 100 Mt CO_2eq between 2020 and 2030, peaking emissions in 2025. In 2030, GHG emissions shall not exceed 95 Mt CO_2eq. In line with this commitment, Chile launched the Long-Term Climate Strategy (LTCS) at COP26 in 2021. Agriculture is an important contributor to GHG emissions, with 10.5% of national emissions in 2018. GHG emissions for agriculture correspond 55% to enteric fermentation and manure management, and 40% to agricultural soils. The LTCS strategy contains nine objectives and 63 goals linked to the agricultural and forestry sector. These goals are related to capacity building, agricultural R&D, agricultural extension services, reduction of GHG emissions, increasing carbon sequestration, and strengthening climate change governance. The nine objectives are:

1. Create and strengthen institutional and territorial capacities in the agricultural and forestry sector to face the challenges of climate change, especially for the most vulnerable producers.
2. Promote R&D and rural extension that contribute to climate action to develop resilient and low-emission agricultural and forestry sectors.
3. Promote agri-food systems that are low in GHG emissions through the efficient and sustainable use of natural resources to ensure the production of food.
4. Reduce vulnerability and generate resilience in the agricultural and forestry sectors, promoting the implementation of adaptation measures to climate change to contribute to food security.
5. Strengthen the Ministry of Agriculture's institutions on climate change.
6. Promote initiatives focused on avoiding and/or reducing deforestation and the degradation of vegetation resources, contributing to mitigation and adaptation to climate change, and reducing the occurrence and risk of forest fires.
7. Promote the management and conservation of native vegetation resources (forests and xerophytic) and wetlands, directing it towards the production of ecosystem goods and services, nature conservation and the needs of local communities.
8. Promote initiatives to increase the creation of forests and the permanent coverage of vegetation resources in priority areas for restoration at the landscape scale, increasing resilience and reducing the vulnerability of communities and territories.
9. Promote participation in the design of actions and policies with a gender approach and emphasis on local communities and indigenous peoples, considering respect for the rights of people and their cultural heritage.

In line with the LTCS strategy, the Ministry of Agriculture will start to implement climate change mitigation initiatives in 2022, starting with activities such as the efficient use of fertilisers, improved emission reduction treatments for pig manure, and sustainability standards with mitigation actions for three agri-food subsectors: dairy, poultry and pork. The initiatives also include soil improvement programmes incorporating soil management practices that capture carbon and contribute to climate change mitigation. A roadmap for cattle carbon neutrality is under development. Efforts to prevent and reduce food losses and waste (FLW),

such as improving information on FLW, carrying out studies at the processing level to identify areas of waste, and others, took place. Moreover, the country consolidated the GHG Inventory and Prospects System of the agriculture, livestock and forest sectors.

Domestic policy developments in 2021-22

In 2021 policies were implemented in accordance with the four strategic pillars for the period 2018-22: a) sustainability and water; b) institutional modernisation; c) promotion of farmer associativity; and d) rural development. The Institute for Agricultural Development (INDAP) continued modernising the governance of three of its programmes: the Local Development Programme (PRODESAL), the Agricultural Programme for the Comprehensive Development of Small Farmers of the Coquimbo Region (PADIS), and the Technical Advice Programme (SAT). By 2021, 254 municipalities had signed agreements with INDAP for PRODESAL; and that 1 564 farmers were migrated from PRODESAL to SAT programmes due to the new characterisation criteria of INDAP's beneficiaries.

During 2021, INDAP continued working on encouraging market access through the promotion of smallholders' associativity. The main outcomes of this work, was that for 2021 there were 551 new rural smallholders associative companies accredited by INDAP that received INDAP's support through some of its main policy instruments such as productive alliances, rural market, marketing agreements, and public purchase. These new organisations represented an increase of 110% compared to 2017.

INDAP signed, in 2021, a collaboration agreement with the Indigenous Development Corporation (CONADI), through which INDAP received financial resources from CONADI for the construction of more than 800 wells for small-scale indigenous producers in the Biobío, Araucanía, Los Ríos, and Los Lagos regions. INDAP also signed a collaboration agreement with the General Directorate of Water (DGA), through which the DGA received financial resources from INDAP to implement a work programme at national level in five lines of action: user organisations; rights of use of individual waters; water use surveillance; monitoring of effective extractions; and dissemination and training, to improve smallholders' agricultural water access.

The Origin Seal (*Sello Originario)* was created to identify several brands and products associated with healthy ancestral foods. The Seal identifies healthy food products produced by smallholders from indigenous communities. Around 2 000 products received the Seal, benefiting 316 small-scale farmers.

The rural policy initiative started its implementation in 2021. Different instruments for rural development were created to measure quality of life improvements in rural areas such as the Indicators System of Rural Quality of Life, the Methodological Guides for Regions and Municipalities, and the Rural Atlas. Also a National Council was created, with members from the public and private sectors, academia and civil society, to facilitate implementation of the Rural Policy. The OECD Principles for Rural Policy have been an important guide in this process (OECD, 2019[3]).

The Foundation for Agricultural Innovation (FIA) opened new offices in the north and extreme south of the country, regions where there were no offices before. After an institutional modernisation process, FIA provides financial resources to farmers according to their stage of the innovation cycle. Likewise, FIA modernised its internal management processes to improve its efficiency in delivering support and solutions to the agricultural sector.

In 2021, the VIII Agricultural and Forestry Census was carried out. The results are expected for the second semester of 2022. Likewise, a plan to strengthen agricultural statistics has been carried out, incorporating new information, with special emphasis on production. At the same time, improvements have been applied to current statistics to monitor production chains, including information related to the use of raw materials and the participation of producers in different sales channels, among others.

The Sustainability Strategy for the Chilean Agri-food Sector was launched in August 2021. The strategy was developed through a participatory methodology which included public-private meetings, regional workshops and a public consultation process involving farmers associations, agribusiness associations, academia, NGOs, and public sector. The Strategy aims to identify the best agricultural practices for a sustainable production of different agricultural products. In 2021, the Office of Agricultural Policies and Studies (ODEPA) developed a system of indicators for the monitoring and tracking of this Strategy which is expected to be implemented in 2022. The Strategy's governance as well as a first implementation plan are expected to be created in 2022.

In 2021, the Agriculture and Livestock Service (SAG), the animal and plant national agency, implemented some initiatives. The newly created Regulatory Committee aims to supervise and support the implementation of Good Regulatory Practices within SAG. The SAG Digital Affidavit was extended for land and airport border controls in addition to those carried out at Santiago's Airport. SAG also updated its phytosanitary regulations, thereby removing a significant number of goods, such as highly processed wood, from the list of those subject to SAG's inspections.

During 2021, SAG adjusted the organisational structure of its laboratories, establishing a Network of Laboratories with a central laboratory in the capital and regional laboratories across the country. A food safety department was created, conducting activities that used to be carried out by agricultural and livestock laboratories. These new laboratories became a plant and seed health laboratory and an animal health laboratory, respectively. A new law enacted in 2021, mandates norms on composition, labelling and commercialisation of fertilisers.

For animal health certification, the paperless electronic exchange was implemented with Russia and work-plans were signed in 2021 with Korea and the United States to be implemented during 2022. Progress was made with the countries of the Pacific Alliance to implement the electronic exchange of certificates through single windows by 2022. In phytosanitary certification, electronic certification was implemented with the Dominican Republic and tests were carried out with Panama, Ecuador, and Paraguay. On the other hand, import certification tests were carried out with Spain and France. The paperless exchange is expected to start with these countries during the first half of 2022.

In 2021, under the INDAP's framework for Climate Change Adaptation Committee established in 2019, several workshops were carried out in the 16 regions of the country with the participation of more than 800 of INDAP's beneficiaries and experts. Within these workshops an assessment was carried out to evaluate the main problems and potential solutions in terms of water access and climate risks for farmers. The main findings of the assessment and workshops will be finalised in 2022 and will be used as a basis for the design of public policies.

Lastly, the update of the climate change adaptation plan for agriculture has continued with the planned activities. This update includes the formation of 16 subnational technical committees, a governance structure officially established, the development of the participatory process in the 16 administrative regions of the country and the design of a pilot climate change adaptation plan in the *Aysén* region.

Domestic policy responses to the COVID-19 pandemic

In response to the health crisis of COVID-19, INDAP activated an emergency credit programme in 2021, benefiting 4 766 smallholders of certain areas of the country. Moreover, a special credit renegotiation measure was created for all INDAP credit beneficiaries, except for farmers with marketing credit "*Creditos de Enlace"*. The renegotiation implied that 50% of non-paid interests were written off, while repayment of credit principals was renegotiated taking into account the creditor's payment capacity and, depending of the type of credit, up to a maximum of 10 years. This measure ended in 31 December 2021.

Lastly, the Ministry of Agriculture has been in direct coordination with other ministries in order to present and implement national programmes to reactivate the economy and employment, the Ministry of

Agriculture and the Ministry of Labour developed a communicational strategy to inform about the compatibility of formal employment and public supports to people. The Ministry of Agriculture has also coordinated with the Ministry of Transport for the implementation of the Collaborative Logistic Plan (*Plan de Logística Colaborativa*) which aims to improve logistics of main port terminals of the Valparaiso region, in order to avoid supply chain disruptions and to improve their efficiency.

Trade policy developments in 2021-22

To deepen bilateral preferential trade, ongoing negotiations to broaden the Partial Scope Agreement (PSA) with India and modernise the FTA with Korea continued in 2021 and are expected to continue in 2022. Negotiations with the European Union and the European Free Trade Association (EFTA) continued in 2021. The negotiations for an FTA with Paraguay were concluded in 2021, with agreement pending approval by the Chilean Congress. During 2021, negotiations with Trinidad and Tobago began for a Partial Scope Agreement (PSA).

Access to the market for the People's Republic of China (hereafter "China") was agreed for live equines, as well as for 13 additional types of frozen fruits, chilled beef, sheep, and goat meat. Access to the Korean market was secured for live equines.

In 2021, Chile signed a Memorandum of Understanding (MoU) on agricultural co-operation with Indonesia. A MoU on agricultural co-operation was signed with the Philippines in January 2022, and another one is expected to be signed with Thailand during 2022. Negotiations will continue in 2022 for MoUs in mutual recognition of organic products certification with Korea, Japan, and China.

Contextual information

Chile has averaged a real GDP growth of around 4% since 2000 that helped it to become an upper middle-income country. Agriculture accounted for 4.2% of GDP and 7% of total employment in 2020. It has a dual structure, in which small-scale labour intensive farms co-exist alongside a large-scale commercial farm sector. Chile is a net exporter of agro-food products with a surplus of around USD 5.3 billion (excluding fish and forestry) in 2020. Agro-food products accounted for 17.3% of Chile's total exports, and for 12.5% of its imports.

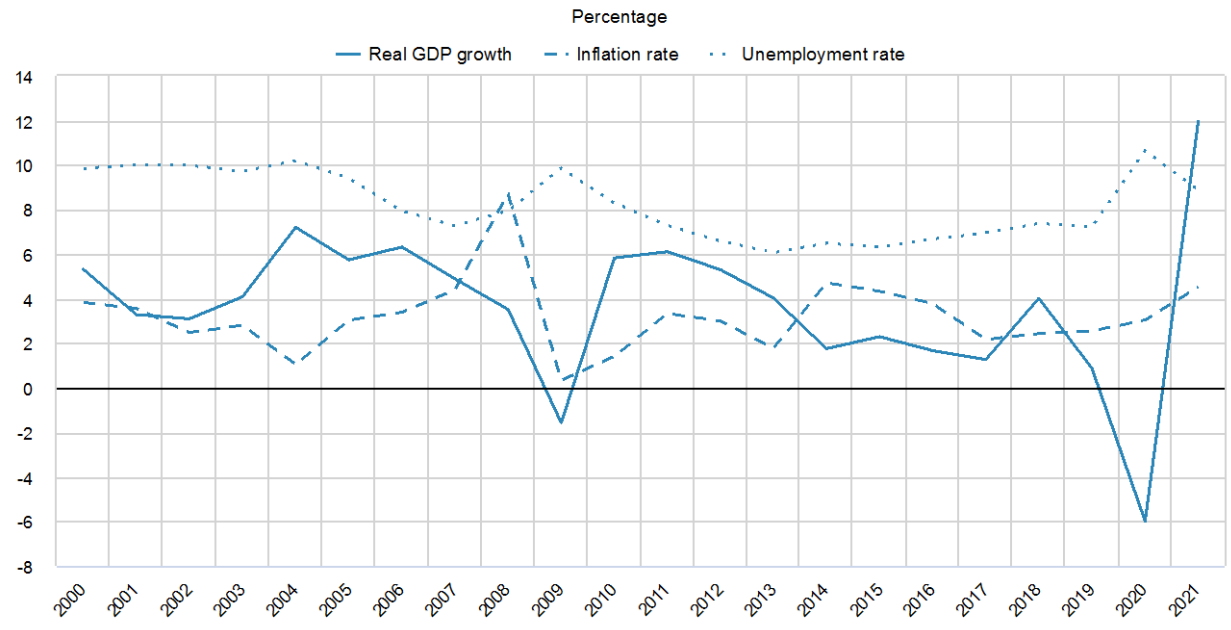
Table 8.3. Chile: Contextual indicators

	Chile		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	147	479	0.4%	0.4%
Population (million)	15	19	0.4%	0.4%
Land area (thousand km^2)	744	744	0.9%	0.9%
Agricultural area (AA) (thousand ha)	15 110	15 671	0.5%	0.5%
			All countries[1]	
Population density (inhabitants/km^2)	21	26	53	63
GDP per capita (USD in PPPs)	9 519	24 648	9 281	20 929
Trade as % of GDP	22	26	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	5.9	4.2	2.9	4.9
Agriculture share in employment (%)	14.1	7.0	-	-
Agro-food exports (% of total exports)	17.0	17.3	6.2	8.5
Agro-food imports (% of total imports)	7.7	12.5	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	68	63	-	-
Livestock in total agricultural production (%)	32	37	-	-
Share of arable land in AA (%)	12	7	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

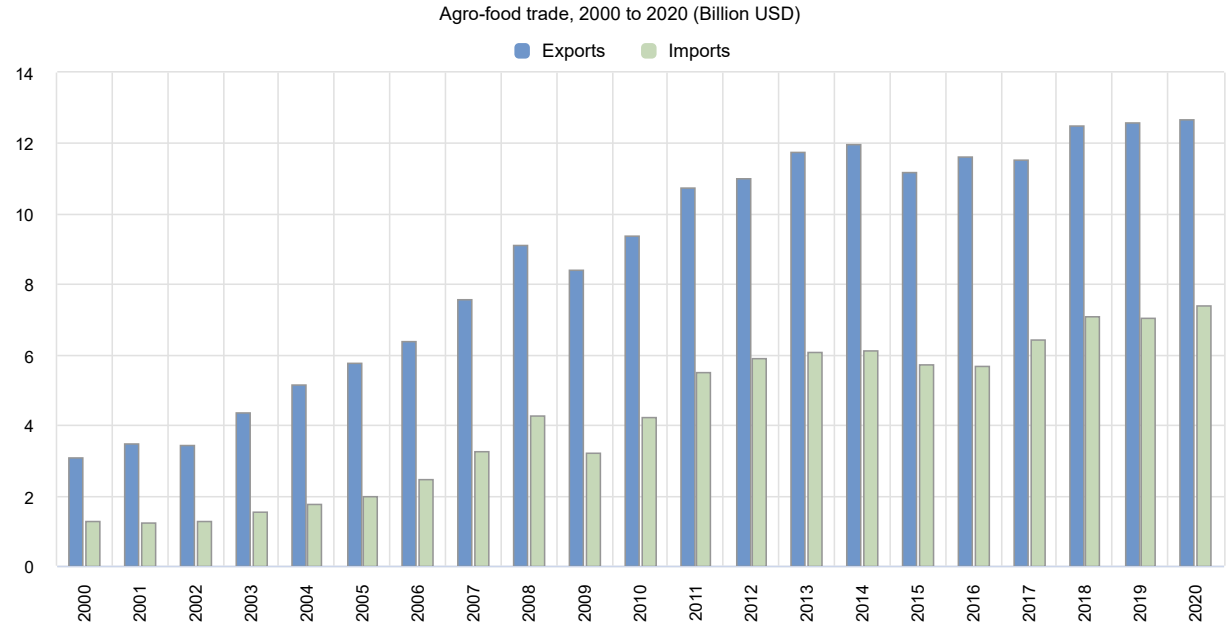
After a 6% contraction in 2020 as a consequence of the COVID-19 pandemic, Chile's economy strongly rebounded and grew by 12% in 2021. The country's unemployment rate decreased from 10.7% in 2020 to 8.9% in 2021, and inflation was around 4% the same year. Chile's agricultural and agro-food sector has been successful in adding value to the production of primary commodities, by producing more differentiated products such as temperate fruits, and processed products such as wine. In 2020, 85% of agro-food exports were products for final consumption, both primary and processed, and only 14% were products for further industrial processing. Agro-food imports were mostly processed products, in which 52% were for consumption and 24% for further processing in industry.

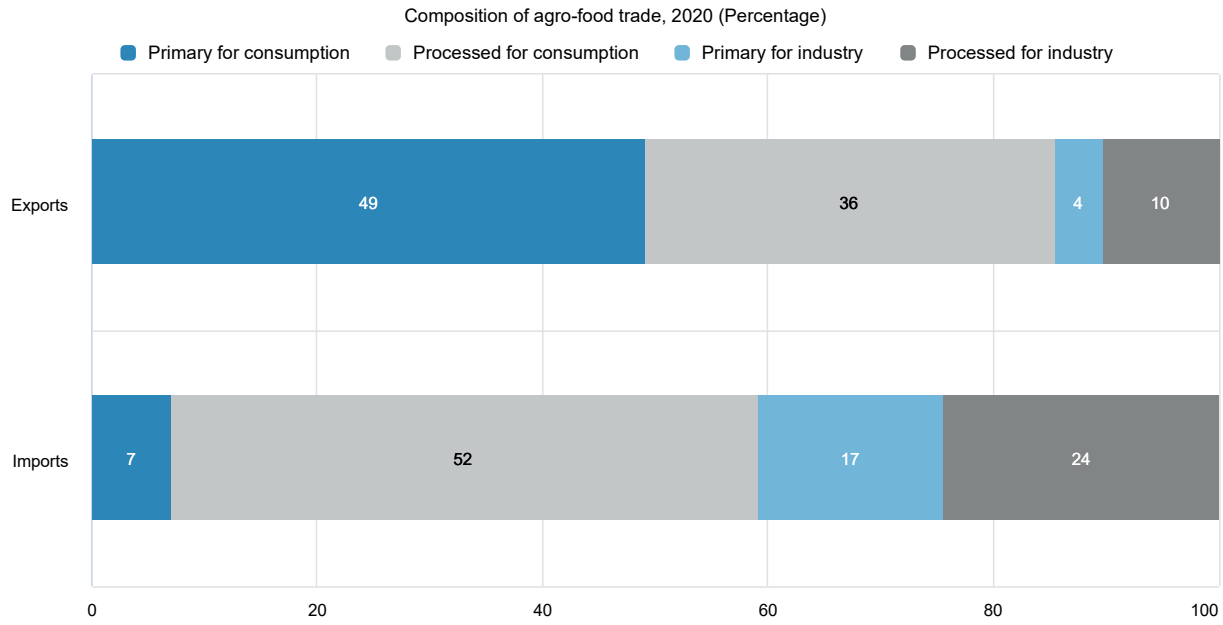
Figure 8.5. Chile: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 8.6. Chile: Agro-food trade

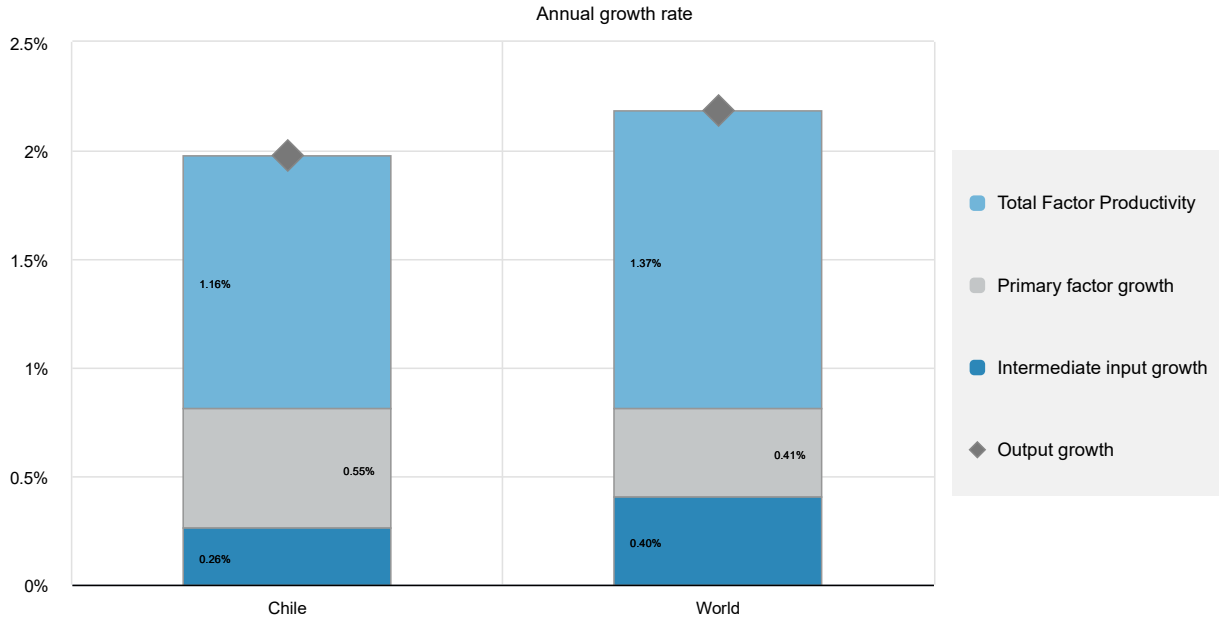




Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Productivity growth has been the dominant driver for Chile's growing agricultural production. Supported by some additional use of primary and intermediate inputs into production, output growth averaged 2% p.a. and has been mainly achieved by improvements in total factor productivity (TFP), which has grown by an average of 1.2% per year over the period 2010 to 2019, slightly below the global average. Agriculture accounts for around 11% of Chile's GHG emissions, similar to the OECD average but well above its contribution to the GDP. Around 7% of the total agricultural land is irrigated.

Figure 8.7. Chile: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 8.4. Chile: Productivity and environmental indicators

	Chile		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	3.6%	1.2%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	..	..	32.1	30.0
Phosphorus balance, kg/ha	..	..	3.4	2.9
Agriculture share of total energy use (%)	..	1.7	1.7	2.0
Agriculture share of GHG emissions (%)	18.8	10.5	8.6	9.7
Share of irrigated land in AA (%)	7.0	7.0	-	-
Share of agriculture in water abstractions (%)	..	..	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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9 China

Support to agriculture

The share of support to agricultural producers in the People's Republic of China (hereafter "China") averaged 14.8% of gross farm receipts in 2019-21. This is three times higher than in 2000-02 but remains on par with the average support during 2016-18 (14.5%), when reforms were implemented in market intervention for soybeans, rapeseed, cotton and maize, and in the minimum purchase price for wheat and rice. These reforms stabilised support levels after two decades of steady growth.

The increase in producer support in 2019-21 is largely driven by a significant increase in market price support (MPS) for grains and oilseeds against a backdrop of domestic prices rising faster than border prices. Minimum purchase prices for wheat and rice were increased in 2020-21, while constraints in the supply of maize and soybeans for animal feed and groundnuts have led to large increases in domestic prices and imports for these commodities. In addition, domestic prices for livestock commodities such as beef or poultry meat have been increasing due to more demand for these products in response to tighter supplies of pig meat. Furthermore, area payments to maize and soybeans increased to support production in these sectors. Area payments within the Agricultural Production Development increased to offset rising production costs, and contributed to the overall increase in support in 2020-21.

Payments based on planted area have consistently increased since 2014 as a result of the recent reforms, but MPS remains the dominant part of total support, generated through both domestic price support policies and various border measures on imports. Overall, more than two-thirds of support to producers is in the form of potentially most-distorting transfers, a consistent share since 2000-02.

MPS levels differ across imported commodities, while prices of exported commodities are not supported. Except eggs, apples, and other fruit and vegetables that are exported, producers benefited from transfers of 8% to 58% of commodity receipts in 2019-21. Prices received by farmers were 14% higher on average than world prices in 2019-21. Higher domestic producer prices on average indicate an implicit tax on consumers, with a percentage consumer support estimate of –12.7% in 2019-21.

Within the general services support estimate (GSSE), which corresponds to 12.2% of total support to agriculture in 2019-21, three categories attract the largest financial support: public stockholding; development and maintenance of infrastructure; and the agricultural knowledge and innovation system. However, at 2.2% relative to the value of agricultural production, the GSSE is below the OECD average. Total support to agriculture as a share of GDP (%TSE) has remained relatively stable since 2000-02. At 1.8% in 2019-21, %TSE was nevertheless among the highest of countries covered, over three times the OECD average.

Recent policy changes

The 14th Five-Year Plan 2021-25 for National Economic and Social Development issued in March 2021 outlines among key priorities maintaining subsidies for grain producers and increasing minimum purchase

prices for wheat and rice as appropriate. The November 2021 Five-Year Plan for Promoting Agricultural and Rural Modernization 2021-25 and the February 2022 Central No.1 Document set the mid-term objective of annual production of grains at a minimum of 650 million tonnes. In this context, the National Development and Reform Commission (NDRC) in February 2021 raised the minimum purchase prices for indica rice and wheat by 1%. In October 2021, the NDRC increased the minimum purchase price for wheat for procurement in 2022 by 1.8%. In February 2022, minimum purchase prices were increased for early indica rice by 1.8% and for late indica and japonica rice by 0.8%.

In June 2021, the Ministry of Agriculture and Rural Affairs (MARA) provided an additional CNY 20 billion (USD 3.2 billion) subsidy to grain farmers to address increasing input costs. This was incorporated into the programme of Agricultural Production Development and extended in March 2022 for another year.

In December 2021, MARA released the 14th Five-Year Plan for the Development of the Livestock Sector, consolidating the self-sufficiency rates set by the State Council in 2020 for the livestock sector: 95% for pig meat production; 85% for beef and mutton; 70% for milk; 100% for poultry and eggs. Starting in January 2022, the tariffs for pig meat and pig meat products were also raised from 8% to 12%.

In October 2021, the General Administration of China Customs (GACC) introduced new customs regulations requiring additional inspections of fertiliser exports. The new inspection requirements cover 29 categories of fertilisers.

The Regulations on the Registration and Administration of Overseas Producers of Imported Food (General Administration of Customs China Decree 248) entered into force on 1 January 2022. The regulations require all foreign food manufacturers, processors and storage facilities to be registered with Chinese authorities to export agri-food products to China.

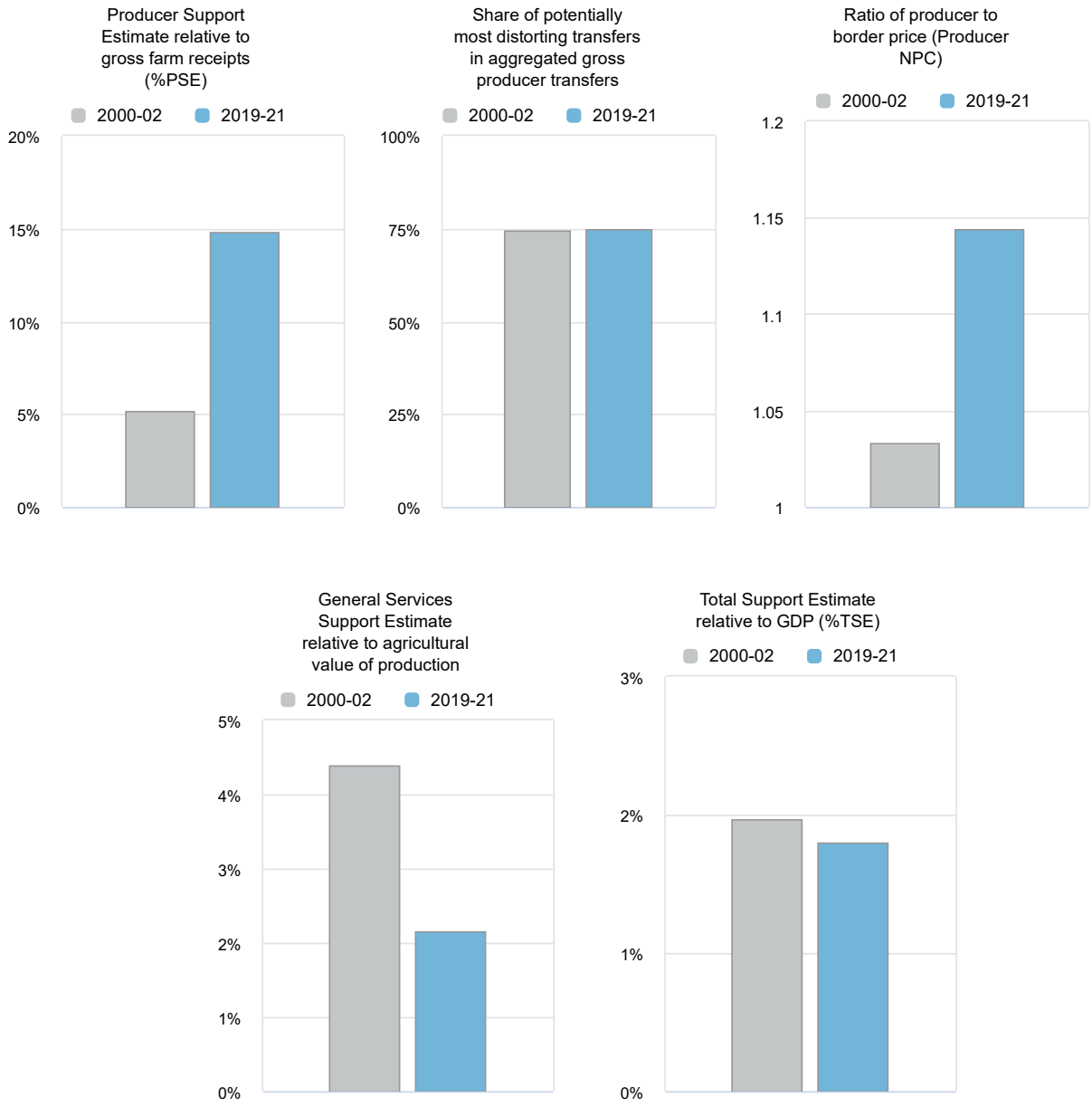
Assessment and recommendations

- China's Nationally Determined Contribution (NDC) recognises agriculture's importance to its economy-wide emission-reduction target (peak CO_2 emissions by 2030) and its objective to achieve carbon neutrality by 2060, but no targets have been set for the sector. Nevertheless, several sector-specific policy efforts aim to mitigate greenhouse gas (GHG) emissions by focusing on fertiliser efficiency, lowering emissions from rice cultivation, agricultural biogas production, improved livestock feed and farming practices, conversion of cultivated land at risk of erosion to forest, and food waste reduction. These efforts should be enhanced and the monitoring of their impacts on GHG emissions improved through well-defined targets. In this sense, the implementation of the National Agriculture Green Development Plan 2021-25 – a joint effort between various ministries and institutions – can provide the tools for the monitoring of GHG mitigations practices at farm level and along the value chain.
- Several plans were put forward across institutions including MARA and the Ministry of Ecology and Environment to strengthen policies supporting the sector's adaptation to climate change. In this context, the implementation of the National Agriculture Green Development Plan 2021-25 could also help mainstream and co-ordinate adaptation policy objectives across current and planned programmes, including better targeting of extension services for farmers.
- The reforms introduced until 2016 to replace intervention prices for key crops by direct payments based on area planted are a positive step in the direction of rebalancing the policy portfolio. This reflects China's increasing policy orientation towards long-term productivity growth and sustainability. The reform of the maize purchasing and storage system towards direct payments eased the burden of public stockholding costs, which still represent the largest expenditure share in general services support. Such reforms could be gradually extended to include wheat and rice. If direct payments to farmers are maintained over a longer-term, the link between these payments

and production decisions should be loosened, for instance by providing payments on a historical area basis, and 'greened' by making them conditional on environmentally friendly production practices.

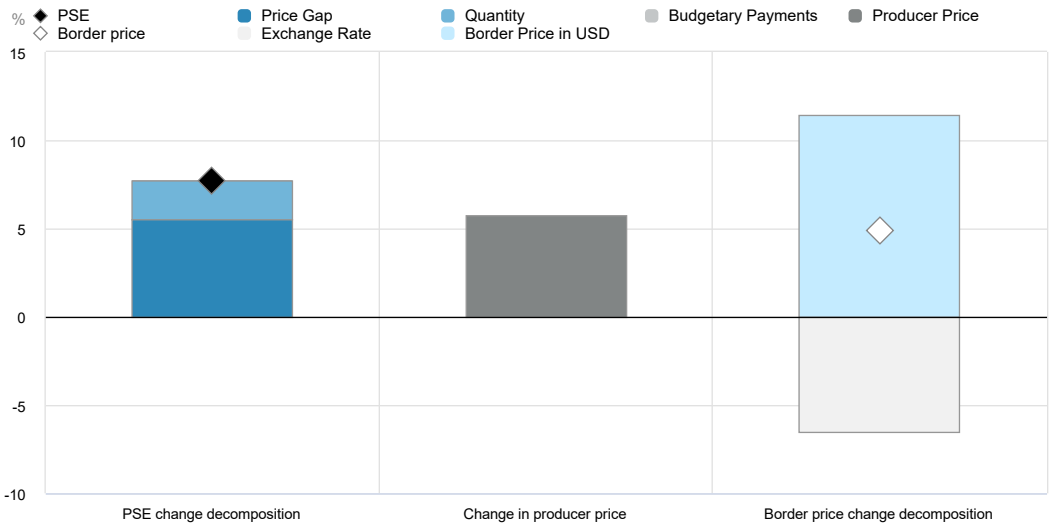
- To establish a solid framework for agri-environmental policies, China should define environmental targets adapted to local ecological conditions and strengthen monitoring mechanisms for the enforcement of environmental regulations. In this sense, the soil environmental information platform and monitoring system with regular soil examinations – under the 2019 Soil Pollution Prevention and Control Law – needs to be implemented and can set the stage for similar efforts relating to water use in agriculture. More specifically, in implementing the 2021 regulation on groundwater conservation and protection, a comprehensive review of water governance could better define responsibilities, remove conflicts, and ensure effective policy implementation.
- Public expenditures on general services increased but at a slower pace than support to individual producers, and fail to keep pace with sector growth. More efforts are needed to restructure agricultural support towards public investment in R&D and agricultural infrastructure. Further investments in sanitary inspection and control services will be key for implementation of the revised provisions of the Food Safety Law, the envisaged nation-wide surveillance system for diseases and pests, and the consolidated recovery of the pig meat sector, affected by African swine fever.
- Additional investments in innovation can enhance the current efforts relating to R&D in GHG mitigation in the livestock sector – the primary contributor to agricultural emissions. This restructuring of public expenditure can be achieved by scaling down input subsidies, such as the subsidy to purchase farm machinery, and ensuring that support through direct payments has only a transitory role in backing farmers' adjustment to a new market environment.
- Reforms to land transfer rules have been contributing to the emergence over the past decade of large family farms, co-operative farms, and farms run by agri-business companies. To continue delivering expected outcomes, increased investments in education and training and improved access to financial services need to complement these reforms.

Figure 9.1. China: Development of support to agriculture



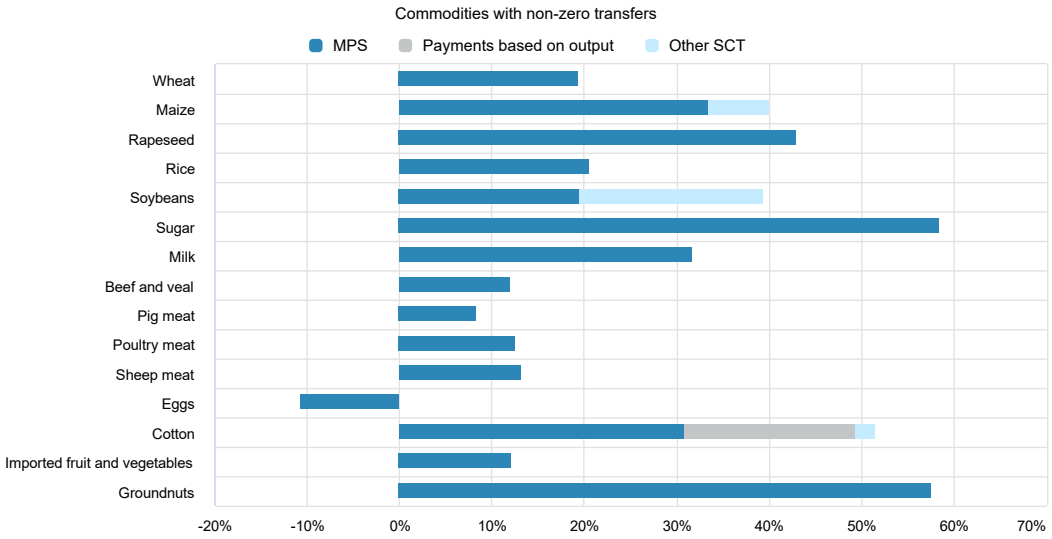
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 9.2. China: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 9.3. China: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 9.1. China: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**270 118**	**1 586 855**	**1 434 460**	**1 622 587**	**1 703 518**
of which: *share of MPS commodities (%)*	75.76	79.75	80.68	76.96	81.61
Total value of consumption (at farm gate)	**281 331**	**1 725 143**	**1 524 752**	**1 778 446**	**1 872 230**
Producer Support Estimate (PSE)	**14 354**	**246 375**	**199 382**	**250 737**	**289 007**
Support based on commodity output	7 329	178 594	138 418	181 956	215 407
Market Price Support[1]	7 329	175 352	136 013	178 420	211 623
Positive Market Price Support	11 162	179 602	137 676	182 979	218 151
Negative Market Price Support	-3 833	-4 250	-1 664	-4 559	-6 528
Payments based on output	0	3 242	2 406	3 536	3 784
Payments based on input use	5 684	19 585	19 244	19 087	20 424
Based on variable input use	1 414	3 956	3 671	3 960	4 238
with input constraints	0	0	0	0	0
Based on fixed capital formation	3 026	13 346	12 920	13 100	14 018
with input constraints	0	0	0	0	0
Based on on-farm services	1 244	2 283	2 653	2 027	2 169
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	533	31 234	26 946	32 249	34 508
Based on Receipts / Income	533	1 854	2 084	1 681	1 799
Based on Area planted / Animal numbers	0	29 380	24 863	30 568	32 710
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	370	15 332	13 092	15 896	17 009
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	370	15 332	13 092	15 896	17 009
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	438	1 629	1 681	1 550	1 658
Based on long-term resource retirement	438	1 629	1 681	1 550	1 658
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**5.18**	**14.83**	**13.31**	**14.79**	**16.23**
Producer NPC (coeff.)	**1.03**	**1.14**	**1.11**	**1.15**	**1.17**
Producer NAC (coeff.)	**1.05**	**1.17**	**1.15**	**1.17**	**1.19**
General Services Support Estimate (GSSE)	**11 861**	**34 242**	**29 530**	**35 360**	**37 837**
Agricultural knowledge and innovation system	1 347	6 564	7 062	6 102	6 530
Inspection and control	349	2 987	2 812	2 970	3 178
Development and maintenance of infrastructure	3 424	10 025	5 169	12 032	12 875
Marketing and promotion	0	517	417	548	586
Cost of public stockholding	6 741	14 149	14 070	13 708	14 669
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**45.03**	**12.22**	**12.90**	**12.36**	**11.58**
Consumer Support Estimate (CSE)	**-8 512**	**-221 196**	**-158 714**	**-241 348**	**-263 527**
Transfers to producers from consumers	-8 688	-197 256	-143 693	-203 054	-245 021
Other transfers from consumers	-1 119	-42 344	-22 079	-56 755	-48 199
Transfers to consumers from taxpayers	128	0	0	0	0
Excess feed cost	1 167	18 404	7 058	18 461	29 693
Percentage CSE (%)	**-3.03**	**-12.79**	**-10.41**	**-13.57**	**-14.08**
Consumer NPC (coeff.)	**1.04**	**1.16**	**1.12**	**1.17**	**1.19**
Consumer NAC (coeff.)	**1.03**	**1.15**	**1.12**	**1.16**	**1.16**
Total Support Estimate (TSE)	**26 343**	**280 617**	**228 911**	**286 097**	**326 844**
Transfers from consumers	9 807	239 600	165 772	259 809	293 220
Transfers from taxpayers	17 655	83 361	85 218	83 042	81 823
Budget revenues	-1 119	-42 344	-22 079	-56 755	-48 199
Percentage TSE (% of GDP)	**1.97**	**1.80**	**1.60**	**1.94**	**1.85**
Total Budgetary Support Estimate (TBSE)	**19 014**	**105 265**	**92 899**	**107 676**	**115 221**
Percentage TBSE (% of GDP)	**1.42**	**0.68**	**0.65**	**0.73**	**0.65**
GDP deflator (2000-02=100)	**100**	**191**	**188**	**189**	**196**
Exchange rate (national currency per USD)	**8.28**	**6.76**	**6.91**	**6.90**	**6.45**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for China are: wheat, maize, rice, rapeseed, soybean, sugar, milk, beef and veal, sheep meat, pig meat, poultry, eggs, cotton, apples, groundnuts, peanuts, exported fruit and vegetables, and imported fruit and vegetables.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

The evolution of China's agricultural policy objectives reflects the changing role of agriculture at different stages of economic development. In the 1950s and 1960s, the agricultural sector was taxed to support the industrial sector's development. In the late 1970s, China initiated an important economic transformation process, implementing reforms towards a market-oriented economy with a direct impact on agriculture (OECD, 2005[1]; OECD, 2018[2]). China implemented its first rural reform, the household responsibility system (HRS), during 1978-84. This dismantled the people's communes and contracted cultivated land to individual households, mostly based on the number of people or labourers in the household.[1]

Until the late 1990s, agricultural policies focused on increasing food production, particularly grains, through the provision of fertiliser and other input subsidies to farmers. At the same time, policy actions targeted deregulation and diversification of marketing channels. Central and local governments allocated increasing support for irrigation.

Liberalisation of international trade started in the early 1990s with relaxation of trade restrictions and allowing private traders to play a role in agricultural commodity markets. In the context of China's WTO accession in 2001, the average import tariff for agricultural products fell from 42% in the early 1990s to 12% in the early 2000s.

In the 2000s, the growing income gap between urban and rural populations, and between developed and underdeveloped rural areas became an important policy issue. Increasing farmers' income was included among the key policy objectives together with food self-sufficiency[2] in several of the *No. 1 Central Documents*[3] during the 2000s. The importance of improving farmers' incomes was reflected in the introduction of minimum purchase prices for grains, the temporary purchasing and storage system, and subsidies for agricultural materials, superior crop varieties, and agricultural insurance premiums.

Moreover, many of the *No. 1 Central Documents* emphasised other policy goals, such as ensuring the quality of agricultural products and food safety, enhancing agricultural competitiveness, and protecting the agricultural ecosystem. In the early 2000s, China introduced agri-environmental payments under programmes such as "Grain for Green" (officially called the *Returning Farmland to Forests Programme*), converting grazing land to grassland, or Grassland Ecological Protection.

In 2014, China further promoted land reforms through the "three rights separation system" into village collective landowner rights, individual household land contract rights, and land operation rights. These aimed to consolidate farm operations and contribute to productivity growth. To control the conversion of farmland for non-agricultural use, a "red line" on arable land was set at no less than 124.3 million hectares in the 2016 *Adjusted Scenario of the Outline of the National Overall Planning on Land Use*.

Reforms to the government-led temporary purchase and storage policy for cotton, soybeans and rapeseed at pre-determined prices were introduced in 2014-15, and 2016 for maize. For cotton, this was replaced by compensation payments covering the difference between pre-determined target prices and actual market prices. For soybeans and maize, it was replaced by direct payments based on area planted. In 2016, China also merged all subsidies on grain, seed and aggregate inputs into a single general income support payment. While wheat and rice remained subject to the minimum price procurement programme, support prices were gradually reduced between 2015 and 2019. In 2020, during the COVID-19 pandemic, the minimum support price was increased again for indica rice.

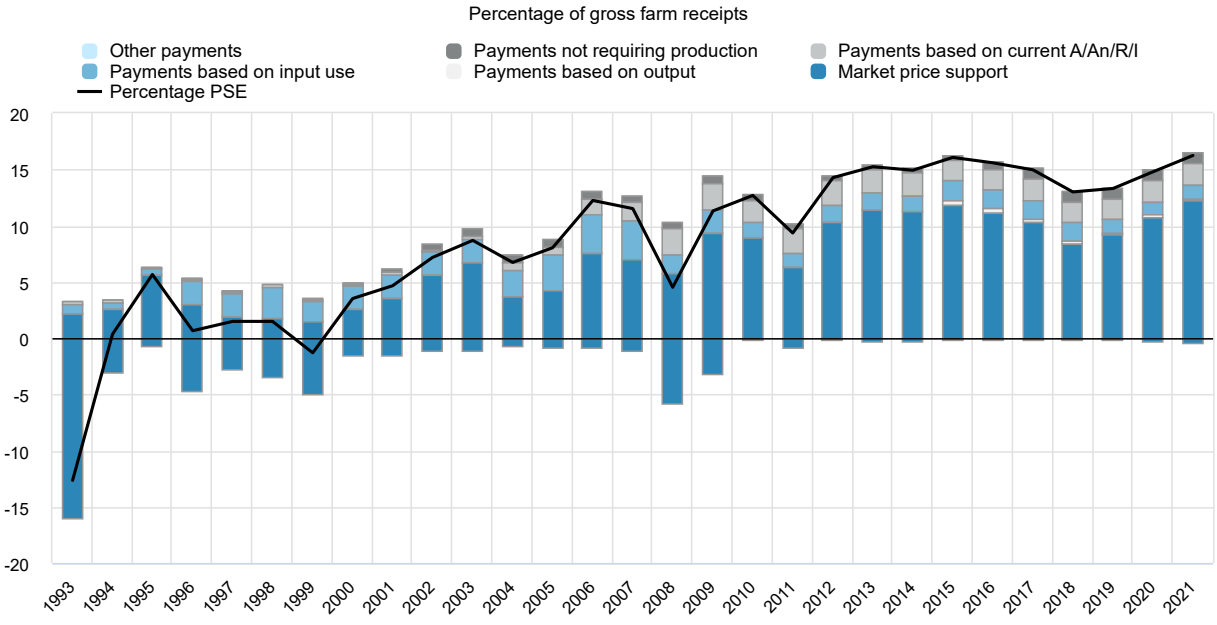
In 2017, China introduced a rural revitalisation strategy to close the urban-rural development gap. The rural revitalisation strategy foresees support to general services to increasingly contribute to the development of agro-food supply chains.

Table 9.2. China: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1978	Centrally planned economy	Centralised control of agricultural activities Collective and commune-farmer land systems Production, marketing and price controls, implicitly taxing agriculture Investments in irrigation systems and extension services State agricultural trading firms and high tariffs
1978-1999	Initial reforms to the centrally planned economy	Collective and commune land system dismantled, household responsibility system set up for land use Some deregulation of agricultural marketing State Grain Authority ensuring food availability and affordability to the population Public stockholding, food price subsidies to urban consumers Fertiliser and input subsidies
2000-2009	Improving farmers' incomes and food self-sufficiency key policy objectives Further trade liberalisation	Increase in spending on agricultural research and development Technical assistance services Input subsidies, implicit credit subsidies Increasing allocations to the "Grain for Green" conservation programme Input and output markets increasingly allowing participation of private traders WTO accession in 2001, free trade agreements signed, reduction of tariffs Minimum purchase price system for grains Temporary purchase and storage policy established for selected commodities
2010-2014	Increasing support to agriculture	Increasing minimum purchase prices, and larger set of commodities covered by the temporary purchase and storage system Agricultural insurance premium subsidies
Since 2014	Policy efforts to adjust the price support system and respond to agricultural productivity and sustainability challenges	Continued reforms in land transfer rules National Agricultural Sustainable Development Plan 2015-2030 Agricultural support and protection subsidy payments per area since 2015 (currently "Agricultural Production Development" programme) 2017 National strategy on "rural revitalisation" Dismantling of price support systems for cotton, soybeans, rapeseed, maize; introduction of direct payments based on area Gradual decrease in support prices for wheat and rice during 2015-19; increases since the COVID-19 pandemic in support prices for indica rice and wheat

At the end of the 1990s, China's support to the agricultural sector mostly comprised budgetary allocations while market price support (MPS) was negative. Budgetary allocations went to input subsidies and general services to the sector. However, since 2002, MPS increased and became the main instrument to support agricultural producers. After 2009, China continued to increase its minimum support prices, leading to significant price gaps between domestic and international markets. Support to farmers increased until 2015, when reforms to commodities such as rapeseed, soybeans, cotton and maize contributed to lowering MPS. Since 2020, MPS has been increasing particularly for imported grains and oilseeds, against a backdrop of higher domestic and reference prices. This has led to higher overall support to agricultural producers in 2020-21, following a period of gradual decrease during 2016-19. MPS accounts for more than two-thirds of PSE, followed by budgetary support for payments based on current area and input subsidies (Figure 9.4).

Figure 9.4. China: Level and PSE composition by support categories, 1993 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Market price support is the main channel for providing support to Chinese farmers. It is provided through both domestic price policies, such as the minimum purchase prices for wheat and rice, and trade policies, including tariffs, tariff rate quotas (TRQs) and state trading.

The minimum purchase prices for wheat and rice are set every year by the National Development and Reform Commission (NDRC) in consultation with the Ministry of Agriculture and Rural Affairs (MARA), and other government institutions. Their application is limited to major wheat and rice producing provinces. The minimum purchase prices for wheat and rice are announced before sowing seasons, and only apply for several months after the harvest. The central government mandates that state-owned China Grain Reserves Corporation (Sinograin) and other state-owned companies undertake intervention purchases in case market prices fall below respective minimum prices. Only grain of national grade 3 or higher[4] can be purchased at minimum prices since 2018. However, in situations with large volumes of grain below grade 3, such as in cases of extreme weather events, provincial authorities can also purchase these under temporary reserves. Minimum price procurement can begin only when the market price has fallen below the minimum price for three consecutive days, and must be suspended when the market price rises above the minimum for three consecutive days. Ceilings on the volumes of grains procured at minimum purchase prices during a marketing year have been set at 37 million tonnes for wheat (since 2019) and at 50 million tonnes for rice (since 2020).

Budgetary transfers to specific commodities include compensatory and direct payments. Compensation payments cover the difference between pre-determined target prices and actual market prices for cotton

producers, and are a combination of output payments and area payments. Direct payments based on area planted are provided for soybeans and maize producers.

Other key budgetary programmes include: the "Agricultural Production Development" subsidy[5] paid on per unit of land basis, combining direct payments for grain producers, subsidies for agricultural inputs, and subsidies for improved seed variety; subsidies for purchases of agricultural machinery; subsidies for land consolidation; subsidies for farmland irrigation construction; subsidies for agricultural insurance schemes; subsidies for returning farmland to forests and excluding degraded grassland from grazing.

Public stockholding of grains and programmes supporting the development of agricultural infrastructure (including irrigation and drainage facilities) represent the most important categories of general services. Expenditures related to agricultural knowledge and innovation are also sizable.

The *National Agricultural Sustainable Development Plan* 2015-2030 sets the goals and pathways in terms of natural resources protection and farming practices that are protective of the environment. It also includes a focus on production quality and efficiency. In this sense, the plan sets priorities for different zones by taking into account their capacity for agricultural production, resource endowments, and ecological characteristics (Ministry of Agriculture and Rural Affairs, 2015[3]). Moreover, 220 high-standard dry-farming and water-saving agricultural demonstration areas have been established in dry farming areas in North and North-west China, to demonstrate and promote technologies such as: water storage and soil moisture conservation; rainwater harvesting and supplementary irrigation; ridge tillage and furrow irrigation; soil-moisture based on-demand irrigation; water-saving irrigation; water and fertiliser integration, and drought and stress resistance; and water resource efficiency.

Climate change mitigation policies in agriculture

Primary agriculture is responsible for 6.7% of China's gross GHG emissions, slightly lower than the OECD average. Most agricultural emissions originate in livestock farming (42.8%), followed by emissions from agricultural soils (34.1%) and rice planting (22.1%).

China ratified the Paris Agreement on Climate Change on 3 September 2016. Its NDC, submitted in 2016 and updated in 2021, explicitly mentions agriculture, land-use change and forestry, among other sectors, but no specific net-emission target has yet been set for the agricultural sector. The commitments covered by the updated NDC are economy-wide and acknowledge the role of agriculture in achieving these: to peak CO_2 emissions by 2030 and carbon neutrality by 2060; to lower the carbon intensity of GDP 65% below 2005 levels by 2030; to increase the share of non-fossil fuels to around 25% of primary energy consumption; to increase forest stock volume 6 billion m^3 from the 2005 level; and to bring total installed capacity of wind and solar power to over 1.2 billion kW by 2030 (State Council, 2021[4]).

The only specific quantitative target set in the NDC for agriculture relates to achieving zero growth in fertiliser and pesticide utilisation by 2020, which MARA reported as achieved in 2018. Other broad objectives in the NDC concern controlling methane emissions from rice fields and nitrous oxide emissions from farmland, promoting comprehensive utilisation of straw, or reutilisation of agricultural waste (UNFCC, 2021[5]; Climate Action Tracker, 2021[6]).

In 2016, the State Council released the 13th Five-Year Work Plan to Control GHG Emissions, looking to strengthen policies controlling GHG emissions besides CO_2, such as methane and hydrofluorocarbons (HFCs). The plan included targets for the agriculture and land use, land-use change and forestry (LULUCF) sectors. It aimed to reduce CH_4 emissions from the agricultural sector, although a quantitative emissions reduction target was not specified. It also aimed to modernise agricultural production to reduce over-utilisation of land and convert 1 million hectares of marginal cropland into forest or grassland. Targets set for the LULUCF sector included an increase in forest coverage to 23% by 2020, stable arable land at 124.3 million hectares by 2020, and grassland vegetation coverage of 56% by 2020 (NDRC, 2017[7]).

Demonstrations of fertiliser reduction and efficiency enhancement were carried out in 300 counties across China, including fertiliser-saving technologies such as deep placement of fertilisers.[6] In 2021, 75% of livestock and poultry manure was treated and turned into either fertiliser or gas (Ministry of Ecology and Environment, 2021[8]).

Two action plans support agricultural biogas development in China. The Agricultural Biogas Development Plan 2017 aims at reducing China's GHG emissions 46 $MtCO_2eq$ by 2020 by increasing agricultural biogas and digestate fertiliser production. The Bioenergy Development component of the 13th Five Year Plan supports biogas production by establishing 160 demonstration counties by 2020, more specifically to increase solid digestate fertiliser consumption to 10 million tonnes, liquid digestate fertiliser consumption to 50 million tonnes, straw utilisation to 83% and livestock waste utilisation to 70%. The Plan also targets a 10% reduction in ammonia nitrogen pollution (Ministry of Ecology and Environment, 2019[9]).

Several forestry programmes, primarily involving increased afforestation and improved forest management, support NDC objectives of increasing the forest stock volume and GHG emission reductions in the LULUCF sector. The Grain for Green programme, implemented since 2000, uses direct payments to incentivise farmers to re-establish forest and shrub vegetation on sloped cultivated land at risk of erosion. It aims to afforest large tracts of barren land. The programme is estimated to have achieved 29 million hectares of afforestation, including converting 9 million hectares of cropland to forestland. The Forest Management Plan 2016-2050 also includes guidelines for forestry maintenance and restoration, for the development of forest management plans at provincial and county levels, and for piloting sustainable forest management programmes.

Research initiatives support GHG mitigation in China's agricultural sector. In 2018, China launched several research projects on GHG emissions mitigation from livestock as part of a research collaboration between Chinese agencies: the Research Program on Climate Change, Agriculture and Food Security (CCAFS); the Sino-Dutch Dairy Development Centre (SDDDC); Wageningen University & Research, Global Research Alliance (GRA); and with the private sector. The objectives include identifying sustainable dairy farming practices, especially from novel feeds (such as lignin degradation of maize or rice straw), and providing accurate estimates of emission reductions from these changes in dairy farming practices.

In September 2021, China released the 14th Five-Year National Agriculture Green Development Plan 2021-25, issued jointly by MARA, the NDRC, the Ministry of Science and Technology (MOST), the Ministry of Natural Resources (MONR), the Ministry of Ecology and Environment (MEE), and the State Forestry and Grassland Administration (SFGA) (State Council, 2021[10]). Policy objectives and areas for action include:

- Reduce usage of fertilisers and pesticides and increase application efficiencies.
- Build a green and low-carbon agricultural industry supply chain to improve agricultural production quality, efficiency and competitiveness by: setting up 800 green standardised agricultural product production bases, 500 standardised demonstration farms for livestock and poultry, and creating more than 1 800 agricultural brands; formulating and revising 1 000 industrial standards related to agricultural green production; supporting green, organic, and geographical indication certification of agricultural products (certified products should reach over 60 000 and the number of production enterprises should reach 27 000).
- Carry out research and apply agricultural green production technologies such as soil improvements, waste recycling, and green processing; and research and develop green inputs such as efficient and biological fertilisers, soil conditioners, high-efficiency, low-toxicity and low-residue agricultural and veterinary drugs, feed additives, and degradable mulching films.
- Improve compensation mechanisms for ecological protection and establish a price mechanism for green products.

Domestic policy developments in 2021-22

In March 2021, the Central Committee of the Communist Party of China (CCCPC) released the *14th Five-Year Plan 2021-25 for National Economic and Social Development*. The plan outlines specific key priorities in the area of agriculture modernisation: enhancing food security, including by safeguarding a minimum arable land area of 120 million hectares; maintaining subsidies for grain producers and increasing minimum purchase prices for wheat and rice as appropriate; implementing high-standard infrastructure and conservation projects, which could also advance the development of green agriculture; investing in innovative farm technologies and smart agriculture[7] systems, including with respect to seeds and animal breeding; and improving pest and disease control systems (Cheng and Shi, 2022[11]). In addition, regarding the acceleration of the "rural revitalisation" strategy, the plan foresees increased investments in rural infrastructure and financial services, agro-food supply chains and agri-businesses, further rural land reforms, and diversification of income generation activities, such as through rural eco-tourism. The plan also promotes the "dual circulation" strategy at an economy-wide level, increasing the emphasis on the domestic market relative to export development.[8]

In November 2021, the State Council issued the *14th Five-Year Plan for Promoting Agricultural and Rural Modernization 2021-25* setting the mid-term objective of an annual production of grains at minimum 650 million tonnes and of meat at 89 million tonnes, baselines set to maintain food security (State Council, 2021[12]). The Plan also emphasises consolidating the achievements of poverty reduction in rural areas, supporting agricultural innovation and seed development, and conducting new surveys on agricultural production costs to target agricultural insurance programmes and subsidies.

China released its *No. 1 Central Document* for 2022 on 22 February 2022, calling for a continuous and comprehensive promotion of rural revitalisation. The No. 1 Central Document reinforces the objective for an annual production of grains at 650 million tonnes. In addition, it emphasises e-commerce, tourism and logistics for the development of rural areas. The No. 1 Document also promotes the increase of soybeans and other oilseeds production capacity, through better targeted subsidies for oilseed-producing counties, conversion of rice cropland to soybeans in parts of the Heilongjiang province, intercropping of soybeans with maize in alternating rows, as well as planting rapeseed on fallow land in the Yangtze River valley and soybeans on saline soil (State Council, 2022[13]).

Following the minimum purchase price increases in 2019-20, the NDRC raised in February 2021 the minimum purchase prices for indica rice and wheat by 1%. In October 2021, the NDRC increased the minimum purchase price for wheat for procurement in 2022 by 1.8%. In February 2022, minimum purchase prices were increased for early indica by 1.8% and for late indica rice and japonica rice by 0.8%.

Against the backdrop of increasing industry demand and domestic prices for cotton, auctions were held during October and November 2021 for cotton from state reserves. The daily volume for auctions was established at 15 000 tonnes and the starting purchase price set as the average of the domestic market spot price index and the international market spot price index (CnCotton, 2021[14]).

In June 2021, MARA provided an additional CNY 20 billion (USD 3.2 billion) subsidy to grain farmers in order to offset increasing input costs. The subsidy was incorporated into the programme of Agricultural Production Development (paid per unit of land). At least 25% of the subsidy would be provided by provincial governments; in selected provinces in the centre, western and north-eastern regions, at least 45% of the subsidy would be provided by provincial governments (Ministry of Agriculture, 2021[15]). In March 2022, this policy was extended for another year and thus an additional CNY 20 billion (USD 3.2 billion) subsidy will be allocated in 2022 to grain farmers in order to offset continued rising input costs.

In September 2021, MARA introduced the *Interim Implementation Plan to Manage Swine Production Capacity*. The plan requires for the national sow inventory to be maintained at approximately 41 million animal heads per year during 2021-25. The inventory cannot be lower than 37 million animal heads (i.e. 90% of the target). The plan provides targets for each province's sow inventory; if a province's sow

inventory fluctuates above or below 5% of its target, the central government can introduce measures such as the culling of inefficient sows and provide subsidies to restore the sow inventory (Ministry of Agriculture, 2021[16]).

In December 2021, MARA also released the *14th Five-Year Plan for the Development of the Livestock Sector*. The plan reiterates the self-sufficiency rates set by the State Council in 2020,[9] namely: 95% for pig meat production; 85% for beef and sheep meat; 70% for milk; 100% for poultry and eggs (Ministry of Agriculture and Rural Affairs, 2021[17]). The plan focuses on scaling up farms, becoming self-sufficient in producing breeding stock, stabilising supply, preventing disease, reducing the industry's environmental footprint, filling a shortfall in fodder for ruminants, and enhancing supply chains between farmers and downstream processors.

In April 2021, MARA released new guidelines to reduce the amount of maize and soymeal used in pig meal and chicken feed. Alternative crop sources were proposed to substitute maize feed (e.g. wheat, sorghum, barley, rice and cassava) and soymeal (e.g. rapeseed meal, cottonseed meal, peanut meal, sunflower meal, distillers dried grains, palm meal, flax meal, sesame meal and other maize processing by-products).

In November 2021, MARA published a draft document proposing regulatory changes in the approval procedures applying to genetically modified (GM) maize crops and seeds. The regulations could facilitate the commercial cultivation of GM maize in China (AMIS, 2021[18]).

The *Law of the People's Republic of China on Food Waste* entered into force in April 2021. The law covers a wide range of stakeholders in the agricultural sector, transport, processing, catering as well as individuals in implementing anti-food waste measures. Moreover, national food and strategic reserves authorities have to also reduce losses in grain transportation and storage (National People's Congress, 2021[19]).

A new regulation on groundwater use entered into force in December 2021. The regulation sets out specific rules for the use, conservation and protection of groundwater with the objective to enhance groundwater supervision and management. The regulation designates areas where the exploitation of groundwater is prohibited and entitles provincial-level authorities to address over-exploitation and pollution.

Trade policy developments in 2021-22

The *Regulations on the Registration and Administration of Overseas Producers of Imported Food* (General Administration of Customs China, GACC - Decree 248) entered into force on 1 January 2022. The regulations require that all foreign food manufacturers, processors and storage facilities to be registered with Chinese authorities in order to export agro-food products to China. The regulation sets out two registration pathways for facilities that produce goods within its scope – registration by a competent authority located in the exporting country for 18 product categories[10] defined by GACC or self-registration for others (i.e. all other food products except food additives). Either the GACC facility registration number or the facility registration number issued by the competent authority in the exporting country must be printed on the inner and outer packaging of products produced starting 1 January 2022.

Starting October 2021, the GACC introduced new customs regulations requiring additional inspections of fertiliser exports.[11] The new inspection requirements cover 29 categories of fertilisers (General Administration of Customs of China, 2021[20]).

China applied to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in September 2021. China currently has bilateral or regional free trade agreements with eight CPTPP members (including the Regional Comprehensive Economic Partnership, RCEP[12], which entered into force on 1 January 2022). In those agreements, most tariffs on agricultural products have been eliminated or are close to elimination. An accession to the CPTPP could mainly benefit China's agricultural

trade with Canada and Mexico, as both of these partners do not yet have a bilateral trade agreement or take part in a regional trade agreement with China (GAIN CH2021-0161, 2021[21])

In July 2021, GACC published Announcement No. 50 on the *Implementation of a Notification and Commitment System on Certification Items of the Testing Report for Imported Dairy Products*. The notification and commitment system allows importers (or Customs brokers) to provide a letter of commitment to clear Customs, instead of the original testing report, for first-time dairy imports. Importers (or Customs brokers) may also continue to submit the original testing report for customs clearance.

Starting January 2022, the tariffs for pig meat and pig meat products are raised from 8% to 12%. Tariffs for orange juice are raised from 15% to 18%. Tariffs on whole or broken cocoa beans are eliminated (Ministry of Finance, 2021[22]).

In January 2022, the State Council issued the first five-year plan on the protection and utilisation of Geographical Indications (GIs) (State Council, 2022[23]). The objectives of the plan are to: improve the foundation for establishing and protecting GIs; improve the utilisation, branding, and marketing of GIs; and expand the mutual recognition and protection of GIs. The plan promotes the implementation of the China – European Union Agreement on Protecting GIs as well as the negotiation of international mutual recognition and mutual protection of GIs with more countries.

On 24 February 2022, the GACC approved imports of wheat from all regions of the Russian Federation, following an initial agreement reached on 8 February 2022. Imports of wheat were not previously allowed due to concerns regarding possible fungus and other contamination. The protocol approving imports underscores the importance of adequate pest monitoring in production areas, grain transportation and storage sites; the need for prevention, inspection and control measures; appropriate information exchange and notification on disease surveillance and risk assessments; and delivery of phytosanitary certification (World-Grain, 2022[24]).

Trade policy responses to the COVID-19 pandemic

Identification of traces of SARS-CoV-2 in the autumn of 2021 on dragon fruit imported from Viet Nam and longan fruit imported from Thailand led to temporary shutdowns of selected supermarkets and tighter screening and controls at produce markets selling these fruits in China. This also led to suspending dragon fruit imports from Viet Nam one week in September 2021 in addition to reinforced border controls and quarantine measures at land border crossings over the past months (SCMP, 2022[25]).

Contextual information

China has the world's largest population and the second largest land area. It is an upper-middle income economy, with a GDP per capita – adjusted by PPP – close to 82.7% of the average of countries covered by this report (Table 9.3). However, while counting almost 20% of the world's population, it has only 7% of the world's potable water and 10% of the world's agricultural land. China is thus a resource scarce country, which results in severe competition between agriculture and other users of land and water resources.

Agriculture accounts for 24.7% of employment, but its 8% share of GDP indicates that labour productivity is significantly lower than in the rest of the economy. Even if rural incomes are growing at high rates, they remain at around one-third of those in urban areas.

Crop production represents 64% of total agricultural output and its composition has changed significantly over the last decades, driven by the shift towards higher value-added agricultural products such as fruit and vegetables. While the average farm size remains less than one hectare, large-scale production has been developing rapidly, including among co-operative and corporate farms. North and northeast provinces have seen more rapid farm consolidation than other regions, as increased labour mobility and

the transfer of land among farmers over the past three decades have led to adjustments in the farm structure. Livestock production originates mostly from larger-scale commercial units (OECD, 2018[2]).

Table 9.3. China: Contextual indicators

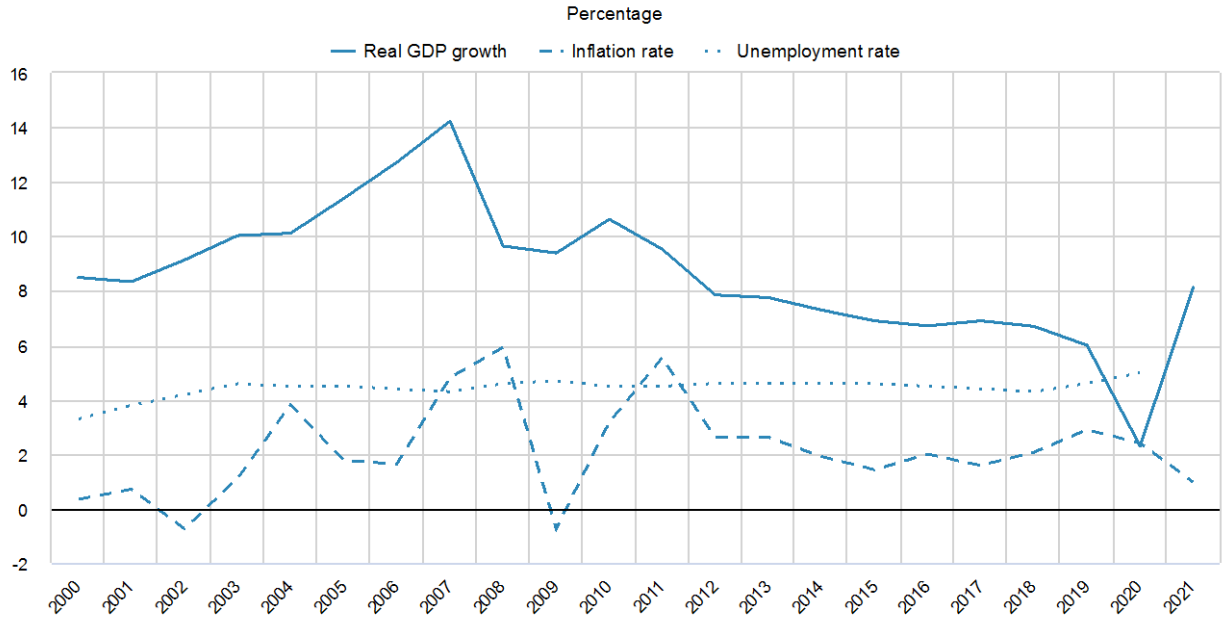
	China		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	3 688	24 273	9.2%	22.2%
Population (million)	1,291	1,439	30.0%	27.6%
Land area (thousand km²)	9 425	9 425	11.5%	11.4%
Agricultural area (AA) (thousand ha)	523 731	528 509	17.4%	18.0%
			All countries[1]	
Population density (inhabitants/km²)	138	153	53	63
GDP per capita (USD in PPPs)	2 921	17 312	9 281	20 929
Trade as % of GDP	19	15	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	14.9	8.0	2.9	4.9
Agriculture share in employment (%)	50.0	24.7	-	-
Agro-food exports (% of total exports)	4.8	2.2	6.2	8.5
Agro-food imports (% of total imports)	4.7	8.2	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	65	64	-	-
Livestock in total agricultural production (%)	35	36	-	-
Share of arable land in AA (%)	23	23	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Real GDP growth averaged 5.4% in 2019-21 (Figure 9.5). China experienced one of the strongest economic growth rates among G20 economies since the COVID-19 crisis, supported by strong industrial activity and a boost in exports in 2021 against a backdrop of increasing demand in other major economies. This followed a period of gradual slowdown in economic growth since 2012. Unemployment only slightly increased in 2020, as the economy was supported by the COVID-19 fiscal support policies. Following an inflation higher than 2% in 2019-20, when food inflation was driven by higher pig meat prices due to the African swine fever outbreak and related supply constraints, this decreased at 1% in 2021.

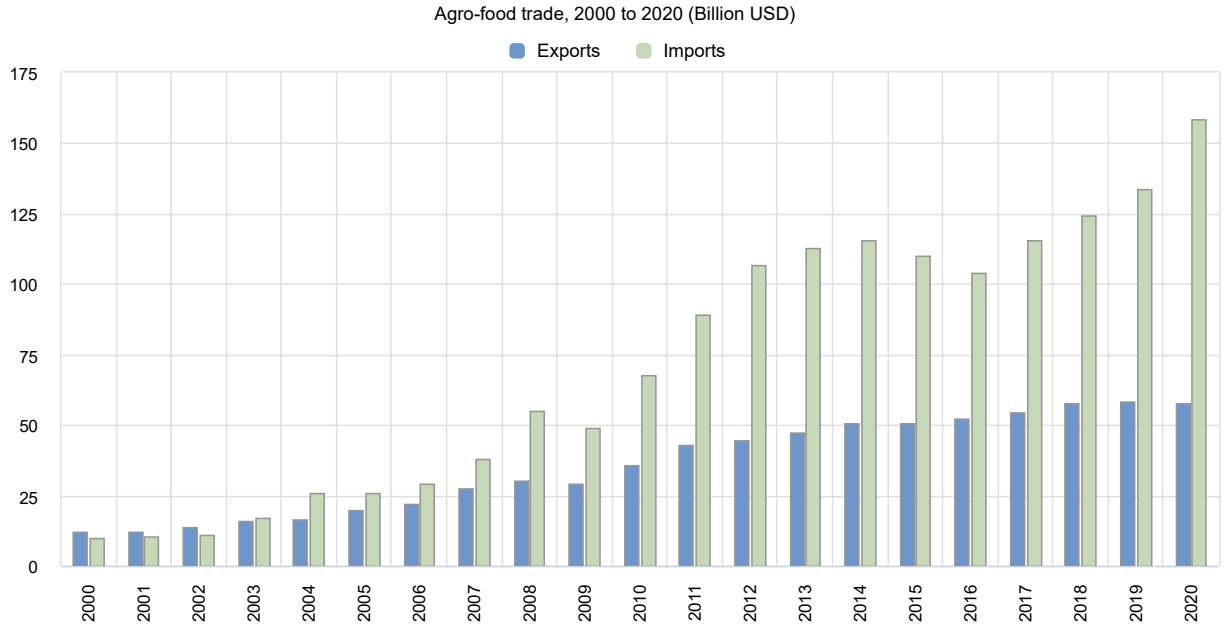
China has consistently been a net agro-food importer since 2003, but agro-food exports have been growing over the last two decades. While agro-food exports stabilised since 2018, agro-food imports have been increasing at a higher rate during this period. The significant increase in agro-food imports since 2020 has been driven by higher imports of grains and oilseeds, particularly maize and soybeans. Primary products used as inputs in the domestic food industry dominate China's agro-food imports, representing 39% of the total in 2020. In turn, primary and processed products for final consumption are key export categories, accounting for 71% of total agro-food exports (Figure 9.6).

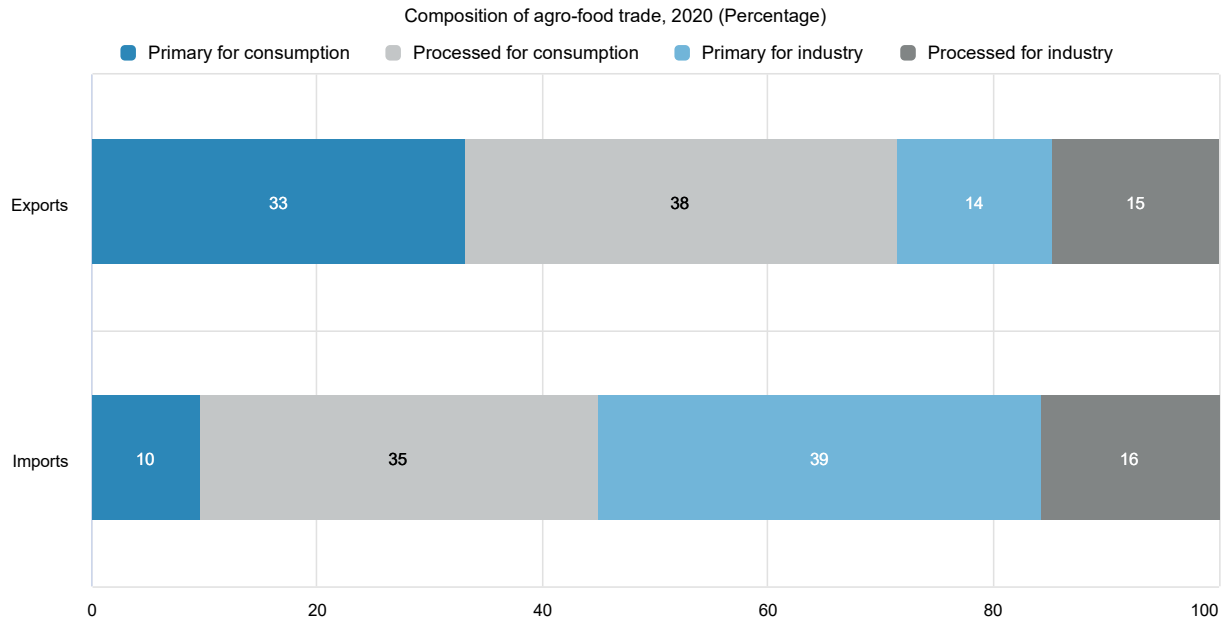
Figure 9.5. China: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 9.6. China: Agro-food trade



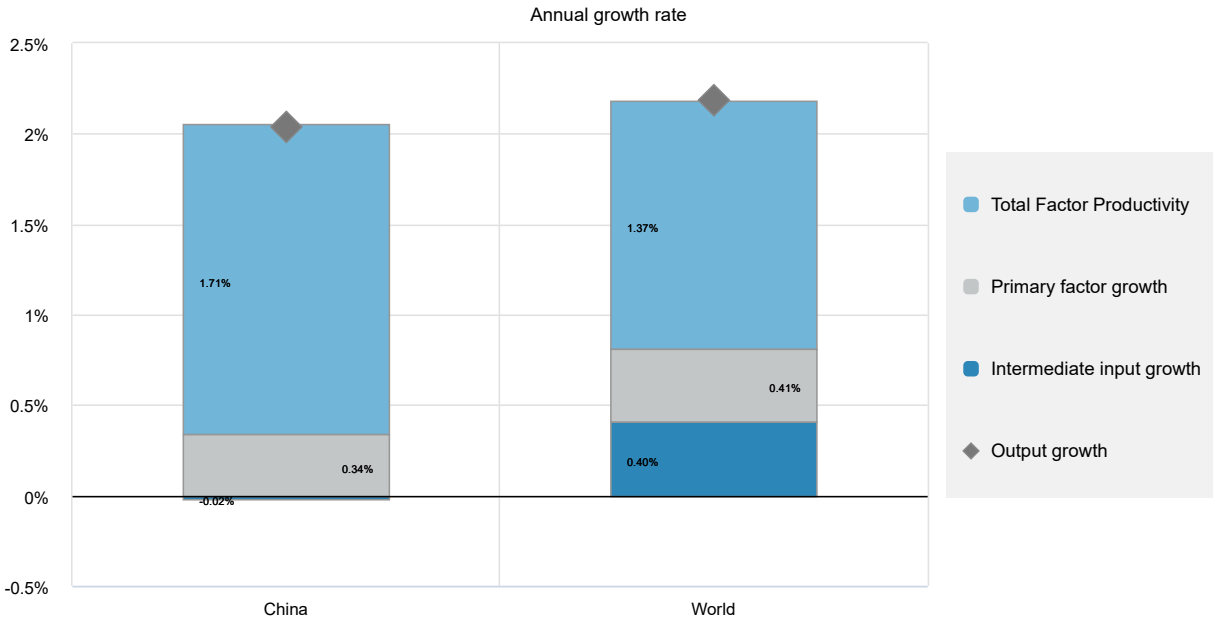


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Agricultural output growth in China averaged 2% in 2010-19, on par with the world average (Figure 9.7). This has been driven by growth in total factor productivity (TFP) of 1.7% per year, higher than the global average and largely attributed to farm consolidation and increased mechanisation of production.

The contribution of primary factor growth to agricultural output growth (0.3%) is also on par with the world average (0.4%). The sustained growth in agricultural output is exerting pressures on natural resources such as land and water. While nutrient surplus intensities for nitrogen and phosphorus have been declining over the past two decades, these remain at high levels, particularly for phosphorus relative to the OECD average (Table 9.4). Agriculture remains the key user of water, accounting for 61.2% of total water consumption, well above the OECD average. Water stress is more than twice as high as the OECD average.

Figure 9.7. China: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 9.4. China: Productivity and environmental indicators

	China		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	4.0%	1.7%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	41.4	31.3	32.1	30.0
Phosphorus balance, kg/ha	9.8	9.5	3.4	2.9
Agriculture share of total energy use (%)	2.4	2.2	1.7	2.0
Agriculture share of GHG emissions (%)	9.8	6.7	8.6	9.7
Share of irrigated land in AA (%)	10.3	13.1	-	-
Share of agriculture in water abstractions (%)	68.8	62.1	46.3	43.7
Water stress indicator	19.3	20.7	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Although ownership of land remained collective, control and income rights belonged to individuals under the HRS, with a land contract term of 15 years. When this ended in the late 1990s, the second term was extended to 30 years.

[2] Interpreted to mean that China should produce 95% of its own grain requirements. The Chinese self-sufficiency rate for grains is defined as the total production of wheat, coarse grains and rice divided by total domestic consumption of these crops (OECD, 2005[1]).

[3] The No. 1 Central Document is the most important policy document in China, issued jointly by the Central Committee of the Communist Party of China (CCCPC) and the State Council. This document determines the most important policy issues and focus of the year. Issues related to agriculture, farmers and rural areas have consistently been selected as the topic of this document since 2004.

[4] The quality grade standard is divided into five grades plus a 'sub-standard' category.

[5] Initially called "agricultural support and protection subsidy".

[6] This method ensures better distribution of fertiliser in the root zone soil and prevents loss of nutrients by run-off.

[7] This focuses on providing the agricultural industry with the infrastructure to leverage advanced technology – including big data and the Internet of Things (IoT) – for tracking, monitoring, automating, and analysing farm operations.

[8] The strategy of "dual circulation" was introduced in May 2020, placing an increased emphasis on the domestic market (or "internal circulation") while gradually decreasing reliance on an export-oriented development model (or "external circulation").

[9] State Council 2020 *Opinion on Promoting the High-quality Development of the Livestock Industry*.

[10] The 18 product categories defined by GACC are: meat and meat products; sausage casings; aquatic products; dairy products; bird nests and bird nest products; bee products; eggs and egg products; edible oils (and fats) and oilseeds; stuffed wheaten products; edible grains; milled grain industry products and malt; fresh and dehydrated vegetables and dried beans; condiments; nuts and seeds; dried fruits; unroasted coffee beans and cocoa beans; foods for special dietary purposes; health foods.

[11] China accounts for approximately 30% of global trade in fertilisers.

[12] RCEP comprises the ten economies that make up the Association of South East Asian Nations (ASEAN), Australia, China, India, Japan, Korea and New Zealand.

10 Colombia

Support to agriculture

Agricultural producer support in Colombia averaged 10% of gross farm receipts during 2019-21, down from 24% in the early 2000s. The producer support estimate (PSE) continues to be dominated by market price support (MPS), which accounts for almost 90% of these transfers. MPS for a range of agricultural products is driven by border measures, such as tariffs. Consequently, support to individual commodities (SCT) is particularly high for rice, maize, milk, pig meat and poultry. On average, prices received by farmers were 10% higher in 2019-21 than those observed in world markets.

Budgetary transfers to farmers accounted for the remaining 10% of PSE in 2019-21, mostly based on variable input use such as credit support through preferential interest rates, and subsidies for purchases of machinery and equipment, fertiliser and seeds.

Budgetary allocations to general services for the sector (GSSE) were small, corresponding to 1.4% of the value of agricultural production on average. Support for general services focuses on agricultural research and knowledge transfer; infrastructure, particularly in irrigation; and farm restructuring (e.g. land formalisation, rights and access). Overall, total support to the sector (TSE) corresponded to 1.1% of GDP.

Recent policy changes

Total public expenditures allocated to the agricultural sector increased substantially in 2021 (66% relative to 2020). Programmes with increased funding focused on production management, improving sanitary status, climate initiatives, institutional capacity, and innovation and development. During 2018-22, about 50 000 land titles have been issued, formalising around 1 319 000 hectares, benefitting 58 987 families. During this period, 3 567 land properties, or 62 089 hectares, were returned to their rightful owners.

To mitigate domestic price increases caused by the pandemic, the agriculture input law was approved in December 2021, setting tariffs on agriculture inputs at 0%. Moreover, Colombia suspended the Andean Price Band System (SAFP) for some products, and established a fixed tariff for rice (80%), milk powder (98%), white corn (40%), whey (94%), wheat (0%) until June 2022. In March 2022, with the 307 Decree, Colombia reduced to 0% for six months the import tariffs on 163 products that are part of the basic household basket, and for malt and roasted malt, thereby suspending the application SAFP for those products those products during the same period. Moreover, in April 2022, a new Decree (No. 504) reduced to 0% for twelve months the import tariffs on 39 additional agricultural input products, and for six months on another 36 products.

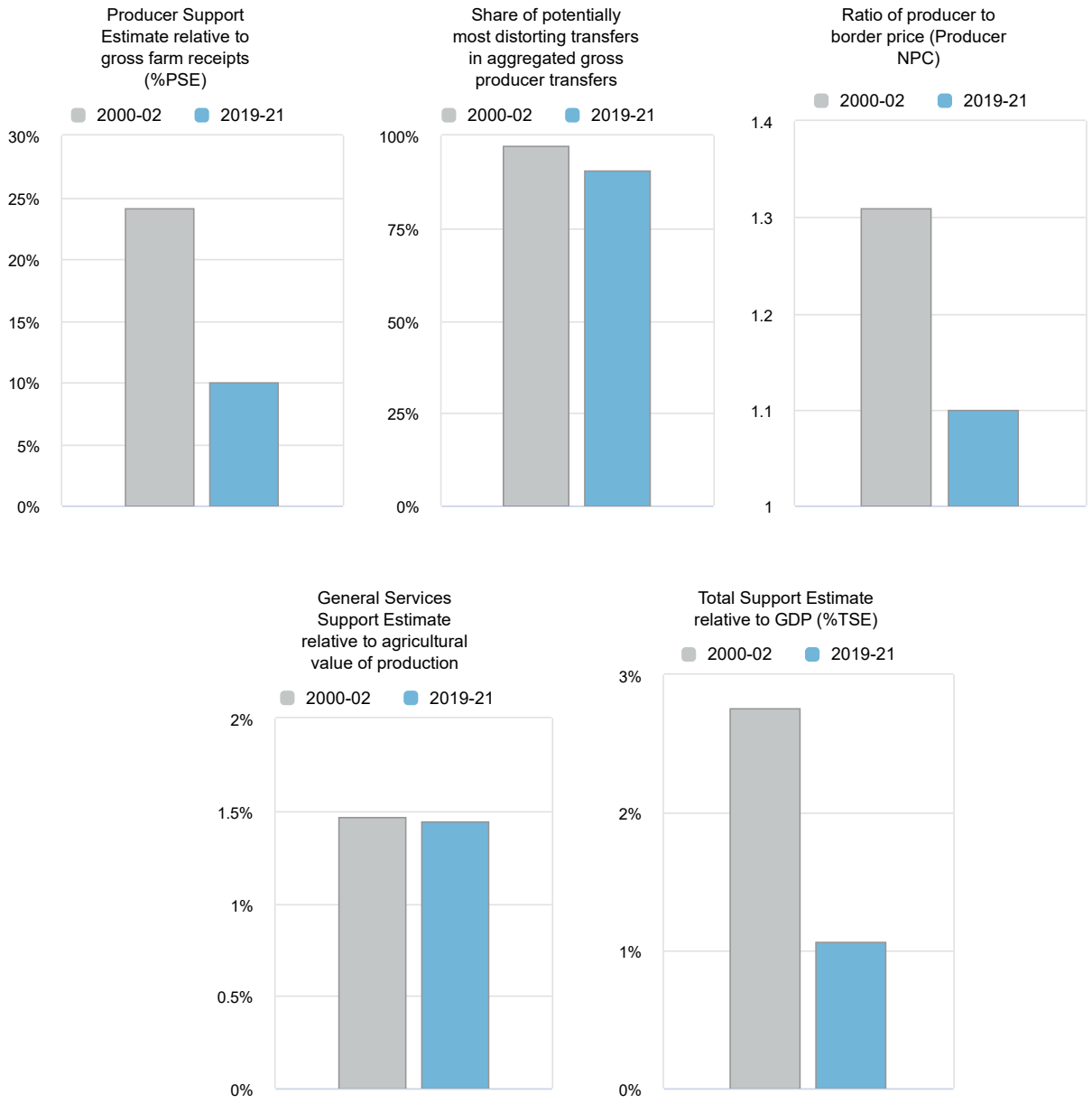
Assessment and recommendations

- Colombia's Nationally Determined Contribution (NDC) committed to reduce its greenhouse gas (GHG) emissions 51% with respect to the baseline scenario by 2030, and black carbon emissions 40% compared to 2014 levels in 2030, with the long-term objective of being carbon-neutral by

2050. Colombia is also a participant to the Global Methane Pledge. Given agriculture's role as a major contributor to the country's GHG emissions, it is likely to be significantly impacted by this commitment even though specific emission reduction targets for the sector have not been set. Moreover, the sustainability performance of the sector, including biodiversity, water use, and deforestation, is a key concern the country needs to address more systematically.

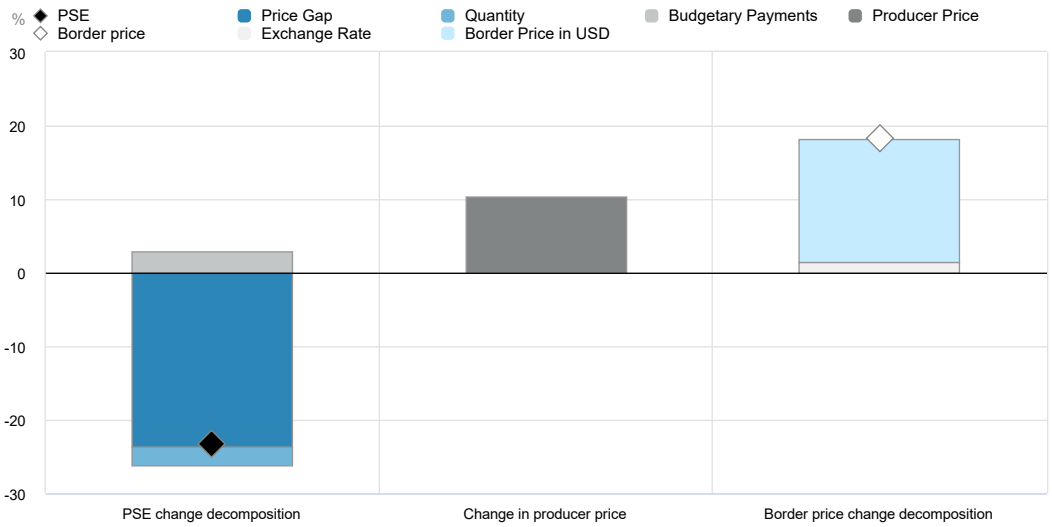
- Colombia's agricultural sector continues to face structural challenges, and support to general services that would help overcome these challenges is limited. Short-term responses to problems faced by agricultural producers, mainly in the form of input subsidies, divert scarce resources from developing an enabling environment to facilitate the sector's sustainable growth.
- Emphasis should be on strategic investments such as improved hydrological infrastructure for irrigation; transport infrastructure; research, development, and innovation capacity; animal and plant health protection and control services; promotion of sustainable use of natural resources; and national and functional extension, training and technical assistance systems that foster technology adoption. Public investment in these areas should contribute to improving productivity and competitiveness, and ensure the sector's sustainable development. The country has made some efforts under the framework of the Peace Agreement on the provision of rural public goods and services, such as irrigation-drainage plan and the technical assistance plan. However, further re-orientation of support from input subsidies to general services can foster more inclusive and sustainable agricultural growth.
- Colombia faces highly concentrated land ownership and under-exploitation of arable land, while 52.7% of land ownership continues to be informal. An inclusive land-access policy framework would promote rural and sectoral development. Ongoing efforts in implementing the multi-purpose cadastre policy should continue and speed up. Upgrading the cadastre system and accelerating registration and assignation of land rights are crucial for the sector. Land rights contribute to long-term growth in the agricultural sector by stimulating private investment, and help promote the development of rural areas.
- The government should assess the impact of existing policy instruments and agricultural support programmes. Current programmes cover broad and varied areas, implemented through a bundle of policy instruments with unclear combined impact. A revision could redefine and re-organise policy instruments based on evidence of costs and benefits of individual measures and policy packages. Such a revision would also help to consider equity, social and environmental outcomes.

Figure 10.1. Colombia: Development of support to agriculture



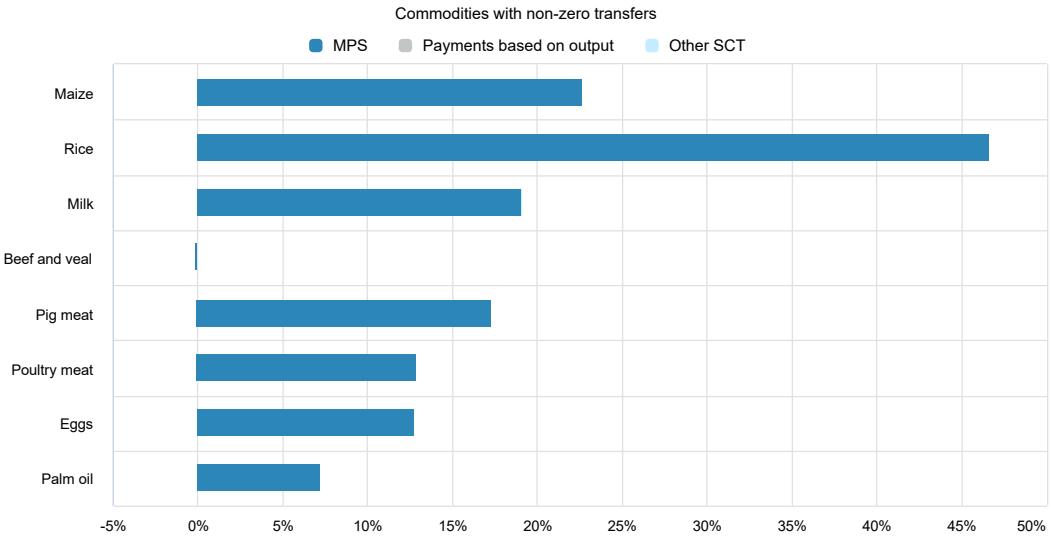
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 10.2. Colombia: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 10.3. Colombia: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 10.1. Colombia: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**10 565**	**27 874**	**29 061**	**27 422**	**27 139**
***of which:** share of MPS commodities (%)*	80.75	68.69	64.28	65.06	76.73
Total value of consumption (at farm gate)	**7 938**	**22 284**	**22 894**	**22 755**	**21 204**
Producer Support Estimate (PSE)	**2 546**	**2 842**	**3 584**	**2 812**	**2 130**
Support based on commodity output	2 460	2 545	3 264	2 565	1 805
Market Price Support[1]	2 460	2 545	3 264	2 565	1 805
Positive Market Price Support	2 466	2 547	3 267	2 567	1 806
Negative Market Price Support	-6	-2	-3	-2	-1
Payments based on output	0	0	0	0	0
Payments based on input use	86	297	320	246	324
Based on variable input use	53	179	187	151	199
with input constraints	36	149	153	132	163
Based on fixed capital formation	16	58	67	46	62
with input constraints	3	26	31	24	24
Based on on-farm services	17	60	66	50	63
with input constraints	5	32	29	31	34
Payments based on current A/An/R/I, production required	0	0	0	0	0
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**24.06**	**9.99**	**12.20**	**10.16**	**7.75**
Producer NPC (coeff.)	**1.31**	**1.10**	**1.13**	**1.10**	**1.07**
Producer NAC (coeff.)	**1.32**	**1.11**	**1.14**	**1.11**	**1.08**
General Services Support Estimate (GSSE)	**154**	**402**	**431**	**307**	**469**
Agricultural knowledge and innovation system	49	185	183	105	265
Inspection and control	9	30	36	33	21
Development and maintenance of infrastructure	95	170	189	151	171
Marketing and promotion	0	17	23	18	11
Cost of public stockholding	0	0	0	0	0
Miscellaneous	1	0	0	0	0
Percentage GSSE (% of TSE)	**5.71**	**12.51**	**10.73**	**9.85**	**18.06**
Consumer Support Estimate (CSE)	**-2 234**	**-3 395**	**-4 375**	**-3 609**	**-2 201**
Transfers to producers from consumers	-2 003	-2 514	-3 146	-2 581	-1 814
Other transfers from consumers	-248	-899	-1 257	-1 043	-396
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	16	17	28	15	9
Percentage CSE (%)	**-28.28**	**-15.06**	**-19.11**	**-15.86**	**-10.38**
Consumer NPC (coeff.)	**1.40**	**1.18**	**1.24**	**1.19**	**1.12**
Consumer NAC (coeff.)	**1.39**	**1.18**	**1.24**	**1.19**	**1.12**
Total Support Estimate (TSE)	**2 700**	**3 244**	**4 015**	**3 119**	**2 599**
Transfers from consumers	2 251	3 412	4 403	3 624	2 210
Transfers from taxpayers	697	731	869	538	785
Budget revenues	-248	-899	-1 257	-1 043	-396
Percentage TSE (% of GDP)	**2.76**	**1.06**	**1.24**	**1.15**	**0.83**
Total Budgetary Support Estimate (TBSE)	**240**	**699**	**751**	**553**	**794**
Percentage TBSE (% of GDP)	**0.25**	**0.23**	**0.23**	**0.20**	**0.25**
GDP deflator (2000-02=100)	**100**	**256**	**248**	**251**	**270**
Exchange rate (national currency per USD)	**2 297.17**	**3 573.67**	**3 281.07**	**3 695.61**	**3 744.32**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Colombia are: maize, rice, sugar, milk, beef and veal, pig meat, poultry, eggs, bananas, plantains, coffee, palm oil and flowers.
Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

The agricultural sector has played an important role in Colombia's economic growth. Until the beginning of the 1990s, agriculture was the main productive sector of Colombia. By the 1960s, Colombia had entered a period of fast expansion in commercial agriculture. Growth, especially in the 1960s and 1970s, was partly a response to incentives to mechanise and intensify the use of modern inputs, and partly a consequence of the sector's protection from imports. The coffee booms of the 1970s and the 1980s coincided with strong growth in agricultural and total GDP. During this time, import substitution policies were used, including tariffs, quantitative restrictions, state marketing enterprise, subsided credit and minimum prices (Anderson and Valdés, 2008[1]).

At the beginning of the 1990s, Colombia entered a decade of trade openness. The Colombian government eliminated its monopoly on agricultural marketing and encouraged private banks to lend to farmers and agricultural exporters. To diversify the markets for Colombian agro-food products, the government negotiated a large number of trade agreements including with Mercosur, the United States, Central America, Chile, Canada, and the European Union (OECD, 2015[2]).

This economy-wide programme of trade liberalisation accompanied deregulation of foreign exchange rates and labour markets. Quantitative trade restrictions were abolished, and import tariffs reduced and replaced by *ad valorem* tariffs. The role of IDEMA (Instituto de Mercadeo Agropecuario), the agricultural marketing institute that had a monopoly over grain imports, was reduced and limited to operate in poor areas with limited access to markets. Minimum guaranteed prices were established for some staple commodities, with international prices used as a benchmark (Anderson and Valdés, 2008[1]).

However, this rapid liberalisation did not allow for economic adjustments, putting the sector in crisis. Under pressure from farmers, the government implemented policies to protect the sector and stabilised producer incomes in the face of price fluctuations in world markets. To stabilise producer prices, the government introduced a price band system for six agricultural commodities, and their substitutes and derivatives, covering 112 products in total. This eventually evolved into the Andean Price Band System (SAFP). Despite the stated purpose of this policy, the construction of the price bands, which fixed the floor and ceiling prices, served as a protective device. Price stabilisation funds (FEP) were also expanded (OECD, 2015[2]).

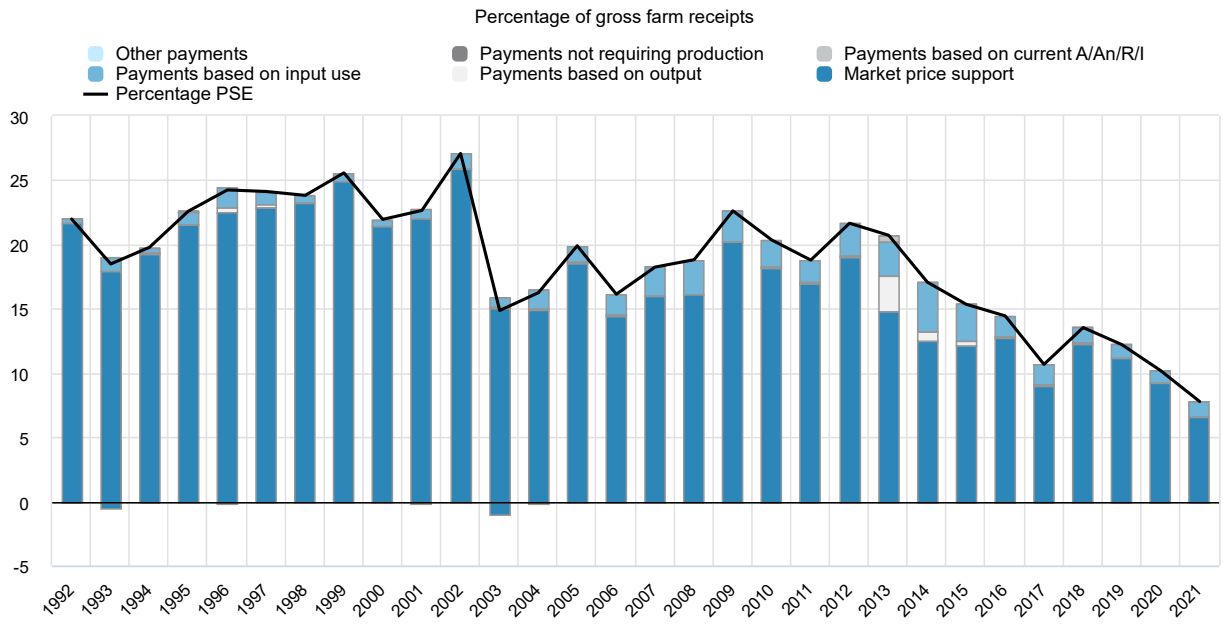
After 56 years of conflict between the government, paramilitary groups and guerrilla groups, a peace agreement was signed in 2016 by the government and the Revolutionary Armed Forces of Colombia (FARC). The negotiations resulted in an agreement with a common vision for rural development. It sets out a long-term vision for the sector focusing on the use of land and water resources, increased productivity and competitiveness, improved infrastructure and other public goods for the agricultural sector, and a redefined institutional architecture to design and implement policy (OECD, 2015[2]).

Colombia's support to agricultural producers relative to gross farm receipts changed little during 1992-2013, but trended downwards since 2014. Support is predominantly provided through market price support. Since 2007, there was a clear trend towards increasing budgetary support to the sector, particularly in 2013 when outlays more than doubled. This trend reversed since 2016, and budgetary allocations have fallen considerably in both absolute and relative terms (Figure 10.4).

Table 10.2. Colombia: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1990s	Import substitution policies	Agricultural input and output tariffs Other border measures establish import rate quotas Minimum prices Export promotions and subsidies for traditional crops (coffee, sugar) State marketing agency (government purchases of agricultural products) Subsided agricultural credit Export taxes
1990-2013	Back and forth changes to trade liberalisation and measures to offset economic crisis Changes to trade liberalisation and some protection measures	Role of the state marketing company reduced and then increased for marketing cereals and oilseeds Reduction of agricultural tariffs for both outputs and inputs Export subsidies Several FTA signed The price band system extend and becomes the Andean Price Band System covering in total 154 products and by-products Quantitative import restrictions created Direct payments introduced Import quotas for some products Expansion of price stabilisation funds to other crops
2013-present	Peace negotiations and agreement	Focus on agricultural innovation and public goods Rural development Efforts to improve the land tenure system Reduction in budgetary allocations

Figure 10.4. Colombia: Level and PSE composition by support categories, 1992 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Agricultural policy in Colombia aims for a competitive, equitable and sustainable development of agricultural, forestry, fisheries and rural development that contributes to improving quality of life for the rural population. Implementation of this objective falls under the Ministry of Agriculture and Rural Development and its affiliated agencies.

Two mechanisms focus on import cost and income stabilisation. One is the Andean Price Band System, which aims to stabilise import costs for 13 commodities including rice, barley, yellow maize, white maize, soya beans, wheat, unrefined soya bean oil, unrefined palm oil, unrefined sugar, refined sugar, milk, chicken cuts and pig meat, as well as for their respective related first-stage processed products.

A second mechanism consists of the Price Stabilisation Funds (FEPs). There are seven FEPs, which are financed and administered by producer associations and cover seven commodities, including cotton, cocoa, palm oil, sugar, beef, milk and coffee. FEPs make payments to producers when the selling price of a product falls below a minimum. When the sales price of a product is higher than an established maximum, producers contribute to the FEPs. The ceiling and floor prices are based on international prices for each product, while transfers and compensations take into account a reference indicator.

Several agricultural programmes provide input support. Main measures include preferential interest rates for agricultural credit, debt rescheduling, sporadic write-offs and insurance programmes. Subsidies are also provided for the purchase of seeds and fertilisers, and for investment related to drainage and on-farm irrigation infrastructure, among others.

Colombia has gradually increased its public expenditures for investments in agricultural research and extension services, such as those for financing the agricultural innovation institution (AGROSAVIA), and other services for the sector. Moreover, the country has made some efforts under the framework of the Peace Agreement on the provision of rural public goods and services, such as irrigation-drainage plan and the technical assistance plan, but more can be done to achieve a sustainable agricultural growth.

Climate change mitigation policies in agriculture

In 2016, agriculture, forestry and other land use (AFOLU) in Colombia contributed 58.5% of total GHG emissions, and agriculture alone contributed 28.7%. Colombia's NDC aims to reduce GHG emissions by 51% compared to a baseline scenario in 2030. Colombia also committed to reducing black carbon by 40% compared to 2014 levels. Colombia's long-term objective is to achieve carbon neutrality by 2050.

The Climate Action Law 2169 was passed on 22 December 2021. It establishes goals and minimum measures to achieve carbon neutrality, climate resilience and low-carbon development in the country in the short, medium and long terms within the framework of Colombia's international commitments on climate issues. The law's purpose is to lay out a roadmap to the country's environmental goals, including: carbon neutrality by 2050; reducing black carbon emissions 40%; reducing GHG emissions by 51% with respect to the 2030 emissions reference scenario in Colombia's NDC (up to 169.44 $MtC0_2eq$) by 2030; and reaching zero net deforestation of natural forest by 2030, based on the implementation of both policy tools and market measures. On agriculture, the law also stipulates adopting climate change considerations (mitigation and adaptation) in planning instruments for the agricultural sector (PIGCCS) by 2030, and implementing adaptation actions. Lastly, Colombia is a participant in the Global Methane Pledge, which reaffirms its commitments to mitigation measures.

Colombia created a National Appropriate Mitigation Action (NAMA) for livestock in 2017. In 2021, it implemented four actions targeting the farming sector to reduce GHG emissions: (1) the sustainable Colombian livestock project led by the Colombian Federation of Cattle Breeders (FEDEGAN), CIPAV, Fondo Acción and The Nature Conservancy (TNC); (2) the Joint Declaration of Intent (JIU) between Norway, Germany, the United Kingdom and Colombia, which aims to reduce GHG emissions from

deforestation, mitigate forest degradation (REDD+) and promote sustainable development; (3) an IADB technical co-operation project called the Comprehensive Programme for the Reconversion of Livestock in Colombia (PIRPAG) in order to contribute to closing the agricultural land use frontier and promote sustainable bovine production activities in accordance with land use; and (4) the Round Table on Sustainable Livestock (MGS-Col), an inter-agency public-private technical consulting body on sustainable livestock that will design a benchmark for the policy design of processes, programmes and projects around sustainable livestock production.

In 2016, a NAMA for Colombian coffee was created. This NAMA seeks to develop and implement strategies for mitigating GHG emissions along the coffee value chain, from production, processing, marketing and transportation of coffee. This NAMA focuses on: (1) reducing on-farm emissions, including through more efficient use of fertilisers, improved cultivation practices and handling of chemical products, and improved post-harvesting processes; (2) increasing energy efficiency in the coffee transformation process; (3) reducing emissions in the transportation of coffee. In 2018, a NAMA for the panela sector (production of raw sugar) was put in place. This NAMA contains the objectives, baseline, measures, barriers, measuring, reporting and verification (MRV) system, governance structure and financial resources necessary for the development of the Colombian panela sector towards a low-emission development strategy. This NAMA has similar measures as the coffee NAMA, which includes efficient use of fertilisers, improved cultivations practices, and others.

Domestic policy developments in 2021-22

In 2021 the policy framework strategy “Together for the Countryside” (*Juntos por el campo*) continued its implementation. The framework has six pillars: 1) the organisation (i.e. the use of zoning for a better use of land) of the agricultural production for 11 priority products, including cocoa, avocado, potato, dairy, forestry, rice, corn, onion, sugarcane, fishing, and aquaculture; and for 5 strategic crops including flowers, palm, coffee, bananas, and sugar. This pillar has two focus areas: the phytosanitary protection, and planning based on soil suitability. 2) Agricultural extension that aims to reach 550 000 producers. 3) Extending credit access and better credit conditions (i.e. more preferential rates) to farmers. 4) Financing rural public goods such as infrastructure, processing agroindustry, storage and cold chains, and irrigation districts. 5) Supporting technology and innovation. 6) Support for productivity through subsidies for agricultural inputs.

Total public expenditures allocated to the agricultural sector increased substantially in 2021 (66% relative to 2020). Several programmes focused on production management, improving sanitary status, climate initiatives, institutional capacity, and innovation and development increased their funding. In January 2022, the Fund for Access to Agricultural Inputs was created to finance production, transportation, storage and other activities necessary for the efficient, competitive, and sustainable use of agricultural inputs. It also centralises purchases of agricultural inputs, grants guarantees for agricultural input imports, and supports financial instruments or coverage policies for foreign exchange differential. From 2018 to 2022, about 50 000 land titles have been issued, formalising around 1 319 000 hectares, benefitting 58 987 families. During this period, 3 567 land properties, or 62 089 hectares, were returned to their rightful owners.

The Climate Action Law of 2021, will incorporate by 2030 criteria related to climate adaptation and resilience in the plans, programmes and projects of the institutions linked to the Ministry of Agriculture and Rural Development (MARD). The law proposes implementing by 2030, in at least 11 agricultural subsectors (rice, corn, potato, beef cattle, dairy cattle, panela cane, cocoa, banana, coffee, sugar cane and oil palm), models that improve their capacities to adapt to climate variability and change, through research, technological development and the adoption of productive transformation practices for agricultural and livestock activities to make them more resilient. Also to incorporate by 2030, in the sectoral competitiveness agreements, measures for productive transformation through the implementation of state-of-the-art technologies (genetics, biotechnology, Agriculture 4.0, metabolomics and other technological

tools) necessary to meet national goals, for adaptation to climate change, by all agricultural value chains by MARD. Lastly, the law also proposes expanding to 2030 the coverage and participation in the agro-climatic technical roundtables to five natural regions of the country (Andean, Caribbean, Amazon, Pacific and Orinoquía), in co-ordination with the national agro-climatic roundtables, and provide agro-climatic information to all farmers in the country.

Domestic policy responses to the COVID-19 pandemic

As a response to COVID-19 crisis, income support measures such as the Formal Employment Support Program (PAEF), the Support Program of the Prime service (PAP) and the Solidarity revenue programme were created. These programmes also benefit agricultural workers. Other programmes supporting the special credit lines (LEC), subsidies for purchases of agricultural inputs, transportation, storage, and marketing of agricultural products were strengthened.

The emergency mitigation fund FOME, created by Decree 486 in 2020 and implemented during 2020 and 2021, provided economic transfers to agricultural producers in order to avoid market disruptions in the agro-food value chains due to the pandemic.

Trade policy developments in 2021-22

In 2021, negotiations for a free trade agreement (FTA) with Curacao were resumed after being interrupted due to the COVID-19 pandemic. Negotiations for an FTA with the United Arab Emirates started in the first months of 2022.

Trade policy responses to the COVID-19 pandemic

To mitigate domestic price increases as a consequence of the pandemic, the agriculture input Law was approved in December 2021, this Law has set to 0% tariffs on agriculture inputs. This Law also allocates resources to support small and medium scale farmers that use environmentally friendly fertilisers and inputs.

Moreover, Colombia has suspended the Andean Price Band System for the following products and established a fixed tariff of rice (80%), milk powder (98%), white corn (40%), whey (94%), wheat (0% temporarily until June 2022). Additionally, Colombia has limited the application of some tariffs up to the following maximum levels: for crude soybean oil, soybean and crude palm oil up to a maximum level of 40%, wheat up to a maximum level of 35%, white and raw sugar up to a maximum level of 70%, roosters and chickens fresh or refrigerated, frozen without cutting up to a maximum level of 92%. Seasoned and frozen pieces of turkey, preparations and preserves of meat, offal or blood, of rooster or hen, in seasoned and frozen pieces, other seasoned and frozen pieces of poultry up to a maximum level of 70%.

To reduce the impact of high food prices, in March 2022, Colombia passed the 307 Decree, which establishes a tariff of 0% for six months for 163 products[1] that are part of the basic household basket. The Decree also establishes a 0% tariff and suspends for six months the application of the Andean Price Band System for the following products: malt (from barley or other cereals), unroasted, classified under subheading 1107100000; and roasted malt (from barley or other cereals), classified under subheading 1107200000. Moreover, in April 2022, under the 504 Decree[2], the country reduced to 0% import tariff 39 additional agricultural input products for twelve months, and another 36 agricultural products for six months.

Contextual information

Colombia has a surface of 1.1 million km^2; it is the only South American country that borders both the Atlantic and Pacific Oceans. Colombia has abundant agricultural land and fresh water, is very biodiverse and is rich in natural minerals and fossil fuels. Agriculture continues to be an important sector for the economy – accounting for 16.5% of employment and 7.6% of GDP in 2020. Colombia has a dualistic distribution of land ownership where traditional subsistence smallholders co-exist with large-scale commercial farms. Even if the relative weight of agro-food exports in total exports has declined over the years, the sector continues to make a significant contribution to the country's exports, with agro-food exports accounting for a quarter of all exports in 2020 (Table 10.3).

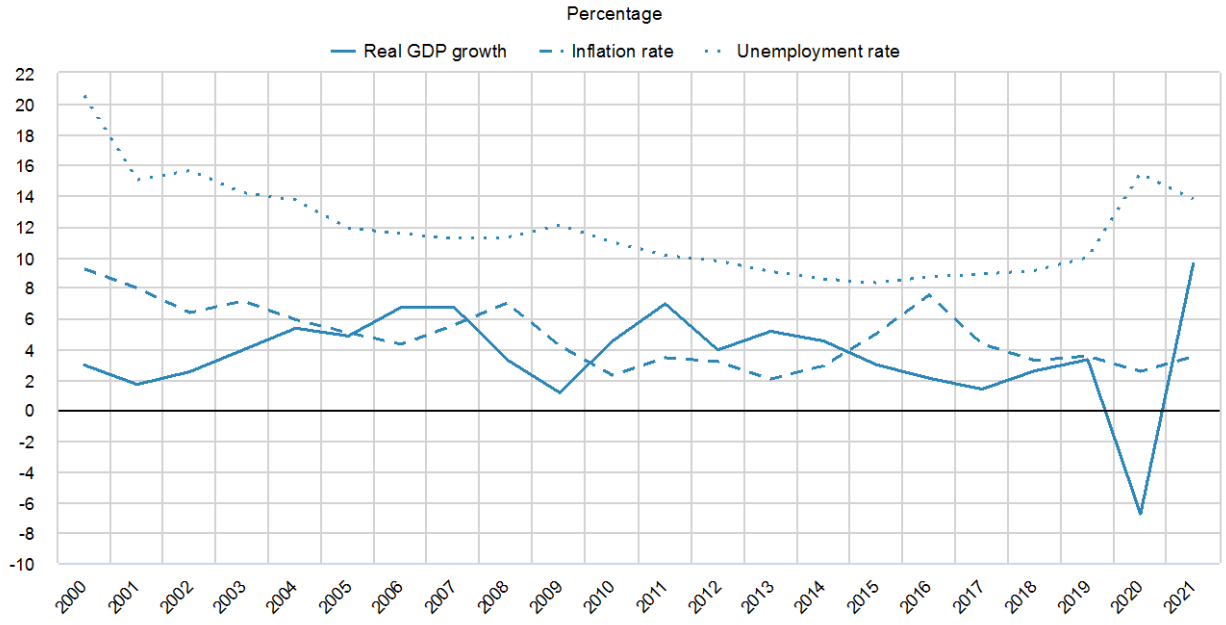
Table 10.3. Colombia: Contextual indicators

	Colombia		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	265	741	0.7%	0.7%
Population (million)	39	49	0.9%	0.9%
Land area (thousand km^2)	1 110	1 110	1.4%	1.3%
Agricultural area (AA) (thousand ha)	44 859	49 696	1.5%	1.7%
			All countries[1]	
Population density (inhabitants/km^2)	36	46	53	63
GDP per capita (USD in PPPs)	6 690	14 565	9 281	20 929
Trade as % of GDP	12	14	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	8.3	7.6	2.9	4.9
Agriculture share in employment (%)	22.3	16.5	-	-
Agro-food exports (% of total exports)	22.3	24.8	6.2	8.5
Agro-food imports (% of total imports)	12.8	15.0	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	59	62	-	-
Livestock in total agricultural production (%)	41	38	-	-
Share of arable land in AA (%)	..	12	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

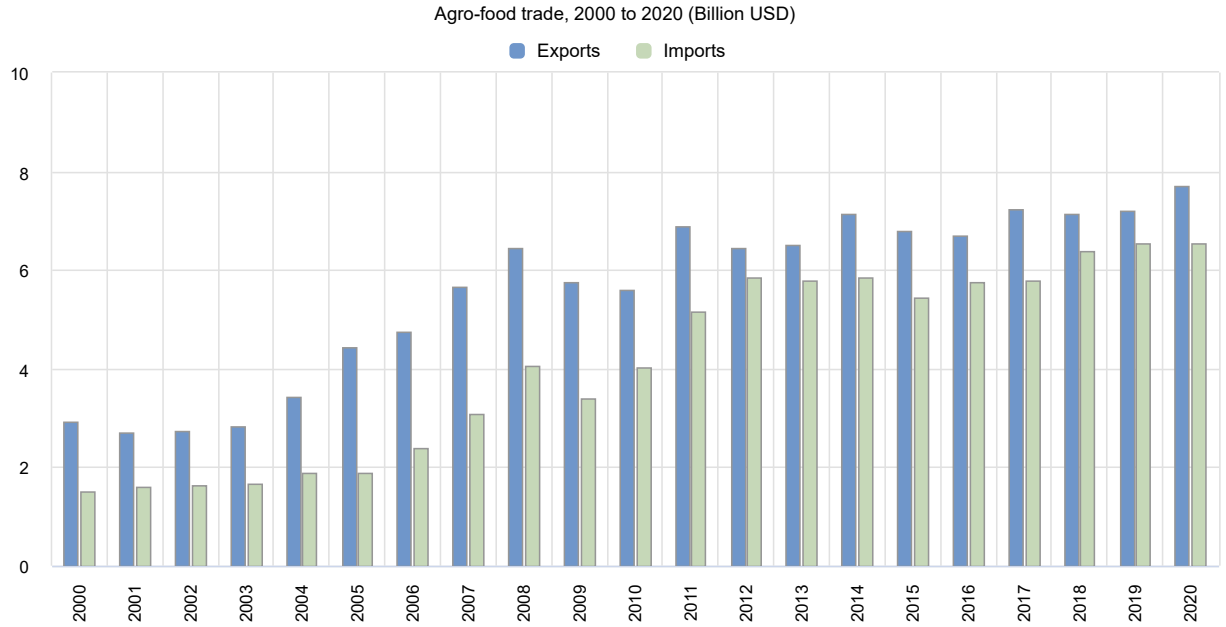
In 2021, Colombia saw its real GDP growth increase to 9.5% after an economic contraction of almost 7% in 2020, caused by the COVID-19 pandemic. Employment experienced a small recovery with unemployment falling to 13.8% from the 15.4% rate observed in 2020. The inflation rate remained relatively stable at 3.5% in 2021. The country has been a net exporter of agricultural and food products with a net surplus of USD 1.2 billion in 2020. Colombia's agro-food exports are almost equally split between those destined for final consumption (53%) and those that are sold as intermediate inputs (48%) for use in manufacturing sectors in foreign markets. In contrast, the majority of agro-food imports (66%) are in the form of intermediates for further processing in the country (Figures 10.5 and 10.6).

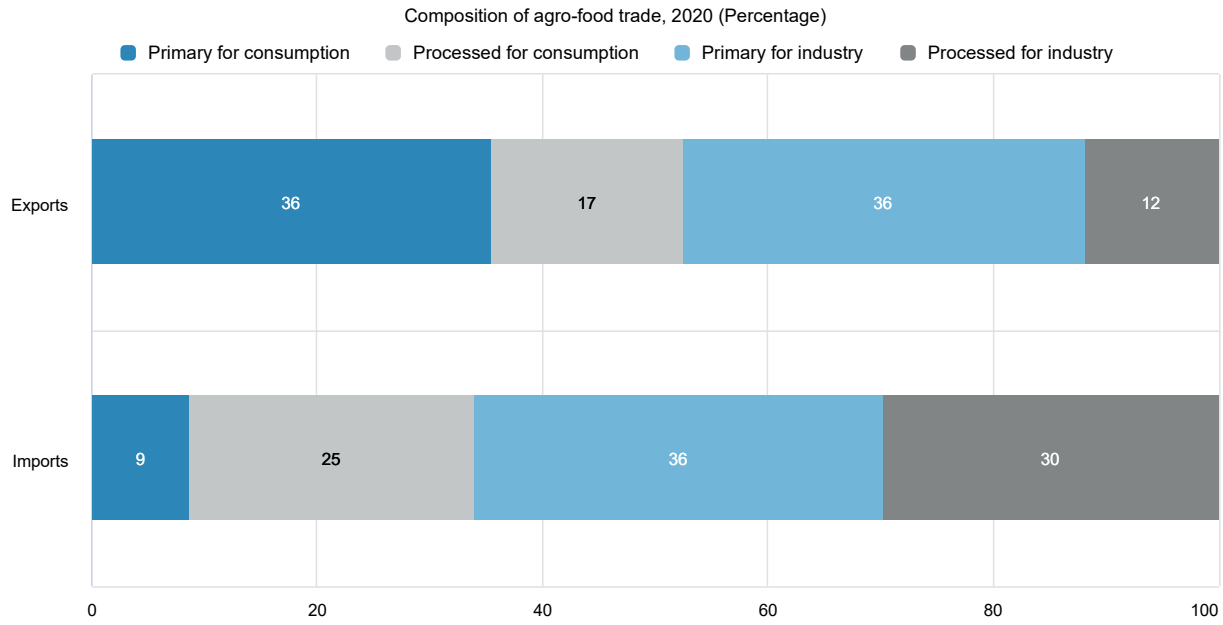
Figure 10.5. Colombia: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 10.6. Colombia: Agro-food trade

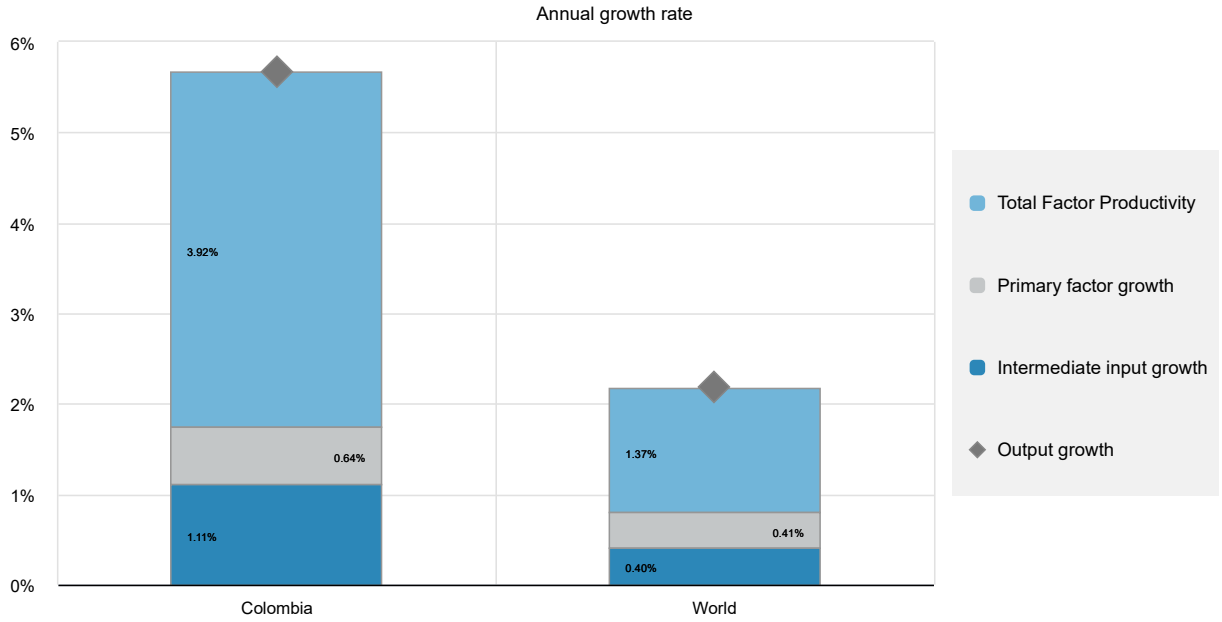




Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Colombia has witnessed rapid output growth of 5.6% p.a. for the period 2010-2019. This growth is mostly due to Total Factor Productivity (TFP) growth, which was 3.9% over the same period, far above the world average. Rising use of intermediary inputs and, to a lesser extent, of primary production factors also contributed to output growth. Agriculture is the main water user with a share of 59.6% total water use, above the OECD average. Furthermore, in 2016 agriculture contributed with 28.7% of GHG emissions. In contrast, nitrogen balance is comparatively low and has slightly fallen since the early 2000s, while phosphorous balance is higher than world average (Figure 10.7 and Table 10.4).

Figure 10.7. Colombia: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 10.4. Colombia: Productivity and environmental indicators

	Colombia		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.1%	3.9%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	10.0	7.1	32.1	30.0
Phosphorus balance, kg/ha	5.8	6.0	3.4	2.9
Agriculture share of total energy use (%)[1]	6.0	0.9	1.7	2.0
Agriculture share of GHG emissions (%)	34.1	28.7	8.6	9.7
Share of irrigated land in AA (%)	..	2.2	-	-
Share of agriculture in water abstractions (%)	..	14.4	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
1. Data are not directly comparable between time periods due to change in methodology in 2013.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

Anderson, K. and A. Valdés (2008), *Distortions to Agricultural Incentives in Latin America*, World Bank, Washington DC, https://openknowledge.worldbank.org/handle/10986/6604. [1]

OECD (2015), *OECD Review of Agricultural Policies: Colombia 2015*, OECD Review of Agricultural Policies, OECD Publishing, Paris, https://doi.org/10.1787/9789264227644-en. [2]

Notes

1

https://dapre.presidencia.gov.co/normativa/normativa/DECRETO%20307%20DEL%203%20DE%20MARZO%20DE%202022.pdf (in Spanish).

2

https://dapre.presidencia.gov.co/normativa/normativa/DECRETO%20504%20DEL%204%20DE%20ABRIL%20DE%202022.pdf (in Spanish).

11 Costa Rica

Support to agriculture

Costa Rica's agricultural support for producers (PSE) amounted to 4.9% of gross farm receipts in 2019-21, well below the OECD average and down from 8.2% in 2000-02. Agricultural support comes almost entirely (89%) from market price support (MPS), one of the most trade- and production-distorting forms of support, generated through border measures (tariffs) and domestic measures (minimum reference prices). Products with the most support include rice, poultry, pig meat and sugar. Border protection and price interventions inflated producer prices by 5% on average relative to international prices in 2019-21. The remaining producer support (10.9%) comes through payments for environmental services and input subsidies for agricultural equipment and machinery.

Spending on general services (GSSE) accounted for 1.3% of the value of agricultural production in 2019-21. This spending saw an increase of 0.3% since 2000-02 but remains well below the OECD average. In 2019-21, these expenditures were allocated to three areas: (1) the agricultural knowledge and innovation system, particularly extension services; (2) development and maintenance of irrigation and rural roads infrastructure; and (3) inspection and control. Total support to the sector (TSE) corresponded to 0.5% of GDP in 2019-21, a significant decline from 2000-02.

Recent policy changes

The *Puente Agro* initiative was implemented in 2021 as part of the National Strategy for Poverty Reduction, which provides support, through health services, education, housing, labour and social protection to families in rural areas who live in extreme poverty. The initiative aims to support farmers in improving their productive processes through the provision of equipment, inputs and technical assistance.

Under the legislation passed in 2021 that seeks to strengthen the central government's budgetary control of decentralised bodies, the Ministry of Agriculture (MAG) exercises greater control and supervision in formulating and executing the budgets of agencies such as the National Animal Health Service (SENASA), the State Phyto-sanitary Service (SFE), the National Institute for Innovation and Transfer of Agricultural Technology (INTA) and the National Council of 4S Clubs (CONAC).

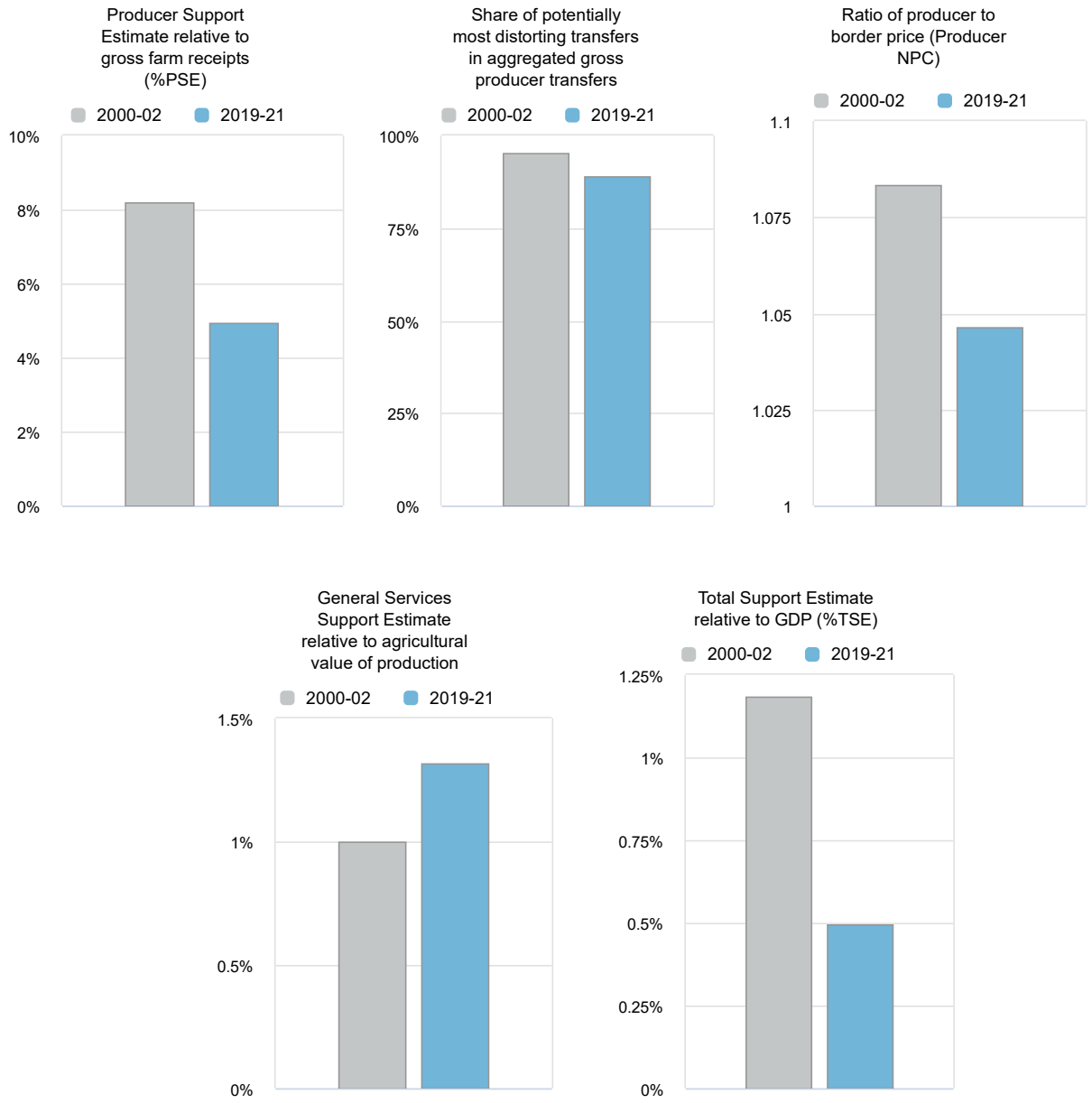
Assessment and recommendations

- Costa Rica's National Decarbonisation Plan 2018-2050 aims at net-zero emissions by 2050, with a maximum of 9.11 $MtCO_2eq$ net emissions by 2030. The Plan includes strategies for decarbonisation of all sectors, including agriculture. However the agricultural strategies focus on improving practices that impact emissions but do not include a sectoral specific mitigation target.
- Most producer support comes through border protection for specific products – namely rice, poultry, pig meat and sugar – and minimum reference prices for rice. This support distorts both domestic

markets and trade, and constrains competition, productivity and competitiveness. The government should consider gradually phasing out this support and replacing it with payments targeted to producers in need on a temporary basis.

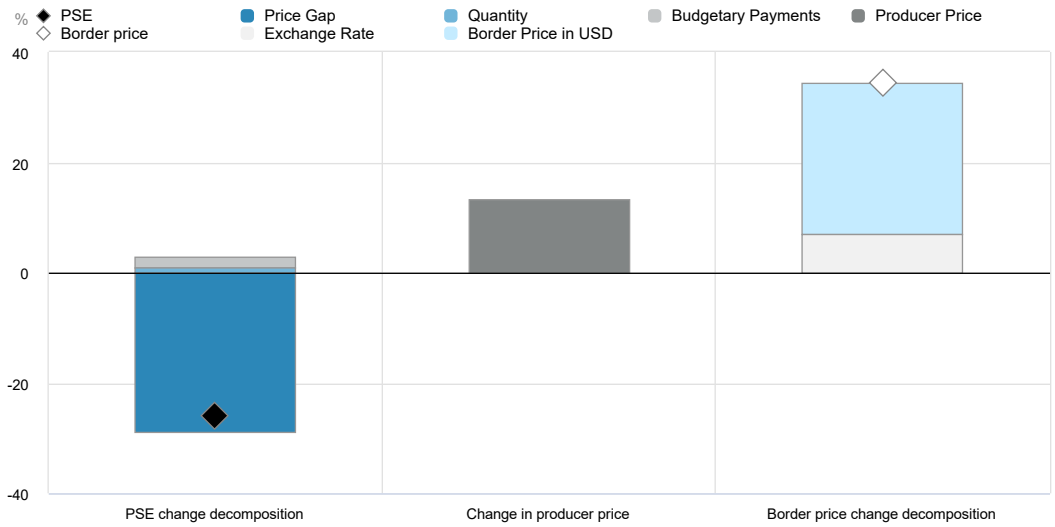
- The low quality and coverage of agricultural infrastructure is a significant bottleneck, preventing the sector from becoming more efficient and responsive to market signals. Investments are required to enhance productivity (e.g. irrigation and drainage) and facilitate access to markets (e.g. transportation, distribution, cold-chain facilities).
- Limited capacity and resource misallocations constrain the effectiveness of Costa Rica's extension services, which account for 20% of public expenditures to the sector. Given the importance of these to the agricultural sector, efforts should ensure that funding is used more efficiently, including providing training to extension services personnel on new production systems and management, streamlining and reducing the administrative burden for technical staff, and improving coordination between research agencies, extension services and farmers' needs.
- Small-scale producers suffer low productivity and poor access to credit and financial tools. In addition, stringent requirements impede small-scale farms from taking advantage of available credit sources from commercial banks. While avoiding moral hazard, credit programmes provided by the national development bank and agricultural organisations or co-operatives could expand to improve the financial infrastructure and access to credit for smallholders.
- Costa Rica has a history of environmental protection and sustainable development policies such as improved farming and livestock practices through the Nationally Appropriate Mitigation Actions (NAMAs). Despite these, opportunities for improvement remain. The country should align climate change adaptation and mitigation with agricultural development objectives. Farmers' awareness could be enhanced through coordination between R&D and technical assistance.

Figure 11.1. Costa Rica: Development of support to agriculture



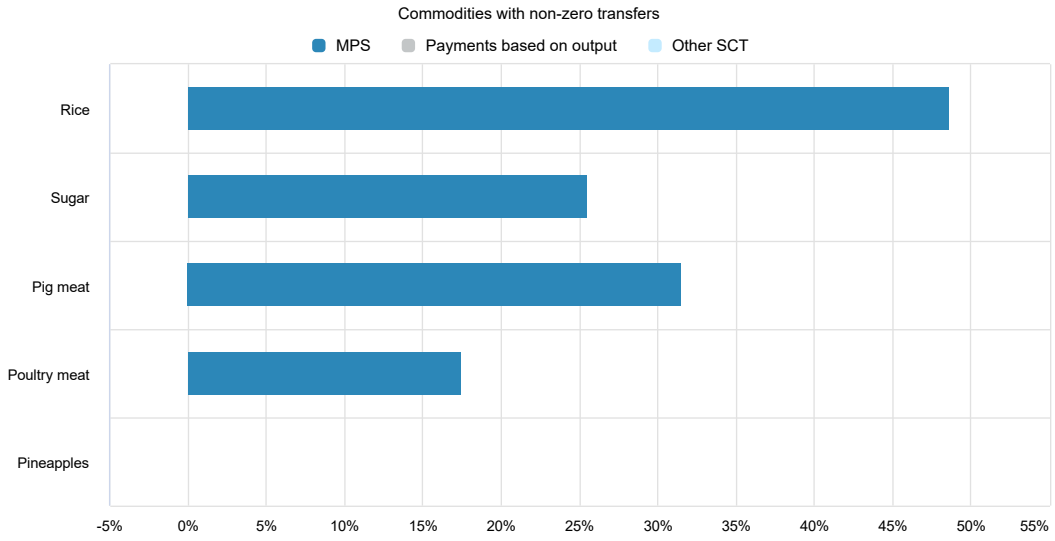
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 11.2. Costa Rica: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 11.3. Costa Rica: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 11.1. Costa Rica: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**2 039**	**4 959**	**4 884**	**4 899**	**5 094**
***of which:** share of MPS commodities (%)*	85.80	83.31	82.77	82.44	84.71
Total value of consumption (at farm gate)	**1 051**	**2 264**	**2 287**	**2 308**	**2 197**
Producer Support Estimate (PSE)	**167**	**248**	**265**	**281**	**196**
Support based on commodity output	156	220	239	256	167
Market Price Support[1]	156	220	239	256	167
Positive Market Price Support	156	220	239	256	167
Negative Market Price Support	0	0	0	0	0
Payments based on output	0	0	0	0	0
Payments based on input use	10	26	25	24	28
Based on variable input use	4	12	14	11	10
with input constraints	1	11	14	11	10
Based on fixed capital formation	1	7	5	8	9
with input constraints	0	1	1	1	1
Based on on-farm services	5	7	6	6	10
with input constraints	3	0	0	0	0
Payments based on current A/An/R/I, production required	0	0	0	0	0
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	1	1	1	1	1
Based on long-term resource retirement	0	1	1	1	1
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	1	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**8.20**	**4.94**	**5.40**	**5.71**	**3.83**
Producer NPC (coeff.)	**1.08**	**1.05**	**1.05**	**1.06**	**1.03**
Producer NAC (coeff.)	**1.09**	**1.05**	**1.06**	**1.06**	**1.04**
General Services Support Estimate (GSSE)	**20**	**65**	**62**	**63**	**72**
Agricultural knowledge and innovation system	10	28	28	30	25
Inspection and control	3	16	12	12	23
Development and maintenance of infrastructure	7	21	21	20	22
Marketing and promotion	0	1	1	1	1
Cost of public stockholding	0	0	0	0	0
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**10.80**	**20.97**	**18.88**	**18.22**	**26.72**
Consumer Support Estimate (CSE)	**-179**	**-270**	**-287**	**-316**	**-208**
Transfers to producers from consumers	-149	-191	-200	-229	-142
Other transfers from consumers	-30	-80	-86	-87	-65
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	0	0	0	0	0
Percentage CSE (%)	**-16.96**	**-11.89**	**-12.54**	**-13.71**	**-9.45**
Consumer NPC (coeff.)	**1.20**	**1.13**	**1.14**	**1.16**	**1.10**
Consumer NAC (coeff.)	**1.20**	**1.13**	**1.14**	**1.16**	**1.10**
Total Support Estimate (TSE)	**188**	**313**	**327**	**344**	**268**
Transfers from consumers	179	270	287	316	208
Transfers from taxpayers	39	122	127	115	125
Budget revenues	-30	-80	-86	-87	-65
Percentage TSE (% of GDP)	**1.18**	**0.50**	**0.51**	**0.56**	**0.43**
Total Budgetary Support Estimate (TBSE)	**31**	**92**	**88**	**88**	**101**
Percentage TBSE (% of GDP)	**0.20**	**0.15**	**0.14**	**0.14**	**0.16**
GDP deflator (2000-02=100)	**100**	**353**	**350**	**350**	**357**
Exchange rate (national currency per USD)	**331.77**	**597.68**	**587.02**	**584.68**	**621.35**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Costa Rica are: rice, sugar, milk, beef and veal, pig meat, poultry, bananas, coffee, palm oil and pineapple.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Costa Rica's agricultural policy progressed through three distinct phases over time. From the 1960s to the 1980s, Costa Rica's agricultural sector followed an import substitution path, supported by government market interventions, such as price control and agricultural import tariffs (Anderson and Valdés, 2008[1]).

From the mid-1980s to the mid-2000s, agricultural support policies evolved in line with Costa Rica's outward-oriented growth strategy. Market intervention decreased significantly, combined with continued domestic reforms and increasingly trade liberalisation. Reforms involved elimination of price controls (except rice), removal of export taxes and reduction of import tariffs. Costa Rica fully integrated into international markets, and free trade agreements resulted in duty-free imports from many countries, although import tariffs still apply to some agricultural products (Anderson and Valdés, 2008[1]; OECD, 2017[2]).

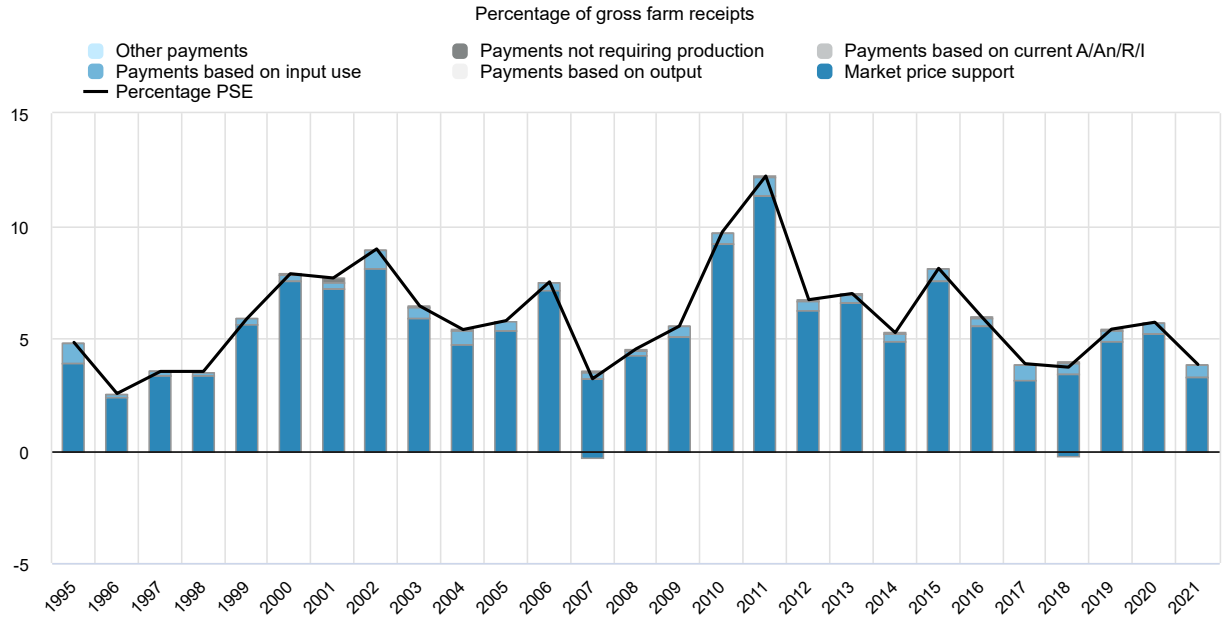
Since the food price crisis of 2007-08, which fuelled food security concerns in the country, specific programmes have been aimed at increasing productivity of staple foods, particularly through extension services targeting small-scale farmers. Reforms to the rice price system took place in 2015 with the introduction of a minimum reference price, which works more as an indicative rice price. Costa Rica's policies continue nevertheless to emphasise export-oriented agriculture and prioritise sustainability and smallholders (Table 11.2) (OECD, 2017[2]).

Table 11.2. Costa Rica: Agricultural policy trends

Period	Framework	Changes in agricultural policies
Prior to 1980s	Closed economy	Import substitution approach; price interventions on agricultural products, particular emphasis on guaranteed price for rice; high tariffs on agricultural product imports Creation of the National Production Council (CNP) in the 1940s to promote agricultural and industrial production, control agricultural prices and own public infrastructure for the collection, storage, transport and distribution of grains
1980s-2007/08	Gradual shifts to open the economy	Dismantling price interventions, but minimum price for rice continued Reduction of trade barriers (import and export tariffs) Reforms to CNP end most functions, keeping only the Institutional Supply Programme (PAI), which purchases food from small and medium farms for consumption in public institutions Strengthening agricultural exports via product diversification and development of destination markets; several FTAs signed; incentives (including in agriculture) to domestic and foreign companies to attract FDI, such as the Free Trade Zone Regime (FTZ) providing tax benefits and preferential port rates Creation of agricultural institutions for animal health (SENASA), plant health (SFE), agricultural innovation (INTA) Creation of the Rural Development Institute (IDA/INDER)
Since 2008	Open economy with a focus on sustainability and small-scale farmers	Emphasis on extension services for small-scale farms; promotion of good agricultural practices Small and limited payments to farmers for environmental services Changes to rice price, from guaranteed price to a reference price in 2015 Continued use of import tariffs

Producer support fluctuated between 7% and 12% of gross farm receipts over the last 20 years, based predominantly on market price support. MPS concentrates mostly on rice and livestock products, accounting for around 90% of the PSE. In contrast, budgetary support to producers is limited, with little change over time (Figure 11.4). Around 80% of total budgetary allocations to the sector are destined to general services. R&D, extension services, rural infrastructure, inspection and control account for 98% of total expenditures on general services in the last ten years. Costa Rica does not provide budgetary transfers to consumers.

Figure 11.4. Costa Rica: Level and PSE composition by support categories, 1995 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The agricultural policy framework of Costa Rica is guided by the 2019-2022 Policy Guidelines for the Agricultural, Fishing and Rural Sector. This framework seeks to: 1) improve the social and economic well-being of people employed in agriculture; 2) achieve a mechanised, competitive, inclusive and sustainable agriculture with responsive, modern and co-ordinated public institutions and; 3) create a sector resilient to physical, biological, economic and social impacts. The guidelines also have a crosscutting axis of climate actions and disaster risk reduction in the production of goods and services by strengthening the capacities of public institutions and farmers.

The country maintains a wide range of border measures, in particular tariffs for several agricultural products (rice, poultry, pig meat, milk, sugar, etc.). Moreover, the country maintains a reference price for rice. This reference price is based on domestic production costs, processing costs, international prices, and defined by the National Rice Corporation (CONARROZ) with the supervision of the Ministries of Agriculture, Economy and Industry. This reference price imposes a burden on consumers, as domestic prices are higher than international prices.

Budgetary policy instruments predominantly focus on providing general services to agriculture, including extension services, R&D, and plant and animal health services, with a significant emphasis on environmental protection. The Agricultural Technology Research and Transfers Institute (INTA) manages agricultural R&D and innovation. Together with the MAG's National Directorate of Agricultural Extension, INTA also operates technology transfer and extension services to farmers. The National Animal and Health Service (SENASA) and the National Phytosanitary Service (SFE) are in charge of animal and plant health services.

In addition, farmers receive a number of relatively small subsidies. These include payments for environmental services such as the use of green or living fences and terraces, organic production or soil condition improvements, implicit subsidies through credit at preferential interest rates, and some subsidies for fixed capital formation mostly directed to small-scale farmers.

Climate change mitigation policies in agriculture

Agriculture is a major contributor to greenhouse gas (GHG) emissions in Costa Rica, with 20.5% of national emissions in 2017, behind the energy sector's 55% and ahead of land waste's 14.8%. Costa Rica committed to a completely decarbonised economy by 2050. Costa Rica's contribution does not consider a comparative benchmark. The country's goal is composed of two objectives: (1) maximum 9.11 $MtCO_2eq$ net emissions by 2030, with emissions per capita of 1.73 net tonnes by 2030; and (2) absolute maximum net emissions of 106.53 $MtCO_2eq$ for 2021-30. To accomplish this, Costa Rica will have to reduce 170 500 tonnes of GHG per year until 2030. To do so, the country created the National Decarbonisation Plan 2018-2050, which defines annual goals for reducing GHG emissions (GEI).

This plan contains actions for the agricultural sector in its Axis 8 (agriculture) and Axis 9 (cattle ranching). Axis 8 relates to the promotion of efficient agri-food systems that generate low-carbon goods for export and domestic markets. It suggests that the subsectors of coffee, livestock, sugar-cane, rice and banana need to apply technologies by 2030 that reduce emissions at the farm and processing levels, and that the sector needs to use advanced technology by 2050 for sustainable, competitive, low-carbon and resilient agriculture. Axis 9 relates to the consolidation of an eco-competitive livestock model based on productive efficiency and reduction of GHG emissions. This axis suggests that the livestock sector should implement a circular economy by 2025; that 70% of the livestock herd and 60% of the area dedicated to livestock should implement low-carbon technologies by 2030; and all livestock activities should use advanced technology low in emissions and be resilient to climate change by 2050.

Within this context, the Sectoral Office for Climate Actions and Decarbonisation (SOCAD) was created in 2019 in the Directorate of Extension Services (DNEA) within the MAG. It oversees Nationally Appropriate Mitigation Actions (NAMA) for livestock and coffee, and development of banana, rice and sugarcane NAMAs.

In 2021, SOCAD provided technical support and training to 35 coffee farms for the implementation of Good Agricultural Practices (GAP). For the livestock NAMA, SOCAD trained 200 DNEA officials to formulate diets for animal feed, monitor livestock farms, and implement NAMA measures, including: (1) rotational grazing, (2) silvopasture systems, (3) plants and animals adapted to national climates, (4) monitoring, reporting and verification (MRV) systems for data generation on carbon storage in soils and plant tissues, and (5) estimation of emissions from enteric fermentation and nitrous oxide.

Technical monitoring of 1 652 cattle farms took place in 2021, and NAMA actions were recorded in the DNEA's online information system for subsequent measurements. With the support of the National Livestock Corporation, 25 school farms trained to disseminate NAMA measures, including: (1) silvopasture systems, (2) animal health, (3) traceability, (4) genetic improvement, (5) water distribution networks, and (6) monitoring, reporting and verification (MRV) systems for data reporting throughout the country. SOCAD continues to work on the pilot plans for the development of NAMAs for sugarcane, rice and bananas.

During 2021, DNEA-MAG supported investments with environmental benefit that encourage improvements in agricultural farms related mitigation and adaptation to climate change, and organic agriculture. Some of these investments were in the renovation of degraded pastures; fodder banks for improving nutrition in livestock; rotational grazing systems with live fences and electric fences using solar panels; organic waste-composting systems as a source of fertiliser; protected environment systems for annual crop production; and infrastructure and equipment for bio inputs production.

Domestic policy developments in 2021-22

In 2021, as part of the National Strategy for Poverty Reduction that provides support to families in rural areas who live in extreme poverty, through health services, education, housing, labour and social protection; the *Puente Agro* initiative was implemented and aims to support farmers in improving productive processes through the provision of equipment, inputs, and technical assistance.

In order for the Ministry of Agriculture (MAG) to exercise greater control and supervision in the formulation and execution of budgets, recent legislation in 2021 seeks to strengthen the central government's budgetary control of decentralised bodies. The MAG now exerts more control over the budgets of agencies such as the National Animal Health Service (SENASA), the State Phyto-sanitary Service (SFE), the National Institute for Innovation and Transfer of Agricultural Technology (INTA) and the National Council of 4S Clubs (CONAC).

The DESCUBRE programme, a public initiative linking farmers to markets, continued to focus on improvements and adjustments to the products' quality, certification, post-harvest innovation, logistics, and other features, required for better access to export markets.

Domestic policy responses to the COVID-19 pandemic

In 2021, the National Commission for Risk Prevention and Emergency Attention (CNE), as part of the project to assist producers of staple grains (rice) and beans affected by COVID-19, provided financial support for the purchase of seeds, fertilisers and herbicides to reactivate the production. The programme proved support to 2 708 small and medium-size rice and bean producers, accounting for approximately 5 415 hectares.

Trade policy developments in 2021-22

In 2021, Costa Rica continued with the dispute (that started in 2015) at the WTO, on avocados halt imports from Mexico arguing sanitary and phyto-sanitary problems (SPS). The WTO panel issued its final report on April 13, 2022 and determined that Costa Rica acted inconsistently with Article 1.1 of the SPS Agreement, suggesting that halt imports from Mexico were not based on SPS.

Contextual information

Costa Rica is a small country with a population of 5 million. The country's long democratic tradition and political stability have underpinned its important economic progress – including the development of its agricultural sector. Agriculture still plays a relatively important role in the economy, contributing 11.9% to the country's employment and 4.5% to GDP. Costa Rica has achieved higher standards of living and lower poverty rates than other countries in the region, with a per capita income of USD 21 032 (PPP) in 2020 (Table 11.3).

Table 11.3. Costa Rica: Contextual indicators

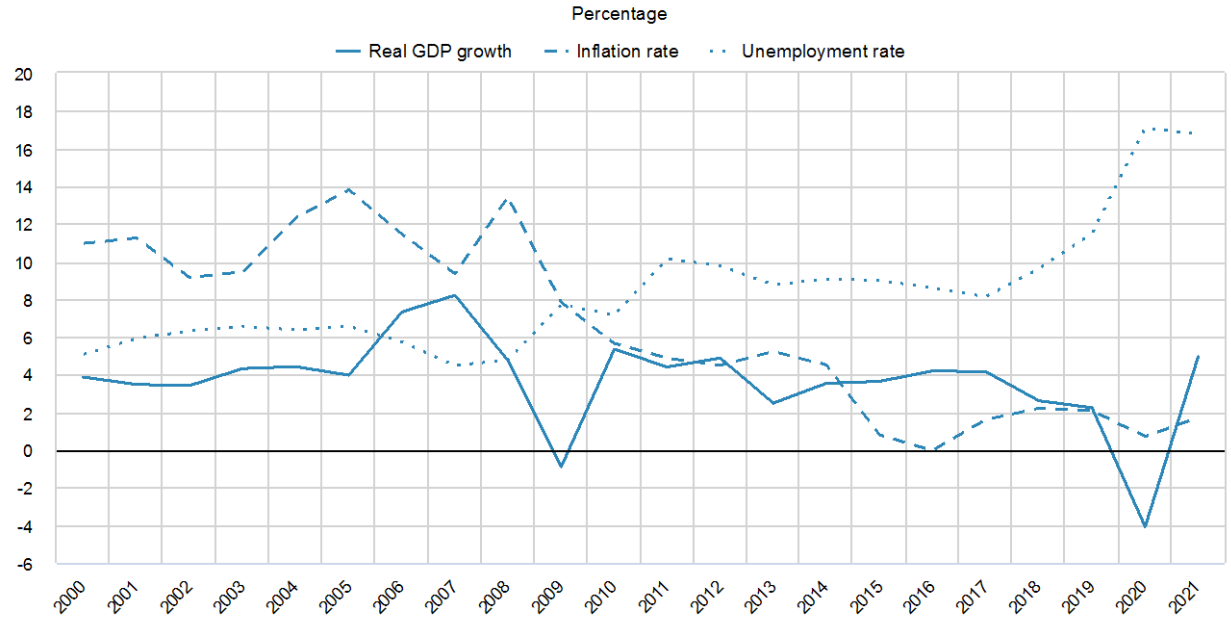
	Costa Rica		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	32	108	0.08%	0.10%
Population (million)	4	5	0.09%	0.10%
Land area (thousand km^2)	51	51	0.06%	0.06%
Agricultural area (AA) (thousand ha)	1 840	1 776	0.06%	0.06%
			All countries[1]	
Population density (inhabitants/km^2)	78	100	53	63
GDP per capita (USD in PPPs)	7 838	21 032	9 281	20 929
Trade as % of GDP	38	21	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	10.2	4.5	2.9	4.9
Agriculture share in employment (%)	16.3	11.9	-	-
Agro-food exports (% of total exports)	31.0	40.4	6.2	8.5
Agro-food imports (% of total imports)	7.6	14.2	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	74	71	-	-
Livestock in total agricultural production (%)	26	29	-	-
Share of arable land in AA (%)	11	14	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

In 2021, GDP growth rebounded to 5%, after GDP contracted by 4% in 2020 due to the COVID-19 pandemic. Inflation has significantly declined since 2008, and has fluctuated between zero and 2% since 2015. Unemployment has increased in recent years reaching 17% in 2021 (Figure 11.5).

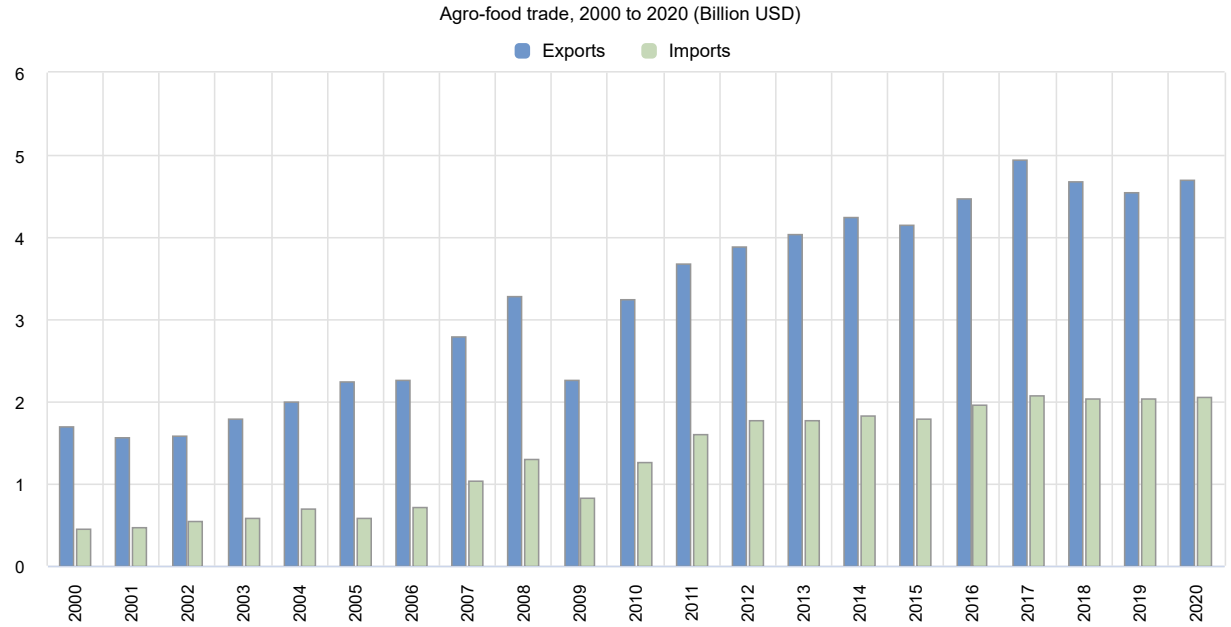
Costa Rica has developed a successful and dynamic agricultural export sector. The country is a net agro-food exporter, with a share of agro-food exports in total exports of 40.4% in 2020. Around 50% of Costa Rica's agricultural exports are primary crops for final consumption, such as bananas and pineapples (Figure 11.6). The country is also an important exporter of processed products for final consumption (31%) in 2020. Around half (47%) of agro-food imports are processed products for final consumption.

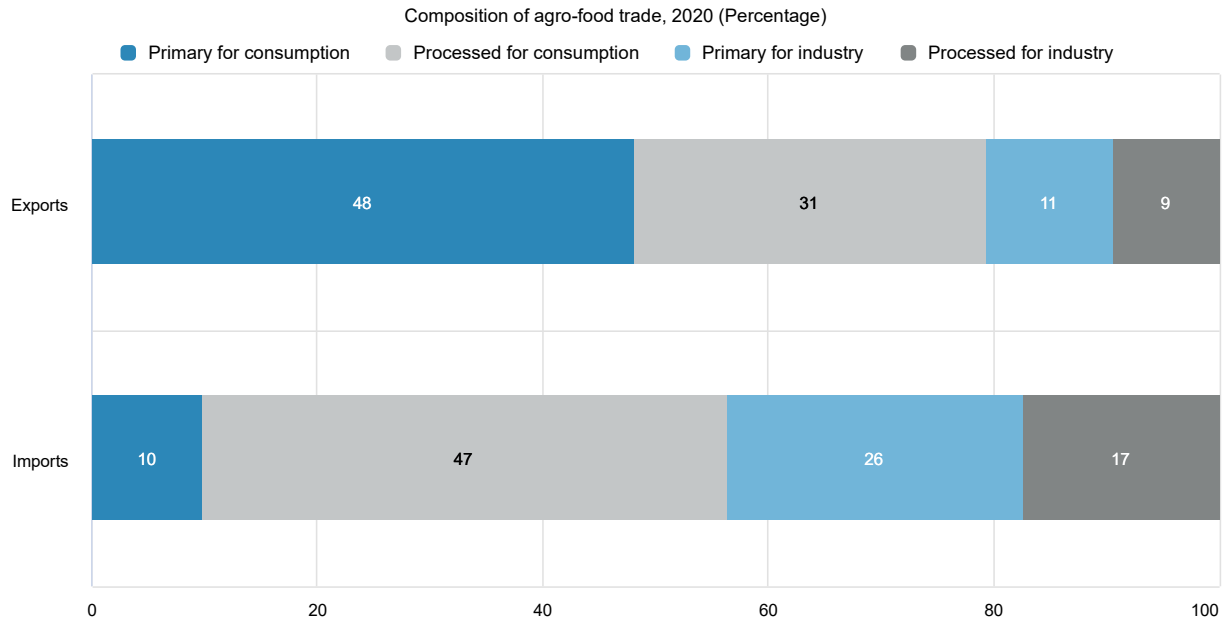
Figure 11.5. Costa Rica: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 11.6. Costa Rica: Agro-food trade

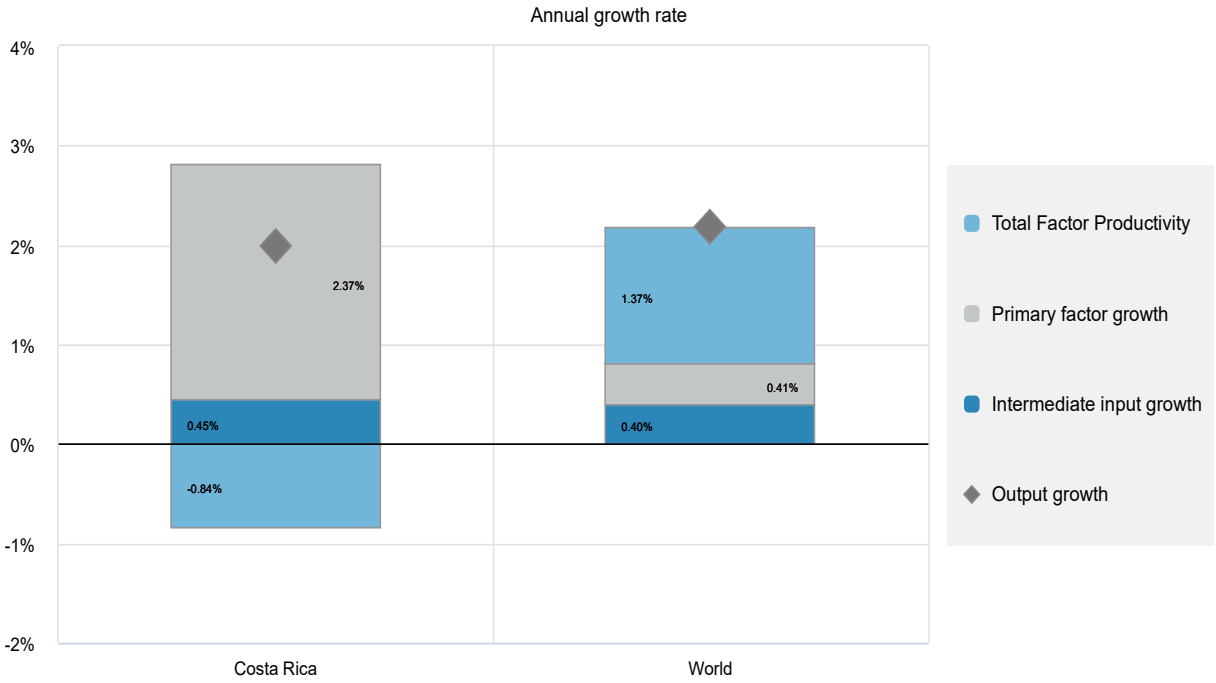




Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Average Total Factor Productivity (TFP) growth was negative during 2010-19. Nonetheless, increasing use of primary factors and, to a lesser extent, variable inputs, have resulted in output growth of 2% p.a., almost in par with the global average. (Figure 11.7). Area expansion into less productive land, ongoing farm fragmentation and limited financial and physical infrastructure were among the key contributing factors to the TFP decline. Agriculture is the main user of water resources. Environmental regulations have led to the reforestation of large parts of the country, and 25% of Costa Rican territory is now under some form of stricter environmental protection. However, the country continues to have relatively high nutrient balances for nitrogen and phosphorus, and agriculture contributes with 20.5% of total GHG emissions (Table 11.4).

Figure 11.7. Costa Rica: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 11.4. Costa Rica: Productivity and environmental indicators

	Costa Rica		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.8%	-0.8%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	36.0	40.8	32.1	30.0
Phosphorus balance, kg/ha	12.1	9.1	3.4	2.9
Agriculture share of total energy use (%)	6.6	1.9	1.7	2.0
Agriculture share of GHG emissions (%)	29.2	20.5	8.6	9.7
Share of irrigated land in AA (%)	5.3	9.0	-	-
Share of agriculture in water abstractions (%)	32.5	68.6	46.3	43.7
Water stress indicator	0.1	2.6	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

Anderson, K. and A. Valdés (2008), *Distortions to Agricultural Incentives in Latin America*, World Bank, Washington DC, https://openknowledge.worldbank.org/handle/10986/6604. [1]

OECD (2017), *Agricultural Policies in Costa Rica*, OECD Publishing, Paris, https://doi.org/10.1787/9789264269125-en. [2]

12 European Union

Support to agriculture

Producer support in the European Union (EU), measured by the Producer Support Estimate (PSE), is close to the OECD average. After falling from the 1990s through the early 2000s, EU support to producers as a share of gross farm receipts stabilised since 2010 and stood at 19% in 2019-21.

While trade protection measures, including import and export licensing, tariff rate quotas (TRQs) and special safeguards remain in effect for several sectors, support in the form of price distortions declined substantially over the last two decades. In 2019-21, market price support (MPS) accounted for 18% of support to producers, down from 46% in 2000-02.

Most support to producers is budgetary, largely in the form of decoupled direct payments. Policy reforms undertaken over the past three decades substantially reduced the level of support to the sector and shifted the composition of support to less production and trade-distorting measures. As of 2021, nearly half of budgetary support is based on historical entitlements, while one-third is based on current production and 17% on input use. Moreover, 54% of payments to producers are contingent on mandatory environmental constraints and an additional 14% come from voluntary agri-environmental schemes with conditions beyond the mandatory requirements.

Expenditures for general services to the sector (GSSE) in 2019-21 averaged 12% of total support, or 3% of the value of agricultural production – a decrease compared to 2000-02 and below the OECD average. While the relative importance of GSSE slightly declined over the past two decades, the composition of GSSE expenditures shifted. Expenditure on agricultural knowledge and innovation systems grew nine percentage points to 51% of total expenditures in 2019-21. Expenditures on marketing and promotion also rose (now responsible for 25% of GSSE), while support for development and maintenance of infrastructure and public stockholding remained static in absolute terms since 2000-02.

Total support to the sector declined in relative terms over the past 20 years. In 2019-21, total support was estimated at 0.7% of GDP, compared to 1.0% in 2000-02.

Recent policy changes

The COVID-19 pandemic was the focus of much agricultural policy activity in 2021, though emphasis shifted from emergency responses to financial recovery. On 28 January 2021, the EU decided to prolong the State Aid Temporary Framework adopted on 19 March 2020 until 31 December 2021, to support the economy in the context of the coronavirus outbreak. Member States utilised this option to provide policy support packages for their most affected sectors. The European Commission (EC) adopted exceptional measures to support the wine, fruit and vegetable sectors, including increasing support for risk management tools such as harvest insurance and mutual funds, and extending the flexibility measures until 15 October 2022.

Preparations for the next Common Agricultural Policy (CAP) programming period (2023-27) continued in 2021. In January, the EC published a list of potential agricultural practices that the eco-schemes could support in the future common CAP, and in May the Commission released its recommendations for Member States. The reform for a "fairer, greener, more animal friendly and more flexible CAP" passed European Parliament approval and was adopted by the Council in December 2021.

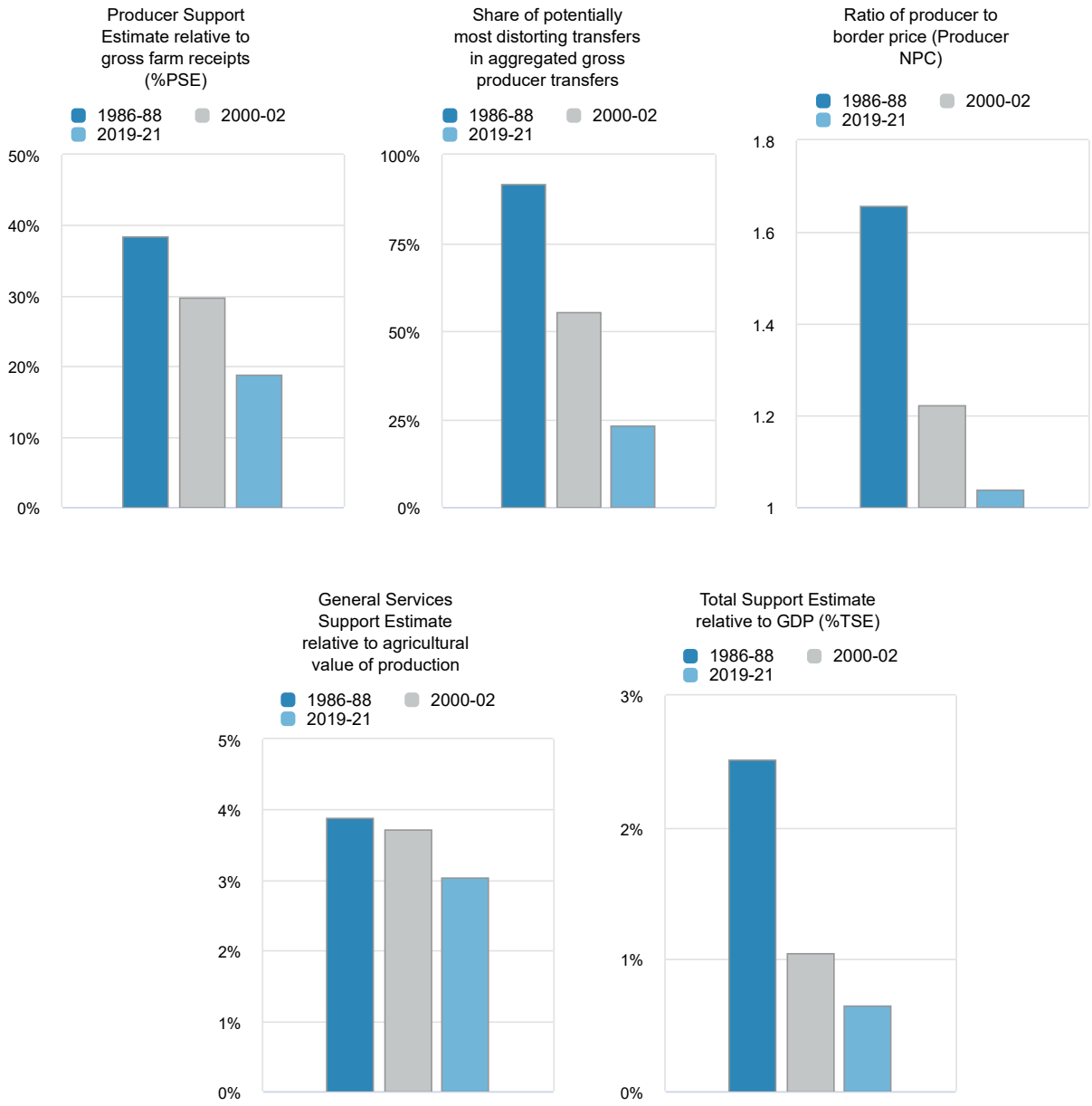
In July 2021, the European Commission adopted a package of proposals to make climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas (GHG) emissions at least 55% compared to 1990 levels by 2030. This was a significant increase in ambition from the EU's first Nationally Determined Contribution (NDC) target of at least 40% and this package will target increased mitigation from land use. Several Member States, including Belgium, Denmark, Germany, Portugal and Ireland, announced national climate action plans in 2021, which included ambitious sectoral GHG emission targets ranging from 11% to 55% absolute emission reductions[1] by 2030 for their agricultural sectors. Member States consider the reformed CAP as the main vehicle to support these ambitions.

The EU-UK Trade and Cooperation Agreement entered into force on 1 May 2021 after approval by the European Parliament and adoption by the Council. Free Trade Agreements are still under negotiation with Australia, the People's Republic of China (hereafter "China"), Indonesia, New Zealand and the Philippines.

Assessment and recommendations

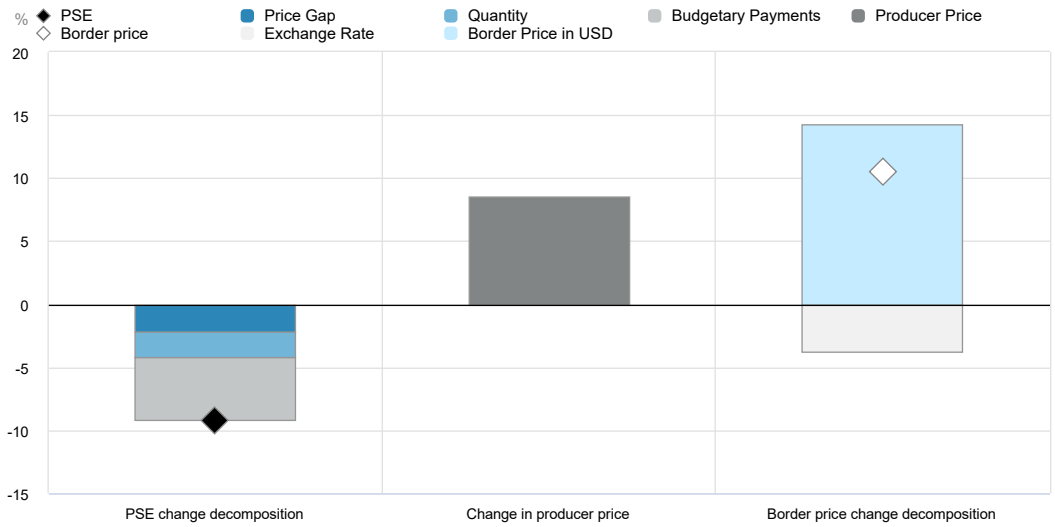
- Despite a large part of its budget earmarked for climate action, the current CAP programme has not seen significant reductions in EU agricultural emissions in the last decade. For agriculture to contribute to the 'EU Fit for 55' objectives, future EU CAP climate expenditure should link to agricultural emission reduction targets at national and EU level. The new carbon farming initiative and increased focus on emission hotspots (such as peatlands) is a positive step in this regard.
- Policy reforms over the past three decades substantially reduced the level of support to the sector and shifted the composition to less production and trade-distorting measures. Despite substantial progress reforming support for the sector, significant support continues for some products – particularly for beef and veal, poultry meat and rice. Potentially most-distorting forms of support still represent nearly a quarter of support to producers. It is recommended that funding for such supports be repurposed towards the European Green Deal objectives.
- Agricultural productivity growth in the European Union remains low. While some of this can be attributed to strict EU and national environmental regulations, regulations also limit the use of some agricultural innovations. The policy focus on innovation is a positive development, and progress in the use of sustainably productive technologies and continued increase in GSSE innovation expenditures could increase EU productivity and also contribute to environmental objectives.
- Two positive resilience developments were noted in 2021. The EC published a contingency plan in late 2021 to ensure food supply and food security in times of crisis. This European Food-Security Crisis-Preparedness and Response Mechanism (EFSCM) has rendered itself useful in light of the challenges posed by the post COVID-19 pandemic phase and Russian aggression against Ukraine. The EU also updated its climate adaptation strategy, for which agriculture is a key sector. However numerous ad hoc assistance packages announced under the Temporary Framework for State Aid indicate that either the current risk management policy toolbox is not appropriate for dealing with catastrophic events or the incentives to take up existing tools are misaligned. The new national CAP strategic plans provide an opportunity for policy makers to address these shortcomings.

Figure 12.1. European Union: Development of support to agriculture



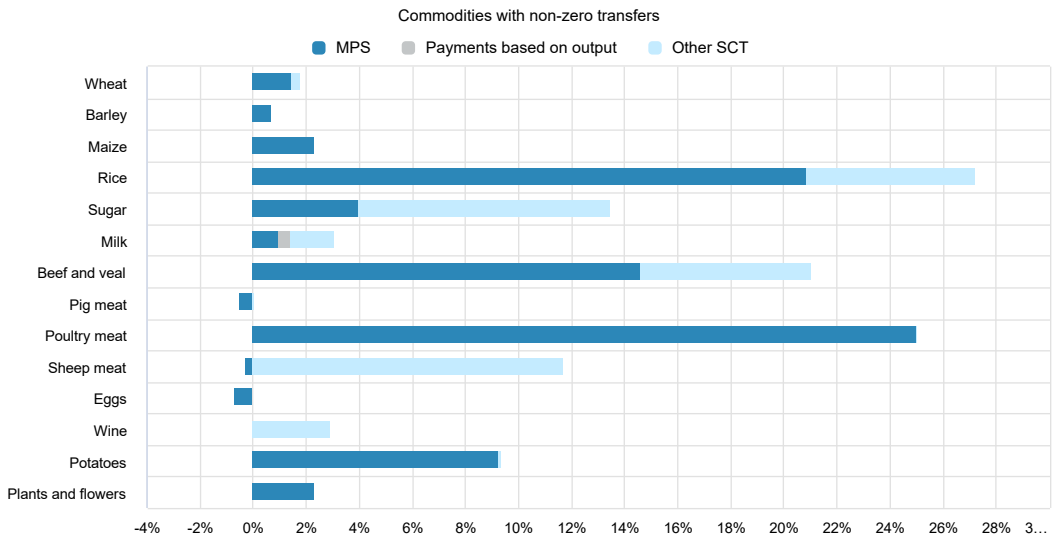
Note: EU12 for 1986-88, EU15 for 2000-02, EU28 for 2018-19, EU27 plus UK for 2020 and EU27 for 2021.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 12.2. European Union: Drivers of the change in PSE, 2020 to 2021



Note: EU27 plus UK for 2020 and EU27 for 2021
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 12.3. European Union: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Note: EU28 for 2019, EU27 plus UK for 2020 and EU27 for 2021.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 12.1. European Union: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**233 558**	**225 093**	**459 321**	**452 697**	**452 748**	**472 519**
***of which:** share of MPS commodities (%)*	74.95	73.34	73.25	73.62	72.98	73.14
Total value of consumption (at farm gate)	**212 900**	**226 789**	**447 815**	**435 556**	**445 464**	**462 425**
Producer Support Estimate (PSE)	**95 385**	**79 781**	**102 362**	**105 117**	**103 988**	**97 980**
Support based on commodity output	86 308	40 997	16 703	20 160	16 901	13 047
Market Price Support[1]	80 672	37 067	16 398	19 864	16 601	12 727
Positive Market Price Support	81 784	37 067	16 746	20 268	16 601	13 369
Negative Market Price Support	-1 112	0	-348	-403	0	-642
Payments based on output	5 637	3 930	305	296	300	320
Payments based on input use	5 056	6 833	15 323	14 606	15 180	16 182
Based on variable input use	960	3 047	6 433	6 315	6 675	6 310
with input constraints	0	0	49	42	38	66
Based on fixed capital formation	2 986	2 259	5 697	6 078	5 756	5 259
with input constraints	0	94	76	66	68	95
Based on on-farm services	1 109	1 527	3 192	2 213	2 749	4 614
with input constraints	90	274	11	10	10	14
Payments based on current A/An/R/I, production required	3 587	31 196	28 398	27 699	29 387	28 106
Based on Receipts / Income	147	99	1 131	763	1 401	1 230
Based on Area planted / Animal numbers	3 440	31 097	27 267	26 936	27 987	26 877
with input constraints	940	13 953	22 251	21 738	22 753	22 262
Payments based on non-current A/An/R/I, production required	0	0	7	3	7	12
Payments based on non-current A/An/R/I, production not required	0	10	40 371	41 224	41 006	38 884
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	10	40 371	41 224	41 006	38 884
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	478	1 078	1 266	1 163	1 178	1 457
Based on long-term resource retirement	476	846	252	161	153	440
Based on a specific non-commodity output	2	176	934	952	921	928
Based on other non-commodity criteria	0	57	81	50	103	89
Miscellaneous payments	-43	-334	294	261	329	291
Percentage PSE (%)	**38.43**	**29.77**	**18.79**	**19.54**	**19.25**	**17.57**
Producer NPC (coeff.)	**1.66**	**1.22**	**1.04**	**1.05**	**1.04**	**1.03**
Producer NAC (coeff.)	**1.62**	**1.42**	**1.23**	**1.24**	**1.24**	**1.21**
General Services Support Estimate (GSSE)	**9 118**	**8 355**	**13 990**	**12 783**	**14 676**	**14 511**
Agricultural knowledge and innovation system	1 788	3 492	7 166	6 941	6 831	7 725
Inspection and control	194	281	1 265	1 249	1 334	1 211
Development and maintenance of infrastructure	1 331	2 222	2 072	1 864	2 083	2 270
Marketing and promotion	1 210	996	3 444	2 695	4 374	3 263
Cost of public stockholding	4 571	1 294	26	20	37	19
Miscellaneous	24	69	18	15	16	22
Percentage GSSE (% of TSE)	**8.29**	**9.12**	**11.97**	**10.82**	**12.32**	**12.85**
Consumer Support Estimate (CSE)	**-69 408**	**-33 000**	**-15 100**	**-18 524**	**-14 677**	**-12 100**
Transfers to producers from consumers	-80 268	-36 084	-15 767	-19 172	-15 036	-13 092
Other transfers from consumers	-1 699	-717	-276	-265	-128	-436
Transfers to consumers from taxpayers	4 992	3 537	401	286	488	428
Excess feed cost	7 567	264	542	626	0	1 000
Percentage CSE (%)	**-33.38**	**-14.75**	**-3.39**	**-4.26**	**-3.30**	**-2.62**
Consumer NPC (coeff.)	**1.63**	**1.19**	**1.04**	**1.05**	**1.04**	**1.03**
Consumer NAC (coeff.)	**1.50**	**1.17**	**1.04**	**1.04**	**1.03**	**1.03**
Total Support Estimate (TSE)	**109 495**	**91 672**	**116 752**	**118 186**	**119 152**	**112 919**
Transfers from consumers	81 967	36 801	16 043	19 436	15 164	13 528
Transfers from taxpayers	29 228	55 589	100 985	99 014	104 115	99 827
Budget revenues	-1 699	-717	-276	-265	-128	-436
Percentage TSE (% of GDP)	**2.51**	**1.04**	**0.65**	**0.64**	**0.66**	**0.67**
Total Budgetary Support Estimate (TBSE)	**28 824**	**54 606**	**100 355**	**98 322**	**102 551**	**100 192**
Percentage TBSE (% of GDP)	**0.66**	**0.62**	**0.56**	**0.53**	**0.57**	**0.59**
GDP deflator (1986-88=100)	**100**	**152**	**197**	**193**	**201**	**..**
Exchange rate (national currency per USD)	**0.91**	**1.09**	**0.87**	**0.89**	**0.88**	**0.85**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
EU12 for 1986-88; EU15 for 2000-02; EU28 for 2019; and EU27 and the United Kingdom for 2020; and EU27 from 2021.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for the European Union are: wheat, maize, barley, oats, rice, rapeseed, sunflower, soybean, sugar, milk, beef and veal, sheep meat, pig meat, poultry, eggs, potatoes, tomatoes, plants and flowers, and wine.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

The CAP has been the European Union's agricultural policy framework since its institution in 1962, although the mix of policy instruments has evolved substantially over time (Table 12.2). The Treaty of Rome that established the European Community outlined the CAP in 1957 (OECD, 2011[1]; European Parliament, 2021[2]). Agriculture made up a much larger share of Europe's economy at the time, and the income gap between rural and urban households was increasing. Moreover, the region was a net food importer with concerns about securing adequate food supplies during the Cold War (Grant, 2020[3]). In this context, the Treaty of Rome laid down five main objectives for the CAP:

1. To increase agricultural productivity by promoting technical progress and ensuring the optimum use of the factors of production, in particular labour
2. To ensure a fair standard of living for farmers
3. To stabilise markets
4. To assure the availability of supplies
5. To ensure reasonable prices for consumers

Measures targeting these objectives were financed from the European Agricultural Guidance and Guarantee Fund (EAGGF), split into separate Guidance and Guarantee sections. Different rules governed the two: the Guidance section financed operations related to structural policy and development of rural areas, while the Guarantee section funded expenditures on market and price policies (European Parliament, 2021[4]).

From the CAP's institution until the 1990s, support prices were high compared to world market prices. Combined with an unlimited buying guarantee, European farmers produced increasing surpluses. The cost of these policies was large, however, such that by the 1980s the European Union introduced quantitative production restrictions in the form of quotas on milk production.

The CAP's first major reform occurred in 1992, in conjunction with negotiations on the General Agreement on Tariffs and Trade (GATT) and following the result from the US-EU soya panel. The **MacSharry Reform** brought a major shift in how the public sector delivered support to agriculture. Instead of supporting production (through intervention buying and export subsidies), the regime shifted to supporting producer incomes directly, to close the gap between supply and demand, and reduce overall expenditures (European Parliament, 2021[5]). This wide-ranging reform included reducing cereal intervention prices, introduced compensatory payments per hectare for cereals or per head for livestock, and introduced a mandatory set-aside scheme to take land out of production. In conjunction with the reform of budgetary support measures through the MacSharry package, MPS also declined thanks to EU commitments under the 1995 Uruguay Round Agreement on Agriculture. Namely, bound tariffs were gradually reduced, and other border measures were imposed (including replacing variable import levies with *ad valorem* or specific tariffs and tariff rate quotas) (OECD, 2011[1]).

Subsequent reforms built on the foundation of the MacSharry Reform, reducing distortive support to the agricultural sector or changing how support is delivered. The **Agenda 2000** reform focused on aligning EU and world prices, offsetting the reduction of price support with increased direct aid to producers (European Parliament, 2021[5]). In addition, the Rural Development Regulation was introduced as Pillar 2 of the CAP. Finally, this package instituted the first environmental cross-compliance conditions for granting aid.

The 2003 **Fischler Reform**[2] further developed and consolidated these measures. It saw the introduction of the single payment scheme (SPS), decoupling most support from production (European Parliament, 2021[5]). Furthermore, receiving the full payment required cross-compliance related to the environment, animal welfare, plant protection and food safety. This package also introduced modulation, allowing

Member States to transfer funds between the two pillars to reinforce rural development objectives. The reform also prioritised financial discipline, freezing the budget of Pillar 1 and imposing annual compulsory ceilings. This coincided with the splitting of the budget into the European Agricultural Guarantee Fund (EAGF) to finance Pillar 1 and the European Agricultural Fund for Rural Development (EAFRD) to finance Pillar 2 from 2007. Additionally, this round of reform introduced the single common market organisation (CMO) in 2007, which codified the regulation mechanisms of the existing CMOs. Reform programmes for specific commodities (cotton, hops, olive oil, tobacco, sugar, fruits and vegetables, and wine) were introduced from 2003 to 2008, with the aim of reducing distortive payments and restoring market-based incentives (OECD, 2011[1]).

Measures taken under the 2009 **Health Check** sought to continue the direction of the 2003 reform. Namely, decoupling of aid continued and nearly all payments (with the exception of suckler cow, sheep and goat premia) were included into the decoupled direct payments - SPS. It also further reduced market intervention for a number of products, abolished set-aside and introduced phase-out of milk quotas. Additional flexibility for direct payments was introduced as well (OECD, 2011[1]).

The **2013 Reform** set out a more global, integrated approach to agricultural support, undertaken through four lines of action (European Parliament, 2021[5]):

1. Converting decoupled aid into a multifunctional support system with aid directed toward specific objectives. Accordingly, the SPS was replaced by a system of decoupled payments with seven components: (1) a basic payment; (2) a greening payment for environmental public goods; (3) an additional payment for young farmers; (4) a 'redistributive' payment for first hectares of farmland; (5) support for areas with specific natural constraints; (6) aid coupled to production; and (7) a simplified system for small farmers.
2. Consolidating the two CAP pillars, with mostly decoupled direct aid and market measures funded through Pillar 1, and rural development funded through Pillar 2 and co-financed by the Member States.
3. Consolidating CMO tools into safety nets in case of market disruption or price crisis, and ending other supply control measures, namely the sugar and milk quotas.
4. A more integrated, targeted and territorial approach to rural development, including simplifying the range of available instruments to focus on certain core objectives.

Political agreement between the European Parliament and the EU Member States in the Council was reached on **transitional rules for the CAP for 2021-22** on 27 November 2020. These transitional rules are based on the principle of continuity of the 2014-20 CAP rules, while also including new elements to ensure a smooth transition. From 2023-27, although with a similar annual budget as the transitional period, the current Pillar 1 and Pillar 2 system will be included in Member States' national CAP strategic plans (covered later in the chapter).

All told, through the rounds of CAP reform, the absolute budget figure for the CAP more than doubled from 1990 to 2010 (partially related to additional Member States joining the European Union), it has remained relatively stable in absolute terms since then. At the same time, CAP expenditures as a share of the total EU budget declined sharply, from 65.5% in 1980 to 35% in 2020 (EC, 2021[6]).

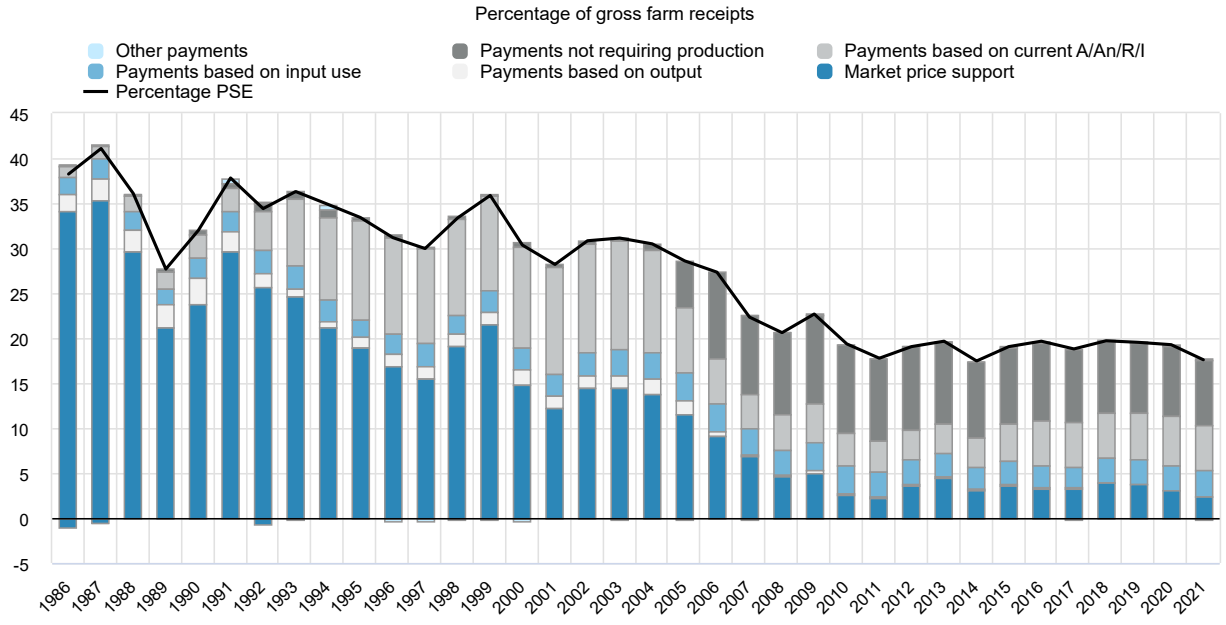
Table 12.2. European Union: Agricultural policy trends

Years	Main Milestones	Key Policy Features
pre-1992	**Coupled support phase**: CAP financed by the European Agricultural Guidance and Guarantee Fund (EAGGF), European Union expansion to 15 members	Support prices greater than world prices Unlimited buying guarantee Production quotas for certain products, including dairy and sugar
1992-1999	**MacSharry Reform**: CAP, EU Expansion 1995 (Austria, Finland, Sweden), Uruguay Round Agreement on Agriculture	Shift from product support through prices to producer support through income-supporting measures, with the reduction in intervention prices compensated by increased direct aid per hectare or livestock headage payments Establishment of set-aside payments to encourage land retirement Tarrification of border measures and gradual reductions in bound tariffs
2000-2002	**Agenda 2000 CAP Reform**: CAP divided into Pillar 1 and Pillar 2 (Rural Development)	Further reduction of EU market support prices in closer alignment with world prices, partly offset by direct aid to producers in the form of increased area or headage payments First introduction of compulsory environmental cross-compliance Introduction of Rural Development Regulation as a second pillar of the CAP
2003-2008	**Fischler Reform**: CAP Pillars 1 (financed by EAGF) and 2 (financed by the European Agricultural Fund for Rural Development EAFRD), EU Expansion 2004 (Malta, Cyprus[1], Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Slovenia, Hungary) and 2007 (Bulgaria and Romania)	Decoupling much of CAP support from volume of production, with fixed single farm payment (SPS) introduced based on historical references Cross-compliance for environmental and public health objectives compulsory for receiving full payments Single common market organisation (CMO) introduced Reform programmes initiated for cotton, hops, olive oil, tobacco, sugar, fruit and vegetable and wine regimes
2009-2013	**Health Check**: CAP Pillars 1 and 2	Further reduction of EU market intervention for certain products Phasing out of milk quotas initiated Abolition of set-aside Integration of nearly all payments into SPS New cross-compliance requirements introduced
2013-present	**2013 Reform**: CAP Pillars 1 and 2, EU Expansion 2013 (Croatia) and Contraction 2020 (United Kingdom)	Decoupled aid converted to multifunctional support (including basic payment, greening payment, small farmer payment, etc.) Consolidation of two pillars of CAP, with direct payments and market measures under Pillar 1 Consolidation of CMO tools, abolition of supply control measures (including ending milk and sugar quota schemes) External and internal convergence, with payment envelopes gradually adjusted to move toward a uniform minimum per hectare payment
2021-2022	**Transitional rules**	Continuity of the 2014-2020 CAP rules, while also including new elements to ensure a smooth transition

Source: (European Parliament, 2021[5]); (OECD, 2011[1]).

Total support to the agricultural sector as percentage of agricultural gross value-added in the European Union largely comes from budgetary allocations. Market price support declined significantly from 1986 through the 2000s, but remains mostly unchanged since around 2010. The most substantial change to PSE composition began in the mid-2000s after the Fischler reform decoupled most payments to farmers from production (Figure 12.4).

Figure 12.4. European Union: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The **Common Agricultural Policy** is the agricultural policy framework of the European Union. In addition to the CAP, Member States may implement measures funded from national or sub-national budgets that target specific sectors (including agriculture) or objectives, as long as they comply with the European Union's state aid rules and do not distort competition within the common market (OECD, 2017[7]).

The CAP typically covers a seven-year period – currently 2014-20, but extended to the end of 2022 with the passage of transitional CAP rules in 2020. It comprises two pillars: the European Agricultural Guarantee Fund finances Pillar 1, and measures under Pillar 2 are based on Rural Development Programmes (RDP) co-financed by the European Agricultural Fund for Rural Development and EU Member States.[3] Member States deploy RDPs over the seven-year CAP period. The CAP 2014-20, while in many ways the continuation of the CAP 2007-13, offered a number of novel features (OECD, 2017[7]).

The implementation of the CAP 2014-20 started with measures under Pillar 1, followed in 2016 by implementation in the Member States of 114 national and regional Pillar 2 RDPs.[4] In 2018, the CAP simplification took place within the revision of the EU financial rules, also known as the Omnibus regulation (OECD, 2018[8]).

The overall budget for the CAP during the years 2014-20 was EUR 408 billion (USD 465 billion), of which 76% was initially allocated to Pillar 1 (covering market related expenditure and direct payments), and the remaining 24% to Pillar 2 (rural development spending, including agri-environmental payments). The CAP 2014-20 allows Member States to transfer up to 15% of each envelope[5] between the two pillars. As of December 2018, twelve transferred funds from Pillar 1 to Pillar 2 while five transferred funds from Pillar 2

to Pillar 1, with a net result of EUR 3.76 billion (USD 4.28 billion), or less than 1% of expenditures transferred from Pillar 1 to Pillar 2 over the period (EC, 2020[9]).[6]

Pillar 1 defines and funds **market measures** under the common market organisation, as well as **direct payments** – mostly decoupled per hectare payments that do not require production (see next paragraph), but also payments to a few specific sectors, such as fruits and vegetables. To this end, for the entire period of the CAP 2014-20, entitlements to direct payments were assessed and allocated to those deemed to be active farmers.

The Basic Payment Scheme (**BPS**) and the Single Area Payment Scheme (**SAPS**) – the BPS equivalent that offers a uniform decoupled per hectare payment rate in all but three Member States that joined the European Union after 2000[7] – made up 46% of the EU Pillar 1 direct payments envelope in Budget Year 2021 (Table 12.3). However the proportion spent by member States on these two schemes varies significantly, and reflects their spending choices on optional measures under Pillar 1. Both the BPS and the SAPS require cross-compliance with environmental and other standards, though exceptions apply. Additional conditions are attached to the per-hectare **Greening** payment that accounts for 27% of the Pillar 1 direct payments budget. As of 2017, farmers who do not comply with all the requirements of greening may be subject to new greening administrative penalties (equivalent to 20% of the farmer's greening payment in 2017, rising to 25% from 2018 onward) in addition to forfeiting a share of the greening payment on the non-compliant area.

Table 12.3. Direct payments budget under Pillar 1, 2021

	Budget 2022 (EUR million)	Share in direct payments	Share in decoupled direct payments
Direct payments; of which:	40 389		
Decoupled direct payments, of which:	31 578	78%	
Basic Payment Scheme (BPS)	14 260	35%	45%
Single Area Payment Scheme (SAPS)	4 392	11%	14%
Greening	10 776	27%	34%
Voluntary Coupled Support	4 011	10%	

Note: Other decoupled payments represent about 7% of direct payments under Pillar 1. The 2022 EU fiscal year (November to October) is attributed to year 2021 in the PSE system.
Source: OECD calculations based on European Commission, EUR-Lex budget 2022.

In the ten Member States that apply the SAPS, commodity-specific payments may be granted from national budgets within limited envelopes. **Transitional National Aid** (TNA) is mostly disbursed as decoupled payments. In claim year 2019 (the most recent year for which these data are available), only 15% of TNA was paid as coupled support (EC, 2020[10]). It may apply on a per area basis to arable land, hops and starch potatoes; a volume basis to milk; and a headage basis to livestock. Member States may review TNA budgets and supported commodities on an annual basis. The maximum TNA payments allowed decreased gradually from 75% of the 2013 level of SAPS aid in 2015 to 50% in 2021.

As the CAP 2014-20 is implemented, the gap in per hectare payment rates of the BPS and the SAPS will narrow, both between countries (**external convergence**) and between farmers and regions within countries (**internal convergence**[8]). Internal convergence applies to BPS when a flat rate is not yet applied, while under the SAPS a uniform payment rate at national level already applies to each hectare.

In the CAP 2014-20, Member States may choose to allocate part of their direct payments envelope to commodity-specific payments within defined ceilings (up to 13%) and under defined conditions. The **voluntary coupled support** (VCS) expands the coupled support scheme under Article 68 of the previous CAP 2007-13, and lets Member States allocate a larger envelope to more sectors or regions and under a

wider set of specific conditions. Such support may be granted to create an incentive to maintain current levels of production in the sectors or regions concerned. Choices of Member States on take-up of the VCS vary greatly, both in terms of the level of support and the commodities supported. On several occasions, Member States reviewed VCS budgets and commodity attributions, making some minor adjustments. All except Germany chose to offer VCS, using 10% of the EU direct payments budget on average during the 2019-21 period. This compares to 3% spent previously under Article 68 coupled support, as reported in the EU general budgets.

A top-up **payment to young farmers** in addition to the BPS and SAPS applies in all Member States. In 2021, this payment accounted for 1.3% of the European Union's direct payments envelope, as reported in the general budget. Member States have chosen to implement this measure in different ways. Some offer recipients a flat payment rate on a limited number of hectares, while others apply a payment proportional to the BPS or SAPS received. In addition to this compulsory young farmer scheme, 25 Member States chose to attribute a portion of their rural development envelopes to support young farmers, representing 4.5% of total planned rural development expenditures (ENRD, 2016[11]). The bulk of this spending is directed toward business development and investments.

Fifteen Member States chose to offer small farms simplified payment attribution conditions – the Small Farmers Scheme – that waives requirements attached to the greening payment and cross-compliance. The payment cannot exceed EUR 1 250 (USD 1 424) per farm and, depending on the method chosen by the Member State, the overall envelope may be limited to 10% of national direct payments.[9]

Denmark and Slovenia implement the Pillar 1 direct payment to **Areas with Natural Constraints** (ANC). Under this payment, ANC are defined based on eight biophysical criteria.[10] Denmark uses 0.3% and Slovenia 1.6% of their national direct payments envelope for ANC payments (EC, 2019[12]). A payment targeted to areas with natural or other specific constraints can also be budgeted under the RDP, labelled as the Less Favoured Areas payment in the previous CAP. It is implemented in 25 Member States and accounts for 19% of Pillar 2 public expenditure funds (including Member States' contributions from national budgets) in 2021. In the past, Member States used up to 140 different criteria for assessing ANC status for Pillar 2 payments. However, these were consolidated into the same eight biophysical criteria that apply to Pillar 1 ANC payments.

Nine Member States or regions have chosen to grant higher payments to the first hectares[11] under the so called **redistributive payment**, using 4% of the European Union's direct payments envelope, as reported in European Union's 2021 general budget.

Member States that implement the redistributive payment may opt-out of so-called "degressivity" and six Member States and regions did so.[12] Under **degressivity**, BPS amounts above EUR 150 000 (USD 170 932) per recipient are reduced by a minimum of 5%. Funds deducted under this provision are transferred to Pillar 2 and used to fund the member state's RDPs. Fourteen[13] applied the minimum reduction. Ten Member States used the option to increase the amount exempt from the 5% reduction by the value of salaries paid. A further ten Member States have chosen to apply a full cap on the BPS at levels varying from EUR 150 000 (USD 170 932) to EUR 600 000 (USD 683 728).

A **Crisis reserve** is earmarked to be used in case of emergency. It is funded from the Pillar 1 direct payments budget. If unused, the envelope reverts for distribution as Pillar 1 direct payments in the same year. The crisis reserve is renewed each year and to date has never been used as an emergency fund.

The **POSEI scheme** (*Programmes d'Options Spécifiques à l'Eloignement et à l'Insularité*) supports farming in the European Union's outermost regions by using production-related payments. The scheme supports access to food, feed and inputs for local communities, and the development of local agricultural production with 1% of the direct payments envelope in 2021.

Pillar 1 also funds measures that support **commodity markets**, representing 4.7% of the overall agriculture and rural development budget in 2021. Prices paid to EU domestic producers averaged 4% above world market prices in 2019-21.

While the possibility for public intervention for cereals (namely common and durum wheat, barley, and maize) exists, the last intakes of cereals into public storage occurred during the 2009/10 marketing year (EC, 2013[13]). Purchase at the cereal intervention price is limited to 3 million tonnes of common wheat, beyond which purchase is by tender. Public intervention for durum wheat, barley, maize and paddy rice can be opened under special circumstances by means of tendering. Public intervention also applies to paddy rice. Until 30 September 2017, sugar was supported with production quotas, coupled with a minimum price for sugar beets. After the end of the sugar quota regime, provisions for agreements between sugar factories and growers were maintained, and white sugar remained eligible for private storage aid. The support regime for cereals and sugar also includes trade protection through tariffs and TRQs. No export refunds have been granted since July 2013. Furthermore, since the WTO Ministerial conference in Nairobi in December 2015, the European Union has committed not to utilise export subsidies. The possibility to grant export refunds has been completely abolished in the 2021 CAP Reform.

Fruits and vegetables are eligible for voluntary coupled support and commodity specific payments; they are also supported through various market measures mainly through Producer Organisations. These include crisis intervention measures that may be managed by producer organisations, an entry price system (minimum import price) for some products and ad valorem duties, but no export subsidies. Support co-financed by Member States also applies to the fruit and vegetables sector, and the olive oil and table olives sectors. These support a wide range of actions from production planning, quality measures, market withdrawal and harvest insurance to training, promotion and communication. Some measures apply at farm level while others are provided to producer organisations or the sector at large. For olive oil and flax fibre private storage may be activated as an optional scheme. In the CAP 2014-20, recognition of producer and inter-branch organisations expands beyond fruits and vegetables. Compensation may be greater when producers claim support via producer groups, as was the case with compensation payments related to the Russian Federation's embargo on imports.

Also targeting the fruit and vegetables sector, a consumer support system directed toward school children covers consumption of fresh fruits and vegetables, processed fruits and vegetables, and banana products. The scheme's budget grew rapidly from EUR 29 million (USD 33 million), when it was implemented in 2010, to EUR 117 million (USD 133 million) in 2016. A similar scheme supported milk consumption for schoolchildren, with a budget of EUR 64 million (USD 73 million) in 2016. In August 2017 both schemes merged under the title "School Schemes" and the budgets combined into EUR 216 million (USD 246 million) in 2021.

In the dairy sector, intervention prices are used for butter and skimmed milk powder (SMP), while import tariffs are applicable to all milk and dairy products Intervention purchases cannot exceed 50 000 tonnes for butter, and 109 000 tonnes for SMP, respectively representing 2% and 7% of production in 2021. Above those limits, purchase is made by tender. Intervention purchases were opened for both products as a response to sector shocks due to COVID-19, prior to which no intervention purchases were made for butter since 2009, while the last intervention purchases for SMP took place in 2018.

Floor prices,[14] tariffs and TRQs support the beef market. Import protection provides support for pig meat. The market support regime for sheep meat comprises tariffs and TRQs, with most country-specific TRQs subject to a zero customs duty. TRQs also support the poultry and eggs markets. Private storage may be activated as an optional scheme for butter, SMP, certain cheeses, beef, pig meat, sheep meat and goat meat. Indeed, private storage was opened for butter, SMP, cheese, beef and sheep meat in 2021 in response to the COVID-19 emergency (see Domestic policy responses to the COVID-19 pandemic). Furthermore, specific provisions are made for milk and milk products.

A system of authorisations for new vine planting support the wine sector. Since January 2016, new vine planting is limited to 1% of the planted vine areas per year. Authorisations would be automatically granted to producers to replace grubbing of an existing vine area. Member States had until 31 December 2020 to transition to the new system. The sector is also supported through promotional measures in both the European Union and third countries, restructuring and conversion of vineyards; compensation for green harvesting; setting up of mutual funds; investment in tangible and intangible capital; income insurance; development of new products, processes and technologies; and distillation of by-products.

Rural Development is part of the EU-level Common Strategic Framework covering all support from European Structural and Investment (ESI) funds[15] in Member States through partnership agreements. The EAFRD finances **Pillar 2** of the CAP 2014-20 to serve six priority areas: (1) fostering knowledge transfer and innovation; (2) enhancing competitiveness of all types of agriculture and the sustainable management of forests; (3) promoting food chain organisation, including processing and marketing, and risk management; (4) restoring, preserving and enhancing ecosystems; (5) promoting resource efficiency and the transition to a low-carbon economy; and (6) promoting social inclusion, poverty reduction and economic development in rural areas (Table 12.4). Pillar 2 funds are implemented through national (or regional) **RDPs**. RDPs also support projects that use the **LEADER** approach (*Liaison Entre Actions de Développement de l'Économie Rurale*) relying on a multi-sectoral approach and local partnerships to address specific local problems, and technical assistance for the implementation of Pillar 2 measures.

Table 12.4. CAP expenditure by source and use (estimated 2021)

CAP expenditure (EU funding), of which:	Share in EU funding:
Administrative expenditure	0.01%
Interventions in agricultural markets CMO	4.86%
Direct Payments	73.48%
Rural Development – EU funding	26.51%
Research and innovation – Horizon 2020	1.75%
Rural Development (total public expenditure) of which:	**Share in total public expenditure:**
Rural Development EU funding	66.8%
Rural Development national funding	33.2%
Priority 1: knowledge	*Allocated through other priorities*
Priority 2: competitiveness	20.9%
Priority 3: food chain organisations	9.6%
Priority 4: ecosystems	48.5%
Priority 5: resource efficiency	5.0%
Priority 6: social inclusion	13.6%

Source: OECD calculations based on European Commission, EUR-Lex budget 2022 (for EU funding) and EAFRD financial execution (for Rural Development and allocation to priorities). Total public expenditure comprises EU funding and Member States national funding of Rural Development.

The implementation of RDP 2014-20 was delayed, and by 2018 most payments for programmes within the RDP 2007-13 had terminated. At the same time, payments for farm restructuring under CAP 2007-13 were prolonged, including early retirement, conversion of arable land into grassland and afforestation of agricultural land.

Member States participate in the funding of Pillar 2 payments (also called co-financing) in accordance with RDPs that cover the entire duration of the CAP cycle. In their plans, Member States could choose from a menu of 19 measures to meet the six priority areas of Pillar 2.[16] Two conditions apply: (1) a minimum 30% of rural development funding from the EU budget must be spent on measures related to the environment

and climate change adaptation, including forestry and investments in physical assets; and (2) another 5% must be spent on the LEADER approach.

At the aggregate, the greatest share of the new RDP budget is allocated to three measures: Investments; Agri-environment and Climate; and Areas with Natural Constraints. While Member States' choices vary, investment is one of the top three measures, receiving the highest shares of expenditure for the period 2014-20 in the vast majority of Member States.

The launch of the European Innovation Partnership for Agricultural productivity and Sustainability (EIPAGRI) in 2012 was followed by integrating the Horizon 2020 programmes specific to research and innovation in agriculture into the CAP 2014-20. Horizon 2020 programmes relevant to agriculture focus on securing sufficient supplies of safe and high-quality food and other bio-based products. The Horizon 2020 budget under the agriculture and rural development title increased substantially since it was initiated in 2013, from EUR 1 million (USD 1.1 million) to EUR 257 million (USD 293 million) in 2019. A total of EUR 3.8 billion (USD 4.3 billion) is available for the period. Horizon 2020 was replaced by Horizon Europe for 2021-27, in which EUR 9 billion (USD 10.6 billion) of funds have been earmarked for sustainable food systems.

Programming for CAP 2014-20 ended in 2020. However, its structure remains in place for 2021-22 under transitional rules based on the principle of continuity while negotiations for the next CAP were concluded (see next section).

Box 12.1. The 2023-2027 CAP Reform period

The European Commission presented its proposal for the common agricultural policy (CAP) reform in 2018, introducing a new way of working to modernise and simplify the EU's policy on agriculture. Following extensive negotiations between the European Parliament, the Council of the European Union and the Commission, agreement was reached and the new CAP was formally adopted on 2 December 2021 (EC, 2021[14]). It is due to be implemented from 1 January 2023. The new CAP is based on a more flexible performance and results-based approach that takes into account local conditions and needs, while increasing the EU's ambitions in terms of sustainability, including social sustainability, which will be addressed through the new concept of social conditionality (i.e. farmer payments will be linked to compliance with certain labour laws). It is built around ten objectives, which are also the basis upon which EU Member States design their CAP strategic plans.

Member States will implement the new CAP with a CAP strategic plan at national level. Each plan will combine a wide range of targeted interventions, through decoupled direct payments addressing the specific needs of that Member State and deliver tangible results in relation to EU-level objectives, while contributing to the ambitions of the **European Green Deal** (EC, 2019[15]). Member States are required to produce a thorough assessment of what must be done, based on a strengths, weaknesses, opportunities and threats (SWOT) analysis of their territory and agri-food sector. Member States were given until 31 December 2021 to submit their national CAP strategic plans. Following this, the Commission has six months to approve the plans ahead of their implementation in January 2023. The approval process is based on the criteria laid down in the new **CAP strategic plan regulation** (EP, 2021[16])

The Commission will assess whether the Member States' CAP strategic plans contribute to, and are consistent with, EU legislation and commitments in relation to climate and the environment, including those laid out in the **Farm to Fork** (EC, 2020[17]) and **biodiversity strategies** (EC, 2020[18]).

The Commission provided each Member State with tailor-made recommendations, accompanied by a communication (EC, 2022[19]). These recommendations are to assist policy makers in the drafting of the

national CAP strategic plans by identifying the key areas on which each Member State should focus. Based on an analysis of their agricultural sector and rural areas, the recommendations aim to ensure:

- The achievement of the ten specific CAP objectives, touching upon environmental, social and economic challenges, as well as a cross-cutting objective on knowledge and innovation.
- The contribution to the Green Deal ambitions and more specifically six Farm to Fork and biodiversity strategy targets. These are quantified EU level targets on the use and risk of pesticides, sales of antimicrobials, nutrient loss, area under organic farming, high diversity landscape features and access to fast broadband internet. The Commission asks EU countries to determine specific national values for these targets and align their CAP strategic plans to them.

By early April 2022, all 27 EU Member States had submitted and published their National CAP strategic plans for the 2023-2027 period (EC, 2022[19]).

In addition to the CAP, the European Union's trade policy plays an important role in supporting the European agriculture sector, through the use of a number of measures (covered in more detail later in this chapter). The European Commission published a number of reports in 2021 on the impact of free trade agreement on the EU agri-food sector.[17] [18]

Climate change mitigation policies in agriculture

In July 2021, the EU adopted a package of proposals to make climate, energy, land use, transport and taxation policies fit for reducing net GHG emissions by at least 55% compared to 1990 levels by 2030 (EC, 2021[20]). This package is part of the EU's revised NDC.[19]

There are no sector-specific targets at EU level for emissions from agriculture. Mitigation efforts for non-CO_2 GHGs emitted by all sectors outside the ETS are covered under the EU's Effort Sharing Decision (ESD) (Decision No 406/2009/EC) and CO_2 emissions relating to forestry, wetlands, cropland and grassland management, addressed primarily under the Land Use, Land Use Change and Forestry (LULUCF) Decision (Decision No 529/2013/EU) to 2020. The LULUCF Decision provides guidance and accounting rules for Member States to complete their obligations. Member States report greenhouse gases emitted on their territory using activity data linked to sources of emissions (e.g. fertiliser usage, animal types and numbers) with the relevant emission factors.

Following the 2013 CAP reform, the "sustainable management of natural resources and climate action" is now one of the CAP's three objectives, which address climate under both pillars. Climate-friendly land use and management practices, including investment in climate action and capacity building are supported through a mix of mandatory and voluntary instruments.

Agriculture accounts for 10.5% of EU GHG emissions. Agricultural emissions[20] comprise methane (54%) and nitrous oxide (46%). Emissions from agriculture fell by more than 20% since 1990, although they remain largely unchanged since 2010, while agricultural production continues to grow.

In 2021, several Member States announced agricultural sectoral emission targets. *Belgium* announced a National Climate Framework to reduce GHG emissions, covering 2021-30. This framework includes a chapter on agricultural GHG emissions, which has a target of a 25% reduction in agriculture GHG emissions by 2030 (versus a 2005 baseline). *Ireland's* "The Climate Action Plan 2021" set a target to reduce overall national emissions 51% by 2030 and reach net-zero emissions no later than 2050. This includes a target of 22-30% reduction in agriculture emissions by 2030 compared to a 2018 baseline, and the measures and actions to achieve this reduction. On 4 October 2021, *Denmark* reached parliamentary agreement by a broad coalition of political parties on a green transition of the agricultural sector. The agreement contains a binding climate target for the agricultural and forestry sector of 55% to 65% CO_2eq

emissions reduction compared to 1990 by 2030. In June 2021, *Germany's* parliament passed a revised Climate Change Act with a target of 31-34% reduction in agricultural GHG emissions relative to 1990 by 2030. *Portugal* established objectives for sectors not covered by EU ETS, including a GHG emission reduction goal for agriculture of 11% compared to 2005 levels by 2030.

Other Member States, while not having explicit sectoral emission targets for agriculture, will need the sector to contribute to National Effort Sharing decision targets. In *Finland* the government set a 29% GHG emissions reduction target from 2019 to 2035. This includes agriculture's GHG emissions in the effort sharing sector and GHG emissions related to agricultural land use in the LULUCF sector. The main instrument for GHG emission reductions will be the national CAP strategy plan measures over the 2023-2027 financing period.

France's Agriculture Ministry presented an action plan in 2021 to fulfil the 2020 French Low Carbon Strategy, which has targeted an 18% reduction by 2030 in agricultural emissions, compared to a 2015 baseline. This plan includes six sets of actions: (1) accelerating the use of improved agricultural practices that mitigate GHG emissions; (2) developing the carbon sequestration potential of soils and forest biomass; (3) sustaining demand and consumption of low impact food products; (4) fostering climate change adaptation in agriculture and forest supply chains; (5) teaching and innovating via R&D on alternative production methods; and (6) guaranteeing a high level of environmental responsibility (starting at the Ministry). The *Netherlands*' new coalition government agreed to allocate an amount of EUR 25 billion (USD 29.4 billion) cumulative until 2035 for a transition fund to tackle environment and climate challenges in agriculture and nature.

The EC made proposals on 15 December 2021 for Sustainable Carbon Cycles to remove, recycle and sustainably store carbon (EC, 2021[21]). Regarding agriculture, the EC set out three sets of action to support carbon farming: (1) promoting carbon farming practices under the CAP and other EU programmes, such as LIFE and Horizon Europe's "Soil Deal for Europe" research mission; (2) standardising the monitoring, reporting and verification methodologies for carbon farming, to allow development of voluntary carbon markets; and (3) providing improved knowledge, data-management and tailored advisory services to land managers.

Estonia started to develop a methodology for audits of its farms in 2021 to measure carbon footprints and their key products, and to recommend improvements. *France* launched the Carbon Diagnostic Coupon (*Bon Diagnostic Carbone*), with a budget of EUR 10 million (USD 11.76 million), to be allocated to recently settled farmers (five years or less). Applicants can get a 90% price reduction on a diagnostic that measures their GHG emissions and their potential to store carbon, and the development of an action plan and accompanying support to reduce GHG and increase carbon sequestration with the methods of the Low-Carbon Certification (*Label Bas Carbone*).

Domestic policy developments in 2021-22

Overall spending

The EU budget for agriculture and rural development in 2021 was EUR 55.71 billion (USD 65.5 Billion),[21] a small increase of EUR 0.31 billion compared to 2020. Total expenditure under Pillar 1, was EUR 40.4 billion (USD 47.5 billion) (76.8%), with EUR 15.3 billion (USD 18 billion) (23.2%) allocated under Pillar 2.

Markets and sector support

On 23 March 2021, the European Commission presented an **Action Plan for the development of organic production** (EC, 2021[22]). Its overall aim is to boost the production and consumption of organic products, to reach 25% of agricultural land under organic farming by 2030, as well as to increase organic aquaculture

significantly. Structured around three axes - boosting consumption, increasing production, and further improving the sustainability of the sector - 23 actions are put forward to ensure a balanced growth of the sector. A number of Member States also announced initiatives or supports for their domestic organic sectors. *Denmark* has allocated DKK 3.6 billion (EUR 484 million, USD 569 million) to organic farming area support, to help achieve its ambition of doubling the organic farming area by 2030. A strategy will also be developed with the aim of achieving a two-fold increase of the domestic organic consumption and exports. *Poland* drafted "A Framework Action Plan for Organic Food and Farming for 2021–2027".

There has been follow-up in Member States to the Directive on trading practices in the agricultural and food supply chain adopted by the European Parliament and the Council on 17 April 2019. The Directive aims at protecting farmers, farmers organisations and other weaker suppliers of agricultural and food products against stronger buyers. Certain Member States introduced or strengthened legislation related to enhancing the transparency and information across different actors in the food supply chain, often transposing the directive into national law. *Spain* passed the new **Food Chain Law** 16/2021 **to improve the bargaining position of farmers in the food chain**, enhancing the transparency and information across the different actors in the chain. *Poland* adopted the new Act on the Prevention of the Unfair Use of a Contractual Advantage in the Trade in Agricultural and Food Products. In October, *France* adopted the EGAlim 2 law to support farm income. In December, *Austria* published the Law on the improvement of local supply and conditions of competition. *Italy* approved the Legislative Decree no. 198/2021, on unfair commercial practices in business-to-business relations in the agricultural and food supply chain.

On 15 December 2021, the European Commission allocated EUR 185.9 million (USD 218 million) to its 2022 Work Programme to fund **promotion activities for EU agri-food products** at home and abroad. The programme focuses on campaigns that are in line with the ambitions of the European Green Deal, supporting objectives from the Farm to Fork strategy, Europe's beating cancer plan, the EU organic action plan and the Communication on the European citizens' initiative "End the cage age". Campaigns will also highlight the high safety standards of EU agri-food products, as well as the diverse and traditional range of products supported by EU quality schemes. A number of quality promotion initiatives were launched in Member States as well.

Agri-environment and sustainability

In addition to the EU specific policy initiatives on climate change mitigation, covered in a previous section, the European Union and its Member States had a number of agri-environment and sustainability policy initiatives in 2021, some of which also included climate change objectives.

The "**European Green Deal**" (EGD), proposed by the European Commission on 11 December 2019 (EC, 2019[15]), aims to "boost the efficient use of resources by moving to a clean, circular EU economy and stop climate change, revert biodiversity loss and cut pollution, through a just and inclusive transition". Key actions in 2021 relating to the roll-out of the EGD included:

- On 17 November 2021, the European Commission adopted new proposals for curbing EU-driven deforestation; facilitating intra-EU waste shipments to promote circular economy and tackle the export of illegal waste and waste challenges to third countries and; developing a new Soil strategy, to have all European soils restored, resilient, and adequately protected by 2050 (EC, 2021[23]).On 4 December 2021, the European Commission issued policy guidance for a fair transition towards climate neutrality (EC, 2021[20]), to complement the package on delivering the Green Deal presented in July.
- On 7 December 2021, the European Commission published a staff working document on the **information policy on the CAP**, which indicated the potential for further complementarity between CAP information measures and those of the European Green Deal (EC, 2021[24]).

In addition to an increased focus on climate action within the European Union and its Member States, a number of other agri-environment and sustainability policy developments were initiated or launched in 2021. On 7 July 2021, The **EU Code of Conduct on Responsible Food Business and Marketing Practices**, which is one of the first deliverables of the Farm to Fork Strategy and an integral part of its action plan, was launched (EC, 2021[25]). It sets out the actions that the actors 'between the farm and the fork', such as food processors, food service operators and retailers, can voluntarily commit to undertake to tangibly improve and communicate their sustainability performance.

In November 2021, the **EU soil strategy for 2030** was launched (EC, 2021[26]), which sets out a framework and concrete measures to protect and restore soils, and ensure that they are used sustainably. It sets a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030. It also announces a new Soil Health Law by 2023 to ensure a level playing field and a high level of environmental and health protection. A number of Member States also announced initiatives on soil conservation and protection. There is a new Bund-Länder Agreement in *Germany* on climate protection "moorland soil protection" ("Moorbodenschutz"). Financial incentives are envisaged for the rewetting of peat soils on a considerable scale. The programme also includes measures for reducing the use of peat in growing media, with the goal being to largely eliminate the use of peat in horticulture within this decade. *Austria* agreed the implementation pact "Soil Strategy for Austria - Strategy for the Reduction of Further Land Consumption and Soil Sealing" by 2030. *Denmark* stated the ambition of restoring and rewetting 100 000 hectares of carbon rich peat soils by 2030 with the purpose of reducing both GHG and nitrogen emissions from agricultural soils and forests in Denmark. To help achieve this ambition, DKK 4.4 billion (EUR 592 million, USD 696 million) allocated to restore natural hydrology on 50 500 hectares of agricultural land and extensive management of 38 000 hectares, including previous political agreements. *Ireland* announced EUR 2.7 million (USD 3.17 million) in funding will be provided for the expansion of the National Agricultural Soil Carbon Observatory (NASCO). Data collected by the Observatory will underpin the development of a **carbon farming** model that aims to reward actions that remove carbon and store it in soils.

In 2021, a number of Member States had policy initiatives related to reducing deforestation in agricultural supply chains. *Austria* has developed a **protein strategy** to reduce the dependence on imports and to expand domestic soy production, with the goal of halving soy imports by 2030. In *France,* significant support has been provided in 2021 for increased domestic vegetal protein production as part of the French recovery plan. This includes support for purchasing agro-equipment to produce vegetal proteins, a new fund of EUR 20 million (USD 23.5 million) that offers support for oilseeds that produce proteins (*oléaprotéagineux,* such as rapeseed) and sowing of forage legumes. In addition, support was provided for the development of vegetal protein supply chains: EUR 50 million (USD 58.8 million) has been allocated to projects supporting the functioning and development of supply chains. *Denmark* also launched a joint Action plan against global Deforestation, with the objective that Danish agricultural production should not lead to unintended deforestation or the loss of biodiversity beyond Danish borders. The government aims to ensure that all imported soy and palm oil is verified and documented as deforestation free by 2025. The *Netherlands* launched its National Protein Strategy in December 2020, which aims to increase the level of self-sufficiency of new and existing vegetable proteins over the next five to ten years in a sustainable way. The government also intends to invest in research into new protein-rich sources for both humans and animals, and stimulate the extraction of proteins from residual flows, which is consistent with its **circular agriculture**[22] vision.

Biodiversity was also an important sustainability theme in 2021. Key actions in 2021, within the **Biodiversity action plan**, included: on 16 July 2021, the European Commission proposed a new strategy to protect and restore EU forests (EC, 2021[27]), and on 25 November 2021, the European Commission announced more than EUR 290 million (USD 341 million) in EU funding for nature, environment and climate action projects (EC, 2021[28]) under the LIFE programme. The new LIFE projects are targeted towards helping Europe become a climate-neutral continent by 2050 and putting Europe's biodiversity on a path to recovery by 2030. In 2021, *Portugal* resumed subsidies for the sustainable management of

agricultural habitats located in ecologically protected regions. This covered more than 1 250 farmers for an amount of EUR 5.6 million (USD 6.58 million).

Estonia included the **circular bioeconomy** as a horizontal priority in its new sectoral Agriculture and Fisheries strategy 2030. EUR 23.8 million (USD 28 million) of the Recovery and Resilience facility funding will be used for bioeconomy and bioeconomy related Research development and Innovation (RDI) capacity. *Lithuania* provided EUR 15 million (USD 17.64 million) investment support for biogas production from agriculture residues in 2021.

In October 2021, the European Commission published a roadmap[23] outlining its intention to propose EU-level targets for food waste reduction as part of the revision of the EU Waste Framework Directive. This initiative is part of the Farm to Fork Strategy, which aims to make the EU food supply chain more sustainable. In addition, in March 2021, the Commission extended the mandate of the EU Platform on **Food Losses and Food Waste**, which serves to guide work at the EU level and has inspired further action on the ground in the Member States.[24] In May 2021, *Denmark* initiated the development of an internationally recognised, auditable (ISO) standard for measuring "food loss" and "food waste" (ISO/TC 34/SC 20). Collection of uniform data is important to identify target areas and to follow the progress towards achieving the SDG 12.3. The Danish Government has also initiated "The Food Waste Hunters 2.0" where food businesses are offered professional assistance to reduce food waste at retail and wholesale. In 2021, in *Spain* the "More food, less waste" strategy has been particularly active following the publication of the report on food waste in the food chain in 2020. The government has launched a public consultation based on the future Food Waste Law and a new media campaign on "No food is thrown away here". In *Estonia,* the national food waste and prevention programme in 2021 had a primary focus on food safety, with date marking and raising the awareness of food business operators. In *Poland*, the project "The development of a system for monitoring wasted food and limiting food waste – PROM" was completed in November 2021. On the basis of the results of the project, the National Support Centre for Agriculture (KOWR) prepared the document "The strategy for rationalising losses and limiting food waste". This strategy is the first attempt in Poland to apply a comprehensive approach to preventing losses and limiting food waste at the national level. It sets out, among others, recommendations and proposals for specific actions by all the actors in the food chain.

Animal health and welfare

Some Member States introduced new regulations or provided support for improved animal health and welfare in 2021. *France* and *Germany*, building on initiatives in 2020, announced the banning of slaughtering young male chicks and restrictions on the castration of male pigs. In addition, *Germany* has also changed its animal welfare provision regarding the domestic transport duration of live animals for slaughter to a maximum of four and a half hours in case the temperature exceeds 30 degrees Celsius. This provision came into effect on 1 January 2022. Germany also has started a new initiative in early 2022, to develop a mandatory labelling system for food of animal origin which provides information on different forms of animal husbandry.[25]

The *Czech Republic* expanded subsidy programmes aimed at improving living conditions in animal husbandry. The *Austrian* Pact for Animal Welfare is intended to create incentives for farmers to increase investments in animal welfare. The pact contains 6 priorities: support for investment in animal-friendly husbandry systems (EUR 120 million, USD 141 million per year); support for ongoing efforts to improve animal welfare (e.g. pasture management); reduction of calf transports (e.g. development of local marketing strategies); further development of the Common Agricultural Policy towards more animal welfare; establishment of the Austrian Animal Health Service; and implementation of research results in animal husbandry practice.

Animal and plant disease

A number of different animal and plant pests and diseases affected or threatened some Member States in 2021, for which specific policy measures were introduced. The EU pork sector continues to combat **Africa Swine fever** (ASF). Since ASF first entered *Lithuania* in 2014, a total of 13 EU Member States have been affected by the disease. *Romania* reported the highest number of domestic pig outbreaks in 2021 with a total of 1 665 pig herds affected. *Lithuania* and *Hungary* did not detect any ASF outbreaks in domestic pigs in 2021 but continue to report cases in wild boar. The European Union has legislation in place to prevent the spread of ASF within and between Member States through the implementation of control measures on the movement of pigs and pig products and prohibits the movement of wild boar between Member States (European Commission Implementing Decision 2021/605). The prevalence of ASF plays a significant role in the international pig meat trade as many third countries block market access for EU Member States where the disease is present (Niemi, 2020[29]).

The government of *Bulgaria* approved an ASF Action Plan to support backyard farms in addressing ASF and also approved the 2021-23 plan for ASF Surveillance and Eradication. The *Czech Republic* introduced emergency measures and bounties for the catching of 2 500 wild boars in response to the ASF threat. In *Latvia,* a compensation from the national budget of EUR 213 000 (USD 250 000) was paid in 2021 to pig farmers affected by ASF. In *Poland,* an aid support scheme was introduced for pig producers who have been obliged to temporarily cease pig production in relation to an ASF outbreak.

The **Avian influenza** epidemic season, which started in October 2020, continued in 2021. In the second quarter of 2021, the epidemiological situation improved in the majority of the EU Member States (EC, 2022[30]), however, outbreaks in wild birds continued to be confirmed by several Member States during the summer months. The European Union passed a new **Bluetongue disease** regulation applicable from 21 April 2021 (EC, 2021[31]). The new approach moves from a disease listed for immediate eradication, to a disease that may be subject to optional eradication programmes. This disease was responsible for 205 outbreaks in 10 Member States in 2021.

In *France,* the Ministry of Agriculture and Food started a new promotional campaign in 2021, to encourage farmers to reduce the use of **antimicrobials** to only when needed and at the right level (*les antibios, comme il faut, quand il faut*) to limit the risk of antimicrobial resistance.

Livestock genetic resources

In *Bulgaria*, the Ministry of Agriculture continued to increase the budget in support of breeding associations and subsidise the use of high-quality genetics by farmers, with breeding associations receiving EUR 4.2 million (USD 4.94 million) in early 2021.

Pollinators and Apiculture

On 27 May 2021, the European Commission published a report (EC, 2021[32]) on the implementation of the EU Pollinators Initiative, adopted in 2018 to address the decline of wild pollinating insects and, on 28 June 2021, the European Commission welcomed political support by Member States to improve the protection of bees, limiting the maximum permitted level of honeybee colony size reduction at 10% after the use of a plant protection product, through a forthcoming Regulation enabling the implementation of the Bee Guidance Document (EC, 2021[33]). Some Member States also announced policy developments in 2021. *Germany*, through its Action Program for the Protection of Insects aims to improve the conditions for insects. The special framework plan “Insect protection in agricultural areas” was implemented in 2020. In 2021 its budget was expanded from EUR 50 million (USD 58.8 million) per year to EUR 85 million (USD 100 million), complemented by co-financing of the Bundesländer.

In *Austria,* bee health is the focus of the extensive research project “*Zukunft Biene*” (Future Bee), with a total of EUR 2.5 million (USD 2.94 million) invested to date. In *Hungary,* support measures were

announced for beekeepers, increased support through the Hungarian National Apiculture Programme, extension of the 2020 income replacement allowance, increased income tax allowance from 2021 onward. In *Poland,* a new national agriculture de minimus aid measure was introduced in 2021 to provide aid of PLN 35.5 million (EUR 7.79 million, USD 9.15 million) to beekeeping operators.

Digitalisation

On 9 March 2021, the European Commission presented a vision and avenues for Europe's digital transformation by 2030 (EC, 2021[34]). In addition to the focus on skills, digital transformation of businesses and secure and sustainable digital infrastructures, the **Digital Compass** for the EU's digital decade also includes digitalisation of public services. In the agricultural sector, this work is related to a preparatory action for **a Common European Agricultural Data Space,** which was launched on 17 November 2021, under the Digital Europe Programme (DIGITAL). Production data supplemented by publicly held data will present new opportunities for monitoring and optimising the use of natural resources and will contribute to achieving the objectives of the Green Deal and Common Agricultural Policy.

In the agricultural sector, a good example of the digital transformation is the ongoing development of the **Agri-food Data Portal,** which is a data sharing tool for domains such as agri-food markets, CAP indicators, farm economics, geoportals (i.e. geospatial data), EU financing and EU Member State fact sheets (EC, 2022[35]). Further actions, developed in collaboration with Member States, are "**Checks by Monitoring**" applying automated analysis procedures to free Copernicus Sentinel satellite data for the monitoring of agricultural activities and conditions and the "Area Monitoring System" (AMS, not yet in use), which is a new element of the Integrated Administrative Control System in the post-2020 CAP. Two Member States, *Belgium* and the *Czech Republic,* elected to use the CAP check by monitoring option (using sentinel satellites) to reduce the number of physical farm inspections in 2021.

Germany has committed EUR 50 million (USD 58.8 million) to the digitalisation of agriculture trials. In fourteen test sites, located on farm holdings throughout the country, the testing comprises digital applications to protect the environment, improve animal welfare, promote biodiversity and reduce workloads in both crop production and animal husbandry. In addition, starting in 2021, the use of artificial intelligence (AI) in agriculture, food chain, health nutrition and rural areas is supported with EUR 41 million (USD 48.2 million). This activity includes 35 projects of industrial research as well as experimental development. In addition, an agricultural data platform[26] has been published. In *Spain,* the second action plan 2021-23 of the 2019 **strategy for the digitalisation of agro-food, forestry and rural sectors**, has started to apply 21 specific measures with a budget of EUR 64 million (USD 75.3 million). Some of these measures will be framed under the Recovery, Transformation and Resilience Plan (EU Recovery and Resilience Facility RRF). Among these measures, a new credit line aimed at promoting innovative technology digital projects for small and medium enterprises in the agri-food sector and rural areas started in 2021 worth EUR 33 million (USD 38.8 million). In the Framework of the Agro-food Strategic Project for Economic Recovery and Transformation (PERTE), Spain aims to spend over EUR 454 million (USD 534 million) in the digitisation of the agri-food sector.

France launched the French AgriTech platform supporting startups and to support to the development of technological innovation in the sector of AgriTech and FoodTech. EUR 200 million (USD 235 million) will be invested over five years for innovating projects for the Third Agricultural Revolution, food and health. In addition, the fourth plan of investment for the future, has dedicated significant funding to two projects: (1) developing innovative solutions to support competitiveness and resilience of the agriculture and agri-food sector in its agro-ecological transition (EUR 428 million, USD 503 million); and (2) conceive solutions for more sustainable and healthier food (EUR 449.5 million, USD 528.8 million).

Food safety and traceability

On 30 March 2021, the **Transparency Regulation in the Food Chain** came into effect (EC, 2021[36]). The regulation aims to increase trust in science and in EU policy-making by bringing greater transparency of the EU's risk assessment in the food chain; increased independence of scientific studies; strengthened governance of European Food Safety Authority (EFSA) and scientific co-operation; and more comprehensive and effective risk communication. In November 2020, *Germany* implemented the **front-of-pack nutrition label** scheme "Nutri-Score" into German law. Enterprises can now use the logo on a voluntary basis. "Nutri-Score" was developed through extensive consultations with all stakeholders, including the food industry, health and consumer associations. It provides more clarity when making food choices and better guidance for consumers that are able to compare the nutritional value of foods easily and at one glance. The introduction of the "Nutri-Score" label scheme was accompanied by an information campaign to inform and support both consumers and companies. While harmonised European Union rules are being developed, the Nutri-Score has already been adopted on a voluntary basis by several other European countries, including France, Belgium, Spain, Luxembourg, and the Netherlands.

Risk management

On 24 February 2021, the European Commission published an updated EU Strategy on Adaptation to Climate Change (EC, 2021[37]). With this strategy, the Commission wants to foster EU adaptation to climate change throughout all sectors of the economy, including agriculture. This includes finding practical solutions to adapt to droughts, promote "**nature-based solutions"** and increase plant and crop resilience through better use of genetic diversity and non-harmful plant genetic resources for adaptation. The European Commission also has an EU **Climate-Adapt portal,**[27] showing the national adaptation plans of Member States, in which agriculture and land use are featured prominently. In 2021, the risk management policy focus of certain Member States varied between supports to assist producers cope with depressed markets due to the COVID-19 pandemic (see COVID-19 section) or weather related impacts.

In 2021, the *Czech Republic* approved an updated version of its national Strategy for Adaptation to Climate Change and its National Action Plan for Adaptation to Climate Change.

A new national aid scheme was launched in *Poland* to support agricultural producers whose farm holdings suffered losses in 2020. The aid rate was differentiated depending on crops, percentage yield losses per hectare of the crop area and the type of a disaster. The payments in 2021 varied between PLN 500 (EU 110, USD 129) and PLN 1 200 (EU 263, USD 309) per hectare. The aid is reduced by 50% in the case of farmers who have failed to insure at least 50% of the crops affected by losses. *Germany* also provided support for its farmers negatively impacted by climate events. After the devastating floods in 2021, the German Federal Government made available emergency aid that is used for reconstruction in the flooded areas, including agriculture, forestry, viticulture, and aquaculture as well as the reconstruction of rural infrastructure. In 2021, two Bundesländer supported insurance solutions for frost and storm damage for the first time in Germany.

The *Czech Republic* provided *ex post* support for tornado damage to crop, livestock, fruit and vegetable growers, and wine producers in 2021. Compensation was provided for up to 100% of damage caused. The State Agricultural Intervention Fund provided cash advances quickly to applicants affected by tornado damage during the period from 12 July 2021 to 17 August 2021.

France provided ***ex post*** compensation for exceptional spring **frost damage**, to fruit growers and viticulture enterprises. The government responded by compensating farmers and fruit growers, as part of a EUR 1 billion (USD 1.17 billion) broader plan in April 2021. The frost compensation plan included multiple actions, from guaranteed credit to tax credits, funding of losses, emergency fund, and investments in equipment. In November 2021, the government also announced support for producers impacted by floods earlier in the year. In addition, EUR 8.4 million (USD 9.88 million) was provided as tax credits to

producers impacted by droughts during the summer of 2021. Other measures were taken, such as exempting some CAP requirements.

Agricultural insurance schemes and climate adaptation planning were also prominent topics for certain Member States in 2021. *France* initiated a number of agricultural risk management initiatives in 2021. A broad dialogue on agriculture and water towards improved **climate change adaptation** was launched titled "*Varenne agricole de l'eau et de l'adaptation au changement climatique*". The government set up a working group on how to reform instruments to manage climatic risks in agriculture and the French Agriculture Minister has signed an official circular to department prefects to give them more autonomy and responsibility when facing droughts in agriculture. *Portugal* allocated EUR 70 million (USD 82 million) within the programme "Improving the Efficiency of Existing Irrigation", to finance studies and works for irrigation.

The **Agricultural Insurance policy** of *Spain* is financed through state aid (and not the CAP risk management toolkit) and continues to be the main national risk management measure. The system covered in 2021 a total insured capital of EUR 15.6 billion (USD 18.4 billion) with about 309 000 insurance policies. The government budget to support insurance policies reached EUR 254 million (USD 299 million) in 2021. In *Slovenia,* compared to previous years, in 2021 the co-financing of insurance of primary agricultural production increased and standardised. The co-financing rate for all insurance premiums (field crops and permanent crops, animal diseases, etc.) is 55%. In 2019 and 2020, the co-financing rate for field crops and permanent crops was 50% and for animals 30%. In the *Czech Republic*, state aid funded financial support worth CZK 658 million (EUR 25.7 million, USD 30.2 million) was provided in 2021 for agricultural and forestry insurance. The support was provided in the form of compensation of part of insurance premium, within individual support programmes. The amount of support under individual programmes varies between 50% and 62% (for special crops) of the premium paid.

Hungary implemented its new Agricultural Crisis Insurance Scheme in 2021, as a voluntary scheme, with a period of subscription of three years for farmers entering into the system. The scheme offers partial compensation of revenue in case of extreme events affecting crop production. The Insurance Premium Support Scheme (funded under the RDP) budget was increased from HUF 7 billion (EUR 20 million, USD 23 million) in 2020 to HUF 13 billion (EUR 36 million, USD 43 million) in 2021.

Supports to specific groups of farmers

In *Spain,* a new strategy for encouraging young farmers was approved in 2021, and it will be part of the new National Strategic Plan with measures for **young farmers.** A new programme facilitates internships of young future farmers in good practice farms (CULTIVA) as a tool to promote the exchange of knowledge and experience. *Spain* is also incorporating a gender approach into some of the measures in the National Strategic Plan for the new CAP in both Pillar 1 and Pillar 2 of the CAP, where there will be a higher payment rate for female young farmers. In addition, the Ministry has provided a new support measure from 2021 for farms with shared ownership, to give visibility to women that work in the farms of their spouses with a budget of EUR 1 million (USD 1.18 million). In *Hungary,* a law facilitating farm transfer to the younger generation was adopted by the Hungarian Parliament at the end of 2021.

Taxation

In *Austria,* the "eco-social tax reform" is supporting investments with ecological components: a total of EUR 500 million (USD 588 million) has been earmarked for various measures to switch to renewable energy for heating (biomass, pellets, etc.), which applies to overall economy. Another goal is to establish as many energy self-sufficient farms as possible, which generate electricity for their own needs from building- and farm-integrated photovoltaic systems including storage facilities. A special investment programme for agriculture with a volume of EUR 25 million (USD 29.4 million) per year will be available for this purpose. Other measures relevant to agriculture include the reduction of health insurance contributions

by 1.7%, especially for small incomes, including compensation for the loss of revenue for health insurance as of 1 July 2022, exemption from the own electricity levy for renewable energy and an investment allowance including a greening component (based on the investment premium).

Investment

Food and agriculture were supported through more targeted subsidies in some Member States in 2021. *Ireland* introduced a new EUR 70 million (USD 82.4 million) Capital Investment Scheme for the Processing and Marketing of Agricultural Products, to help farmers and those working in food production to develop and diversify, following the United Kingdom's exit from the European Union. This investment is part of the EUR 100 million (USD 117.6 million) Scheme first announced on 28 December 2020. In *France*, a new plan was launched in July 2021 to modernise and secure French slaughterhouses. It included three components: (1) Investment: financed through the recovery plan fund (EUR 115 million, USD 135 million); (2) Control: new controls to ensure compliance with regulations, with a new inspection agency created, that will help local authorities in specific cases; and (3) Sanctions: ensure that prefects impose the right sanctions to non-compliant slaughterhouses.

In *Spain,* agriculture benefited from the **Recovery, Transformation and Resilience Plan** (EU Recovery and Resilience Facility RRF) with investments that prioritise precision agriculture, energy efficiency and circular economy with a budget of EUR 307 million (USD 361 million) for 2021-23. The ministry has had an ongoing role during decades to **invest on improving irrigation** both through its budget and the public agency SEIASA (Sociedad Mercantil Estatal de Infraestructuras Agrarias). In 2021, an investment plan for sustainable irrigation systems was launched, with the support of the EU RRF. Under the Spanish RRP, more than EUR 800 million has been earmarked to cover investments on modernising the irrigation systems covering approximately 100 000 hectares. Spain also spent EUR 6.5 million (USD 7.6 million) in 2021 on its plan to renovate farming machinery (**Plan Renove**), compared to EUR 8 million (USD 9.4 million) in 2020. It allows substituting old equipment by new machines that reduce emissions and are more compatible with environmental sustainability goals.

Germany announced a total budget of EUR 816 million (US 960 million) for the years 2021-24 for the **Investment and Future Programme**. This programme covers investments in agricultural machinery for precision agriculture, storage capacity of farm manure and small-scale facilities (including mobile ones) for manure separation, and planning and advisory services directly related to these investments. In *Italy*, the National Recovery and Resilience Plan (NRRP) was approved in January 2021. The NRRP includes the "Sustainable Agriculture, Green Enterprise and Circular Economy" component. Key objectives of this part are the promotion of environmental sustainability in the agricultural production chain, the support for innovative decarbonisation projects within circular economy processes, as well as the establishment of a national plan for the circular economy. In particular, the sustainable agriculture component accounts for a total budget of EUR 2.5 billion (USD 2.94 billion).

In *Austria,* the credit volume of agricultural investment loans was increased to EUR 180 million in 2021 (USD 212 million). These are loans subsidised with an interest subsidy. The interest subsidy is generally 36%, but 50% for certain subsidy cases and the disadvantaged area. In *Latvia*, two national financial instruments were introduced in the RDP for the transition period - Loans for rural small scale entrepreneurs (EUR 20 million, USD 23.5 million) and Credit guaranties (EUR 10 million, USD 11.76 million) which contributes to three RDP sub-measures - Aid for investment in agricultural holdings, Aid for investment in processing, Aid for investment in the creation and development of non-agricultural activities.

In *Hungary*, a new soft loan scheme (Agricultural Restart Investment Loan Széchenyi) was introduced in 2021, as part of the economic recovery package (Széchenyi Card Programme), offering preferential conditions for loans for agricultural and forestry conducting new investments, including those supported by the Rural Development Programme.

Innovation and knowledge

On 29 April 2021, the European Commission opened a debate on New Genomic Techniques following a study, which shows their potential for sustainable agriculture and the need for new policy (EC, 2021[38]). This study was followed up with a number of communication events, including on 29 November 2021, the European Commission organised a high-level event to help develop a system that enables breeders to bring better varieties to market, improves farmers access to such varieties; and allows coexistence with other forms of agriculture, to deliver a more sustainable and more resilient food system for the European Union (EC, 2021[39]). Gene-edited crops are currently only grown on test fields in the European Union (EC, 2022[40]).

In *Portugal,* the Ministry of Agriculture in October 2021, opened tenders for funding research and development projects, for a total budget of EUR 93 million as part of the Recovery and Resilience Plan. Projects are expected to address reduction of GHG emissions in the agricultural sector and enhance carbon sequestration as well as to promote digital transformation.

Domestic policy responses to the COVID-19 pandemic

The European Union implemented three main types of policies responses in the agricultural sector: CAP flexibilities, exceptional market measures, and direct support to farmers and rural areas. Within this framework, Member States chose which measures to implement, based on their own specific circumstances. Member States also put in place their own regulatory flexibilities, tax concessions and social contribution measures, investment assistance, and allowances to farm households to help farmers and agro-food enterprises cope with the financial impacts of the COVID-19 emergency. Response measures also responded to labour concerns within the sector, ensured minimal interruptions to food supply chains, and helped to ensure that affected consumers had adequate access to food. Finally, some policies were put in place to facilitate longer-term recovery and sector transformation.

Specific actions taken by the European Commission, in the context of the ongoing **COVID-19 pandemic**, are detailed on the European Commission website (EC, 2022[41]). While the emphasis of the actions has shifted to longer-term health policy and financial recovery packages, several have a more direct relation to the agriculture and food sectors.

The European Commission decided to prolong until 31 December 2021, **the State Aid Temporary Framework,** adopted on 19 March 2020 (EC, 2020[42]) to support the economy in the context of the coronavirus outbreak. The European Commission has also decided to expand the scope of the Temporary Framework by increasing the ceilings set out in it and by allowing the conversion of certain repayable instruments into direct grants until the end of next year.

On 6 October 2021, the European Commission adopted exceptional measures to support **the wine, fruit and vegetable sectors** (EC, 2021[43]), including increasing support for risk management tools, such as harvest insurance and mutual funds, and extending the flexibility measures already in place until 15 October 2022.

In addition, on 15 June 2021, the European Commission presented a Communication on the early lessons learnt from the COVID-19 pandemic, in which the importance of the **Green Lanes initiative in maintaining the integrity of supply chains, ensuring supplies of food** and medicines in the Single Market, was emphasised (EC, 2021[44]).

CAP and regulatory flexibilities

On 4 May 2021, the European Commission adopted rules to extend to 2021 flexibilities for carrying out checks required for CAP support. These rules aim at easing the administrative burden of national paying agencies by adapting to current circumstances while still ensuring necessary controls for CAP support.

The rules allow replacing on-farm visits by the use of alternative sources of evidence, including new technologies such as satellite imagery or geo-tagged photos. This measure ensures reliable checks while respecting restriction of movements and minimising physical contacts between farmers and inspectors. Furthermore, rules include flexibility around timing requirements for checks. This allows Member States to postpone checks, notably to a period when movement restrictions are lifted. In addition, rules comprise a reduction of the number of physical on-the-spot checks to be carried out for area and animal-related measures under direct payments and rural development, rural development investments and market measures for the fruit, vegetables, wine, olive oil and apiculture sectors. The rules will apply retroactively to cover controls from the beginning of 2021.

On 4 August 2021, the European Commission adopted a measure allowing farmers to receive **higher advances of common agricultural policy (CAP) payments.** This measure will support and increase the cash flow of farmers affected by the COVID-19 crisis and by the impact of adverse weather conditions across the European Union. The measure will allow Member States to pay income support and certain rural development schemes to farmers with a higher level of advances: up to 70% (from 50%) of direct payments and 85% (from 75%) of rural development payments. The safeguards to protect the EU budget apply, so the payments can be disbursed once controls and checks have been finalised and as from 16 October 2021. This flexibility has been utilised by certain Member States in 2021.

Exceptional market measures

On 28 January 2021, the European Commission adopted the extension of exceptional measures to support the wine sector by one year, making the measures applicable until 15 October 2021 and retroactive from 16 October 2020. Hard hit by the consequences of the COVID-19 crisis, the wine sector suffered from the closure of restaurants and bars across the European Union, the restrictions and cancellations of celebrations as well as rapid changes in demand.

In *Slovenia*, to deal with a market disturbance in the wine sector caused by the second wave of COVID-19, three measures were implemented and co-financed by the European Agricultural Guarantee Fund (EAGF). These measures were: crisis distillation (EUR 4.36 million, USD 5.1 million was paid out), storage of wine (EUR 50 000, USD 58 000 was paid out), and green-harvesting (EUR 0.12 million, USD 0.14 million was paid out), which together amounted to about EUR 4.53 million (USD 5.33 million) (European Agricultural Guarantee Fund - EAGF and national funds). All other measures related to the COVID-19 pandemic and other exceptional aids to different sectors were funded only by national funds and described below.

In *Hungary,* the wine and grape sectors continue to be supported through the 2019-2023 Hungary's National Support Programme, relying on EU level sectoral aid financed through the European Agriculture Guarantee Fund (total aid EUR 145.5 million, USD 171 million).

The *Czech Republic* introduced a new license for the denaturation of alcohol for the disinfection production that came into force on 1 July 2021.

In *Romania,* in May 2021, the government established the legal framework for three temporary measures supporting the wine sector in 2021, namely distillation of wine, crisis storage aid and pre-ripening harvesting, in order to cushion the shock stemming from the COVID-19 pandemic.

In *France (outside of recovery plan)*, the prime minister announced an exceptional support of up to EUR 60 million (USD 70.6 million) to the livestock farmers which faced significant difficulties due to the COVID-19 crisis. This aid was targeted towards farmers with revenues under EUR 11 000 in 2020 and showed significant losses. In April 2021, the government also announced a continuation of the allocation of replacement labour for eligible farmers and parents of young children, that have to stay home due to COVID-19 and associated isolation requirements.

Direct support instruments

Hungary continued to operate **de minimis aid** authorised under the **EU Temporary Framework** defined by the European Commission (2020/C 91 I/01 and its amendments) until 30 June 2022. A new **soft loan scheme** (Agricultural Restart Investment Loan Széchenyi), introduced in 2021 as part of the economic recovery package (Széchenyi Card Programme), offered preferential conditions for loans for agricultural and forestry conducting new investments, including those supported by the Rural Development Programme.

In *Latvia,* state aid was provided to farmers and producers in certain affected sectors to mitigate the negative effects of COVID-19. The aid budget was as follows: the pig sector for the period from November 2020 to October 2021 (EUR 12.7 million, USD 14.9 million), the cattle sector for the period from October 2020 to March 2021 (EUR 1.71 million, USD 2 million) and the poultry sector for the period March 2020 to May 2021.

In *Romania*, an Emergency Ordinance in June 2021, established a temporary state aid scheme to support the activity of cattle farmers in the context of the economic crisis caused by the COVID-19 pandemic. The ceiling for the subsidy that can be granted per farm is EUR 0.225 million (USD 0.265 million). In June 2021, the government approved the programme to support the production of vegetables in protected areas. This established a *de minimis* aid scheme to support the production of vegetables in protected areas in 2021. The crops which can be covered by the scheme are peppers, cucumbers, tomatoes, aubergines. The ceiling allocated to the support scheme is EUR 30 785 (USD 36 194) per farm. In *Slovenia*, state aid was provided to farmers in some affected sectors to mitigate the negative effects of COVID-19 (viticulture and wine production, apple production, potato production, beef production, pig production, sheep and goats breeding and other gainful activities on the farm). This support was provided on the basis of a 30% drop in income compared to the average for the previous three years. In addition to COVID-19 measures, due to the frost and other unfavourable weather conditions and other economic instability, exceptional state aid was provided to fruit and wine growers, beekeepers, and pig farmers. *Estonia* utilised the EU **Temporary State Aid framework** to support to support its agricultural sector during the COVID-19 pandemic. Direct payments of EUR 5.5 million (USD 6.5 million) were paid to assist the pig and dairy sector with the poor market situation. In total, EUR 15.8 million (USD 18.6 million) was paid out for a wide range of agricultural sectors in June 2021. *Austria* also had loss compensation for the pig, wine, potatoes and laying hens sectors (in addition to support to non-agricultural on-farm activities).

In *Greece*, several decisions were taken in 2021 to support specific sectors in the context of the EU temporary framework on state aid measures: production of outdoor watermelon, summer and autumn potatoes, greenhouse crops of tomatoes & cucumbers and buffalo farming. The total support credit amounted to EUR 24.3 million (USD 28.6 million). Pig breeding, breeding of indigenous Greek Black Pigs and apiculture (total support credit: EUR 19.9 million, USD 23.4 million).

The *Czech Republic*, foodstuffs from the school's Fruit and Vegetables for Schools and School Milk programmes were distributed through food banks in the 2020/2021 school year, given the fact that schools were closed for some time of the school year.

Certain Member States also used taxation measures to support their agricultural sectors in 2021. Several countries applied excise reduction or tax rebates for agricultural diesel, to assist with the COVID-19 pandemic and or to help compensate for higher fuel prices in 2021 (see below):

- *Estonia:* 25% excise reduction on diesel used on farms.
- *Greece*: reinstatement of tax rebate on agricultural motor oil for 2022.
- *The Czech Republic*: refund of excise rate of agricultural diesel, subject to certain conditions in 2021.
- *Lithuania*: reduced excise duty for agriculture activities by 5.7% since 1 July 2021.

Agricultural labour

Although the COVID-19 pandemic impact on the international movement of agriculture labour was considerably less than in 2020, a number of policies were initiated by Member States to facilitate in particular seasonal workers in 2021. In *Austria,* with the new Rural Employment Act as of 1 July 2021, clear regulations and accelerated legislative procedures have been implemented for agriculture and forestry in Austria for the first time. Not only the 30 000 employees in agriculture and forestry will benefit, but also the approximately 162 000 farms.

The *Czech Republic* during 2021 issued updated communications with rules for the entry and return of foreign workers, including workers in agriculture and in food industry. During the ongoing pandemic, foreign workers from third countries were allowed to enter the Czech Republic under defined conditions. The Qualified Employee Programme provides support to direct employers who need to bring qualified foreign workers to the Czech Republic.

In *France*, two campaigns were launched in July and August 2021, to help hire people in agriculture and the agro-food sector. The communication campaigns, focused on the attractiveness of these professions, were widely broadcast on various channels: TV, national daily press and regional daily press.

Food supply chains

Following the announcement in the **Farm to Fork Strategy** "to develop a contingency plan for ensuring food supply and food security" in the last quarter of 2021, in its Communication of 12 November 2021, the European Commission acknowledged the overall resilience of the EU food supply chain, identified existing shortcomings, and put forward actions to improve preparedness at the EU level (EC, 2021[45]). To do this, the European Commission will establish a **European Food Security Crisis preparedness and response Mechanism (EFSCM)**, which comprise a group of food supply chain experts co-ordinated by the European Commission to exchange data, practices and strengthen co-ordination. Foresight, risk assessment and vulnerability analysis actions within the EFSCM will improve preparedness, prepare for what the future might bring and help to understand uncertainties and potential bottlenecks. Sharing information and best practice on national and European initiatives will take place through digital platforms. Member States will also be encouraged to continue to have or develop their own contingency plans at national level and share them. Co-ordination and co-operation with the international community will be ensured through supporting and participating in relevant global and regional initiatives, in particular AMIS.

Domestic consumer policies

In *France,* new measures aimed at favouring local procurement of meat and improve food quality in school meals,[28] with three action levers: (1) Information: announcing a mandatory labelling in collective food services by end 2021; (2) Set the example: 100% high quality meat and fish (organic, quality labels etc.) in the state's own food services; and (3) Investment: via the recovery plan. Small municipalities and territorial food projects will be able to access EUR 50 million (USD 58.8 million) from the France Relance plan to support these initiatives.

Long term recovery and transformation

NextGenerationEU is an initiative designed to boost the recovery and is the largest stimulus package ever financed through the EU budget. On 10 February 2021, the European Commission welcomed the European Parliament's approval of Recovery and Resilience Facility (EC, 2021[46]), which is the key instrument at the heart of NextGenerationEU. Plans were submitted by Member States throughout 2021, and those endorsed by the European Commission (EC, 2021[47]) and which contain explicit rural or agricultural actions were: *Austria*: deployment of Gigabit connectivity in rural regions. *Croatia:* investment in digital infrastructure in remote rural areas. *Denmark:* extending rural broadband coverage. *Estonia*:

deployment of high capacity networks in rural areas, and *Spain*: green and digital transformation of the agri-food system.

Trade policy developments in 2021-22

The European Union's simple average **MFN applied tariff** rate for agricultural products was 11.2% in 2020, down from 11.4% in 2019 (WTO, 2022[48]). This applied tariff rate for agricultural products remains nearly three times the average applied tariff rate for non-agricultural products, calculated at 4.1%.

The price-based **special safeguard system** was operationalised in marketing year 2020/21 for certain frozen chicken carcasses, boneless frozen turkey cuts, and some preparations of poultry meat. During the same period, the volume-based special safeguard action was not invoked. However, the system was made operational at the level of calculation of figures for the trigger volumes for some fruit and vegetable products, including tomatoes, cucumbers, artichokes, courgettes, oranges, clementines, mandarins, lemons, table grapes, apples, pears, apricots, cherries, peaches and plums (WTO, 2021[49]).

EU duties on imports of certain husked rice were adjusted twice in 2021,[29] dropping to EUR 30 (USD 35.3) per tonne on 6 March 2021 and then increasing slightly to EUR 42.5 (USD 50) per tonne from 8 September 2021. Prior to the fluctuations in 2021, duties on this product had been set at EUR 65 (USD 76.5) per tonne since 8 September 2020.

Trade agreements

On 24 December 2020, the European Union and the United Kingdom reached an agreement on their future relationship and formally signed the **EU-UK Trade and Cooperation Agreement** on 30 December 2020 (EC, 2021[50]). The agreement entered into force on 1 May 2021 after approval of the European Parliament and adoption by the Council. On 8 March 2021, the European Union and the United States successfully concluded negotiations to adjust the European Union's World Trade Organization (WTO) agricultural quotas. This is the culmination of two years of negotiations in the WTO framework to divide these EU quotas, with part of the volume remaining with the EU 27, and part going to the United Kingdom, based on recent trade flows. The agreement covers dozens of quotas and billions of euros of trade including for beef, poultry, rice, dairy products, fruits and vegetables and wines.

Agreements are still under negotiation with Australia, China, Indonesia, New Zealand and the Philippines (EC, 2022[51]). On 18 February 2021, the European Commission sets course for an open, sustainable and assertive EU trade policy, reflecting the concept of open strategic autonomy, in its "**Trade Policy Review**" Communication (EC, 2021[52]). In the agricultural sector, emphasis was given to the importance of transparency and the role of the Agriculture Market Information System (AMIS),[30] crisis preparedness; support for agri-food Small and Medium-sized Enterprises (SMEs); the need to promote sustainable investment in agriculture in Africa; and the need to mainstream environmental sustainability aspects in the agricultural negotiations, in line with the necessity of the green transition of economies.

On 22 September 2021, the European Commission announced its plans for **a new EU Generalised Scheme of Preferences** (EC, 2021[53])**,** keeping the current structure with its three market access arrangements for low and lower-middle income countries (standard GSP); GSP+ for vulnerable countries, based on sustainable development and good governance commitments; and Everything But Arms for least developed countries. The aim of the proposal is to reinforce the scheme's social, environmental and climate aspects, reduce poverty and increase export opportunities for developing countries. The European Commission's proposal is based on an impact assessment (EC, 2021[54]), published on 22 September 2021.

On the second anniversary of the **EU-Japan Economic Partnership Agreement, in February 2022,** the list of protected Geographical Indications (GIs) was extended by 28 GIs each from EU countries and from Japan (EC, 2022[55]).

Disputes

On 19 January 2021, Malaysia requested WTO dispute consultations with the European Union regarding measures adopted by the European Union and its Member States affecting palm oil and palm crop-based biofuels (WTO, 2021[56]). Malaysia claims that the challenged measures of the European Union and EU Member States, France and Lithuania, are inconsistent with the WTO's Agreement on Technical Barriers to Trade, the General Agreement on Tariffs and Trade 1994, and the Agreement on Subsidies and Countervailing Measures. On 11 November 2021, Brazil also requested WTO dispute consultations with the European Union regarding EU measures impacting the importation of certain poultry meat preparations from Brazil (WTO, 2021[57]). Brazil claims the application by the European Union of Salmonella food safety criteria on fresh poultry meat and certain poultry meat preparations are inconsistent with provisions under the WTO's Agreement on Sanitary and Phytosanitary Measures and the General Agreement on Tariffs and Trade (GATT) 1994.

Initiatives on reducing deforestation

The European Commission on 17 November 2021, proposed **a new Regulation to curb EU-driven deforestation and forest degradation**. The proposed new rules would guarantee the products that EU citizens buy, use and consume on the EU market do not contribute to global deforestation and forest degradation. The Regulation sets mandatory due diligence rules for companies that want to place these commodities on the EU market with the aim to ensure that only deforestation-free and legal products are allowed on the EU market. The European Commission will use a benchmarking system to assess countries and their level of risk of deforestation and forest degradation driven by the commodities in the scope of the regulation.

Contextual information

The European Union is the largest economic region covered in this report, accounting for 17% of the economic activity of all countries covered herein. Although the contribution of agriculture to both GDP and employment has been relatively stable since 2000, the share of agriculture in the region's exports has increased by approximately 50% during this period (Table 12.5). More than 40% of the region's landmass is dedicated to agriculture, of which nearly 60% is dedicated to arable land use. Crops (including cereals, oilseeds, fresh fruit and vegetables, and plants and flowers) predominate in agricultural output, accounting for 57% of total production, although large differences exist across Member States. Livestock products – including dairy, beef and veal, pig meat, sheep meat, poultry and eggs – account for the remainder.

Table 12.5. European Union: Contextual indicators

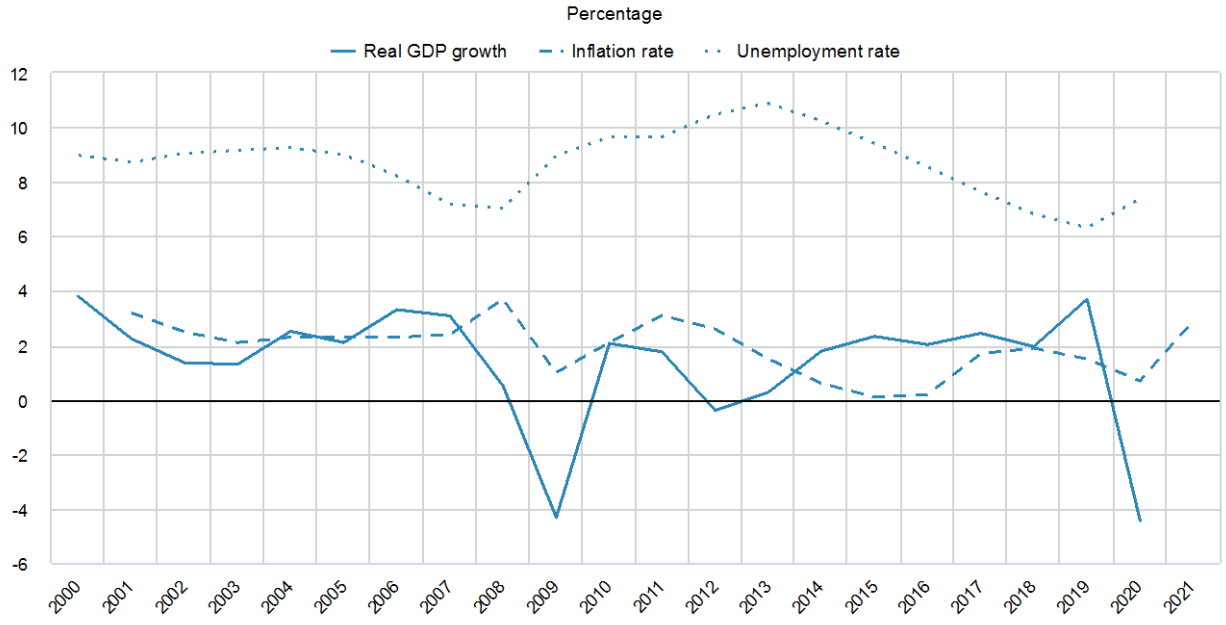
	European Union		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	9 932	18 631	24.9%	17.0%
Population (million)	378	447	8.8%	8.6%
Land area (thousand km²)	*3 124*	*4 183*	*3.8%*	*5.1%*
Agricultural area (AA) (thousand ha)	*140 393*	*182 446*	*4.7%*	*6.2%*
			All countries[1]	
Population density (inhabitants/km²)	114	107	53	63
GDP per capita (USD in PPPs)	26 300	41 584	9 281	20 929
Trade as % of GDP	11	12	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	1.8	2.2	2.9	4.9
Agriculture share in employment (%)	4.3	4.3	-	-
Agro-food exports (% of total exports)	6.0	9.3	6.2	8.5
Agro-food imports (% of total imports)	5.8	6.8	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	54	*57*	-	-
Livestock in total agricultural production (%)	46	*43*	-	-
Share of arable land in AA (%)	*53*	*58*	*32*	*34*

Notes: *or closest available year. Data in italics refer to EU28. EU15 for 2000 and EU27 for the most recent year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

GDP in the region fell 4.4% in 2020, due to the fallout of the COVID-19 emergency. Prior to 2020, GDP growth had been positive since 2013 (Figure 12.5). Despite the economic contraction, the unemployment rate increased only modestly to 7.4% in 2020 – likely due to government rescue packages intended to blunt the economic impact of the crisis. In fact, in spite of the crisis, the unemployment rate in 2020 was reported as more than three points lower than the 10.9% reported in 2013. Inflation declined in 2020 to 0.7% but rose to 2.9% in 2021, the highest level in a decade. While these indicators reflect the EU aggregate, economic conditions vary considerably among the different Member States.

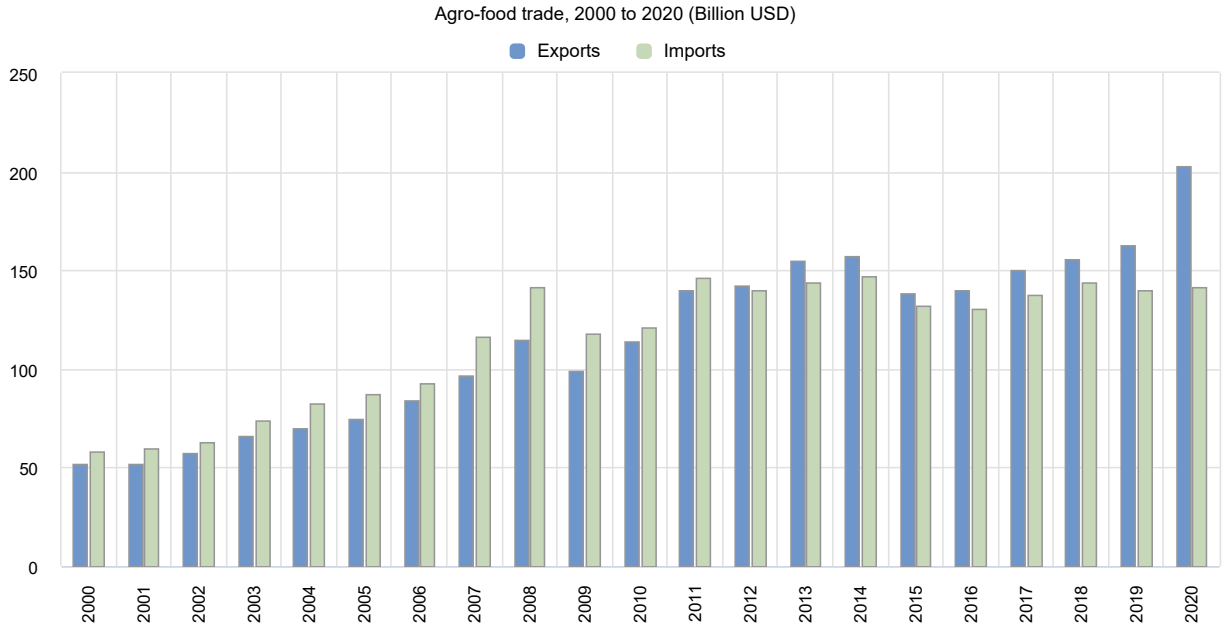
The European Union has been the world's largest agro-food exporter since 2013, and remains one of the largest importers as well (Figure 12.6). The region is a net food exporter, with agro-food products accounting for 9.3% of all EU exports and 6.8% of all EU imports. The region's agro-food exports are overwhelmingly composed of processed goods for final consumption (62%), while imports are more evenly distributed among the four categories shown in Figure 12.6, with processed goods for final consumption accounting for the largest share of imports (27%).

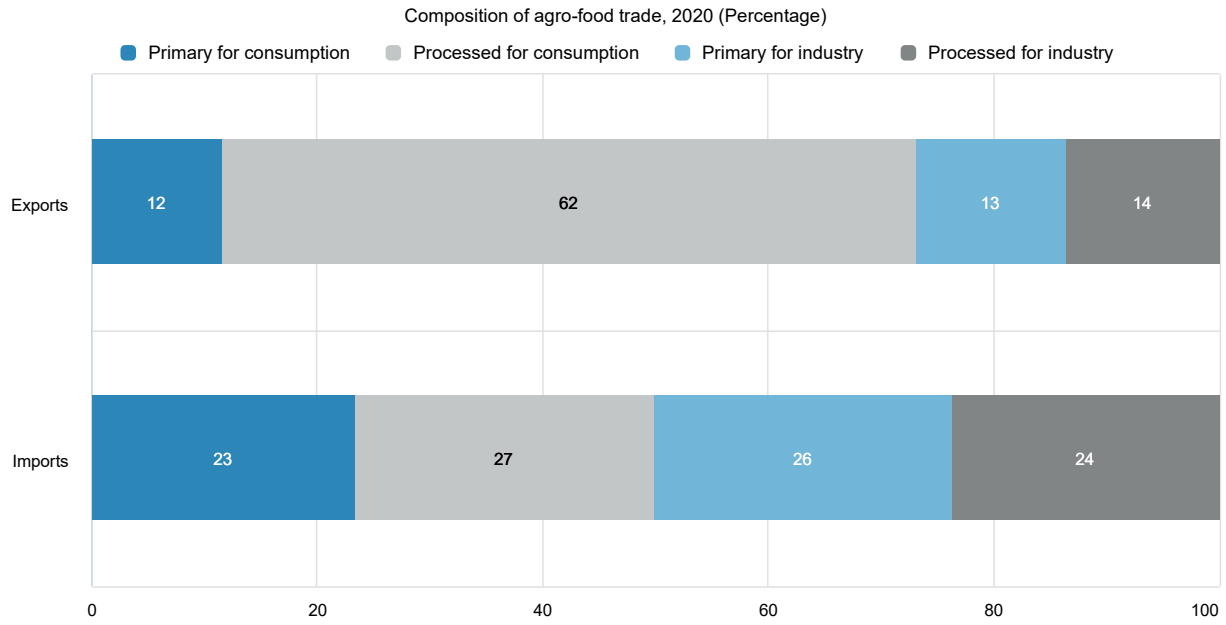
Figure 12.5. European Union: Main economic indicators, 2000 to 2021



Note: EU28 for 2000-19 and EU27 (excluding the United Kingdom) from 2020.
Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 12.6. European Union: Agro-food trade



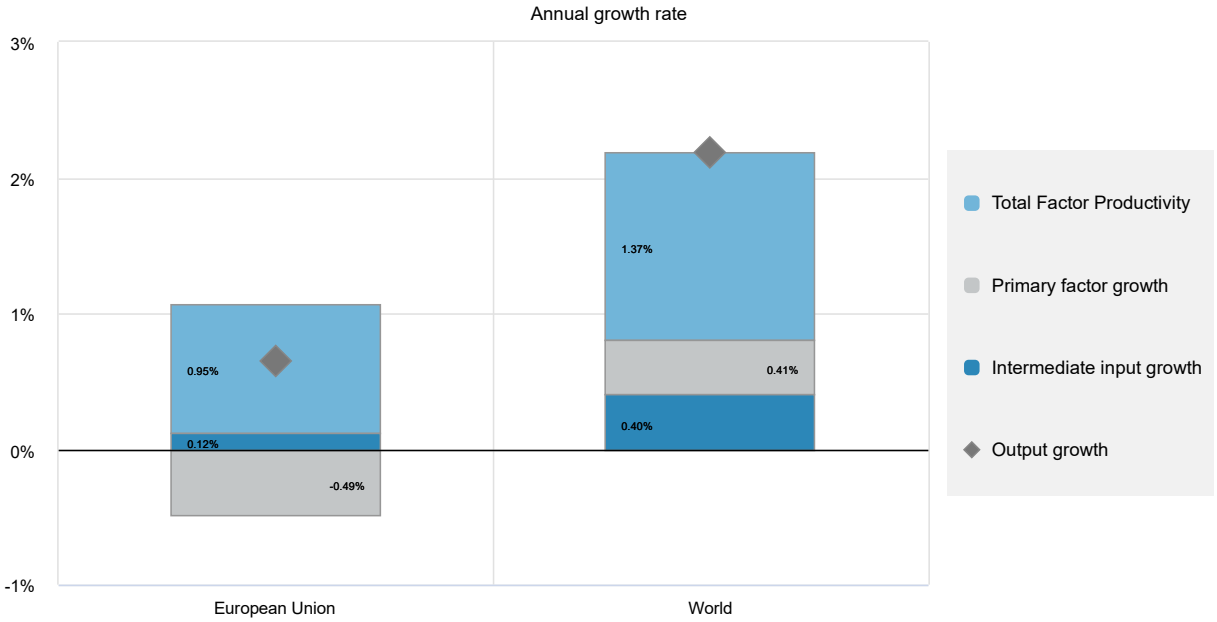


Notes: Numbers may not add up to 100 due to rounding. Extra-EU trade: EU15 for 2000-2003; EU25 for 2004-06; EU27 for 2007-13, EU28 for 2014-19 and EU27 (excluding the United Kingdom) from 2020.
Source: UN Comtrade Database.

At 0.65%, agricultural output growth in the European Union over the period 2010-19 was significantly below the world average of 2.2% (Figure 12.7). Total Factor Productivity (TFP) growth was also below the world average over the period at 0.95% on average, but it was still sufficient to more than offset the impact of reduced primary factor input use, including labour, land, livestock and machinery, on agricultural output.

Rising TFP has been achieved in the sector along with a reduction of certain environmental pressures, as illustrated through various environmental indicators (Table 12.6). From 2000 to 2020, the region's nitrogen balance fell by almost 30%, the phosphorous balance declined by 75%, and the share of agriculture in water abstractions fell by 35%. At the same time, although the European Union has achieved reductions in these indicators, some still remain high by comparison. For example, the region's nitrogen balance is over 60% higher than the OECD average, with some Member States with nitrogen surpluses in excess of twice the EU average. While the region achieved improvements in most environmental indicators, agriculture's GHG emissions as a proportion of total European Union GHG emissions increased over the period, from 8.9% in 2000 to 10.5% in 2020.

Figure 12.7. European Union: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser). EU28.
Source: USDA Economic Research Service Agricultural Productivity database.

Table 12.6. European Union: Productivity and environmental indicators

	European Union		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	*1.0%*	*1.0%*	*1.7%*	*1.4%*
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	*68.4*	*48.9*	*32.1*	*30.0*
Phosphorus balance, kg/ha	*7.3*	*1.8*	*3.4*	*2.9*
Agriculture share of total energy use (%)	*2.0*	*2.5*	*1.7*	*2.0*
Agriculture share of GHG emissions (%)	*8.9*	*10.5*	*8.6*	*9.7*
Share of irrigated land in AA (%)	..	..	-	-
Share of agriculture in water abstractions (%)	*41.3*	*26.8*	*46.3*	*43.7*
Water stress indicator	..	..	9.7	8.6

Notes: * or closest available year. Data in italics refer to EU28. TFP annual growth rate: 1993-2002. Environmental indicators: EU15 for 2000 and EU28 for the most recent year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Belgium has set a 25% reduction target by 2030, using a 2005 baseline. Denmark has set a 55% reduction target by 2030, using a 1990 baseline. Germany set a reduction target of 31-34% by 2030, using a 1990 baseline. Portugal has set an 11% reduction target by 2030 using a 2005 baseline. Ireland has set a 22-30% reduction target by 2030 using a 2018 baseline.

[2] Also referred to as the June 2003 reform or the 2003 “Luxembourg” reform.

[3] Co-financing rates vary by measure and by Member State.

[4] Member States commonly have one national RDP, while some countries have regional RDPs. Belgium and Finland each have 2 RDPs, France has 30, Germany 13, Italy 33, Portugal 3 and Spain 19.

[5] Member States with average direct payment per hectare below 90% of the EU average can transfer up to 25% of rural development funds to direct payments.

[6] The following Member States have opted for transfers of funds from Pillar 1 to Pillar 2 throughout the CAP 2014-20 exercise: Belgium, the Czech Republic, Denmark, Estonia, France, Germany, Greece, Latvia, Lithuania, the Netherlands and Romania. In turn, Croatia, Malta, Hungary, Poland and the Slovak Republic chose to transfer funds from Pillar 2 to Pillar 1.

[7] The SAPS applies to all Member States joining since 2004 except Slovenia, Malta and Croatia, which implement the BPS with the EU15.

[8] The BPS is “regionalised” in four Member States – Greece (3 regions), Spain (50 regions), France (2 regions) and Finland (2 regions) – meaning that a different payment rate per hectare applies depending on the region. In Germany, regionalisation by Länder ceased to apply in 2019.

[9] Member States can choose their preferred method to calculate their SFS payments: lump-sum payment (an equal amount to all farmers in the scheme); payment due each year (individual farmers receive a single payment equivalent to what would have been due under other payment schemes); and payment due in 2015 (individual farmers receive a single payment that depends on the amount that would have been due in 2015). Member States that opt for the “payment due each year” method are not subject to the 10% maximum, provided they do not round up lower payment amounts to EUR 500 (USD 570). For more information, see (EC, 2017[61]).

[10] The criteria are low temperature, dryness, excess soil moisture, limited soil drainage, unfavourable texture and stoniness, shallow rooting depth, poor chemical properties, and slope.

[11] Payments are granted on a maximum number of hectares, which varies by country or region: Belgium (Wallonia), 30 ha; Bulgaria, 30 ha; Croatia, 20 ha; France, 52 ha; Germany, 46 ha with a higher per hectare payment rate for the first 30 ha; Lithuania, 30 ha; Poland, from 3 to 30 ha (with no payment below 3 ha); Portugal, 5 ha as from claim year 2017; and Romania, 30 ha with a smaller per hectare payment rate for the first 5 ha.

[12] Belgium (Wallonia), Croatia, France, Germany, Portugal and Romania.

[13] The Czech Republic, Denmark, Cyprus, Estonia, Finland, Latvia, Luxemburg, Malta, the Netherlands, Slovenia, Slovakia, Spain and Sweden.

[14] If the average market price in an EU country or in a region of an EU country drops below EUR 2 224 (USD 2 534) per tonne over a representative period, the European Commission may use public intervention to support beef prices (EC, n.d.[62]).

[15] In addition to the EAFRD, these include the European Regional Development Fund (ERDF), Cohesion Fund, European Social Fund (ESF), and the European Maritime and Fisheries Fund (EMFF).

[16] In 2020, an additional measure was added, M21: Exceptional temporary relief to farmers and SMEs active in processing, marketing and/or development of agricultural products particularly affected by the COVID-19 crisis.

[17] On 27 October 2021, the European Commission published on its first comprehensive annual report on implementation and enforcement of EU Trade Agreements (EC, 2021[60]). The 2021 report showed that EU exports have been boosted, thanks to stronger implementation and enforcement of trade deals and global rules. Agro-food trade with preferential partners grew by 2.2%, i.e. down from 8.7% in 2019, but twice as fast as overall agro-food trade (which grew by 1%). Agro-food exports under preferential agreements grew by 1.8%, while imports grew by 2.7% (EC, 2021[58]).

[18] On 26 January 2021, the European Commission published a study on cumulative impact of Free Trade Agreements (FTAs) in the EU agro-food sector (EC, 2021[59]), which showed the overall positive impact on the EU economy and the agro-food sector.

[19] The European Unions' National Determined contribution covers all 27 of its Member States.

[20] Emissions and removals from agricultural soils are covered under LULUCF.

[21] https://www.europarl.europa.eu/factsheets/en/sheet/106/financing-of-the-cap#:~:text=The%20EU%20budget%20for%202021%20contains%20a%20total,of%20the%202021%20EU-27%20budget%20%28EUR%2055.71%20billion%29.

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[23] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13223-Food-waste-reduction-targets_en.

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[25] https://www.bmel.de/EN/topics/animals/animal-welfare/state-run-animal-welfare-label-pigs.html.

[26] https://www.landwirtschaftsdaten.de/.

[27] https://climate-adapt.eea.europa.eu/.

[28] https://agriculture.gouv.fr/de-nouvelles-mesures-pour-renforcer-la-qualite-de-lalimentation-en-restauration-collective.

[29] See EU 2021/401 of 5 March 2021 and EU 2021/1458 of 7 September 2021.

[30] Agricultural Market Information System (AMIS) http://www.amis-outlook.org/.

13 Iceland

Support to agriculture

Iceland has seen limited reform to agricultural policies and support remains among the highest in the OECD. At 57% of gross farm receipts, the producer support estimate (PSE) was more than three times the OECD average in 2019-21. Market price support measures account for 50% of agricultural support, principally tariffs that maintain high domestic prices relative to world prices and cause a large transfer from consumers to agriculture producers. Market price support is complemented by payment entitlements directly or indirectly coupled with production factors. Output payments for milk producers and largely decoupled payments to sheep meat producers represent most of the remaining support to farmers. About 70% of farm support is potentially most-distorting to production and trade.

On average, effective prices received by farmers have declined over time, but remain almost double those in world markets. Poultry and egg products experienced the largest divergence between domestic and world prices in 2019-21. Market price support accounts for more than 71% of single commodity transfers (SCT) for these products. SCT represent 97% of total PSE.

Expenditures for general services (GSSE) relative to the value of agricultural production decreased from 8% in 1986-88 to 3% in 2019-21 because the value of production more than tripled while expenditures increased by around 70%. Over half of these are for inspection and control, with much of the rest devoted to public stockholding. Total support to agriculture (TSE) as a share of GDP declined significantly from 5% in 1986-88 to 1% in 2019-21.

Recent policy changes

The Agricultural Framework Agreement entered into force on 1 January 2021 and covers the general operating environment for the agricultural sector. One of the main elements of the revised Agreement is full carbon neutrality of Iceland's agriculture sector before 2040.

Several changes came into force in 2021 following the 2020 revision of the horticultural agreement. The revised agreement aims for a 25% increase in the domestic production of vegetables by 2024 and the inclusion of horticulture in the carbon neutrality goal for agriculture. Total annual support to horticulture farmers was increased by 25% to meet these goals. The main aims are to increase diversity in horticulture production, increase organic production and foster innovation.

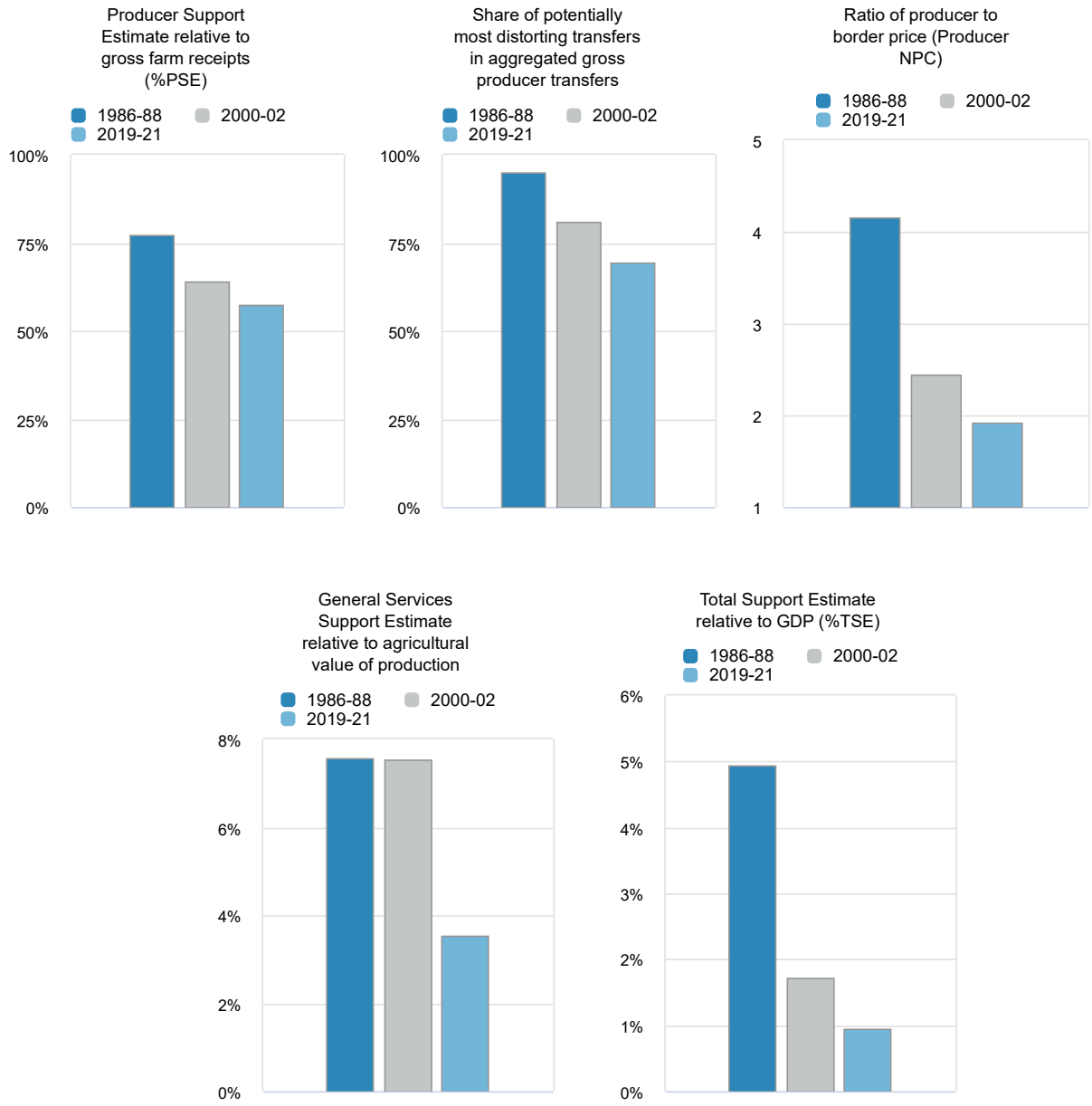
Assessment and recommendations

- Agriculture plays a central role in Iceland's climate policy and efforts to reach carbon neutrality. Agriculture represents a significant share of the country's GHG emissions, mainly due to the size of the livestock sector. Emphasis on measures to reduce GHG emissions from agriculture is key to Iceland's ambition for a low-carbon economy and will contribute to its challenging goal of carbon-

neutral agriculture before 2040. However, current agricultural support measures, especially market price support and output payments for ruminant products such as milk and wool, counteract and reduce the effectiveness of GHG mitigation measures in agriculture.

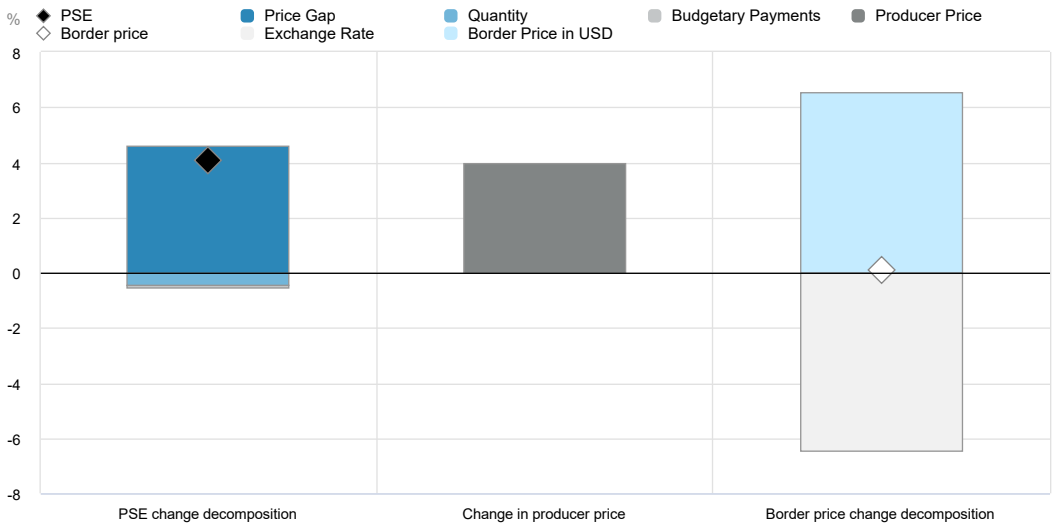
- Producer support should be decoupled from agricultural production and favour less production- and trade-distorting and less environmentally harmful forms of support. Re-instrumentation of producer support from production-coupled support measures towards decoupled support payments with environmental cross-compliance requirements, and towards specific agri-environmental measures, including GHG mitigation measures, would contribute to reaching agriculture's carbon neutrality target by 2040.
- In addition, shifting budget expenditure from producer support towards Iceland's agricultural innovation systems and other general services could increase innovations to enhance productivity and environmental sustainability performance in the agriculture sector.
- With the continued application of multi-year agreements between the government and the Farmers' Association, changes to overall agricultural policy are relatively limited and Iceland's support to farmers remains well above that of most OECD countries. Moreover, the largest part of support to farmers is dominated by production-coupled support measures, mainly market price support and output payments, which are the potentially most production- and trade-distorting, and environmentally harmful support measures.
- Despite progress reducing border protection for some agricultural products, import tariffs remain high for several groups, placing a burden on consumers and distorting associated markets.

Figure 13.1. Iceland: Development of support to agriculture



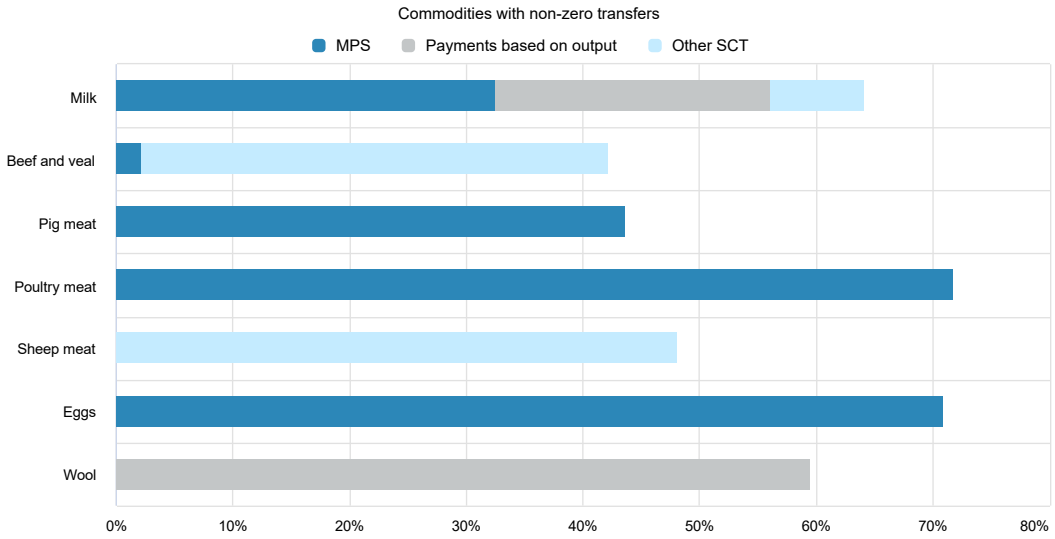
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 13.2. Iceland: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 13.3. Iceland: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 13.1. Iceland: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**236**	**150**	**273**	**280**	**256**	**283**
***of which:** share of MPS commodities (%)*	80.32	82.11	84.27	83.99	84.12	84.70
Total value of consumption (at farm gate)	**205**	**136**	**244**	**259**	**224**	**248**
Producer Support Estimate (PSE)	**193**	**139**	**218**	**222**	**205**	**228**
Support based on commodity output	180	113	149	150	140	158
Market Price Support[1]	179	72	110	109	102	118
Positive Market Price Support	179	72	110	109	102	118
Negative Market Price Support	0	0	0	0	0	0
Payments based on output	2	40	39	41	37	40
Payments based on input use	13	4	27	28	26	27
Based on variable input use	3	0	3	2	3	3
with input constraints	0	0	0	0	0	0
Based on fixed capital formation	6	2	20	21	19	20
with input constraints	0	0	0	0	0	0
Based on on-farm services	4	2	4	5	4	4
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	-1	-3	11	12	10	11
Based on Receipts / Income	-1	-3	0	0	0	0
Based on Area planted / Animal numbers	0	0	11	12	10	11
with input constraints	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	20	31	32	29	31
Payments based on non-current A/An/R/I, production not required	1	5	0	0	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	1	5	0	0	0	0
with commodity exceptions	1	5	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**77.19**	**63.98**	**57.25**	**56.50**	**57.22**	**57.99**
Producer NPC (coeff.)	**4.16**	**2.44**	**1.91**	**1.88**	**1.91**	**1.96**
Producer NAC (coeff.)	**4.38**	**2.78**	**2.34**	**2.30**	**2.34**	**2.38**
General Services Support Estimate (GSSE)	**18**	**11**	**10**	**10**	**9**	**9**
Agricultural knowledge and innovation system	5	5	1	1	1	1
Inspection and control	1	2	5	5	5	5
Development and maintenance of infrastructure	2	1	0	1	0	0
Marketing and promotion	1	1	0	0	0	0
Cost of public stockholding	9	2	3	3	3	3
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**6.94**	**7.39**	**4.22**	**4.43**	**4.38**	**3.87**
Consumer Support Estimate (CSE)	**-112**	**-65**	**-103**	**-106**	**-94**	**-109**
Transfers to producers from consumers	-157	-66	-103	-106	-94	-109
Other transfers from consumers	-1	-2	0	-1	0	0
Transfers to consumers from taxpayers	46	3	0	0	0	0
Excess feed cost	0	0	0	0	0	0
Percentage CSE (%)	**-70.44**	**-48.30**	**-42.33**	**-40.86**	**-42.10**	**-44.02**
Consumer NPC (coeff.)	**4.38**	**1.98**	**1.74**	**1.69**	**1.73**	**1.79**
Consumer NAC (coeff.)	**3.38**	**1.93**	**1.73**	**1.69**	**1.73**	**1.79**
Total Support Estimate (TSE)	**257**	**153**	**228**	**233**	**215**	**237**
Transfers from consumers	158	68	103	106	94	109
Transfers from taxpayers	100	87	125	127	121	128
Budget revenues	-1	-2	0	-1	0	0
Percentage TSE (% of GDP)	**4.94**	**1.72**	**0.95**	**0.94**	**0.99**	**0.94**
Total Budgetary Support Estimate (TBSE)	**78**	**81**	**118**	**124**	**113**	**119**
Percentage TBSE (% of GDP)	**1.52**	**0.91**	**0.49**	**0.50**	**0.52**	**0.47**
GDP deflator (1986-88=100)	**100**	**264**	**618**	**597**	**616**	**642**
Exchange rate (national currency per USD)	**40.94**	**89.37**	**128.32**	**122.64**	**135.38**	**126.95**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Iceland are: milk, beef and veal, sheep meat, wool, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Iceland's agricultural policy focuses on food security, safety and quality; strengthening rural activity; environmental sustainability; and maintaining farm income.

Iceland supports agriculture heavily and reforms over time have been limited. Support consists mainly of price support sustained with border measures and quotas. Dairy producers receive payments based on output. In 1996, support to sheep meat producers changed from price support to direct payments based on historic entitlements. A regional scheme for sheep farmers implemented in 2008 provides additional direct payments based on historic entitlements. Individual non-transferrable quotas for milk producers were introduced in 1980 and went through a number of reforms. In 1992, the current system of freely transferable quotas was introduced, and production-based payments were linked to the quota, paid directly to the farmer.

Since the mid-1990s, tariffs on agricultural products were reduced. However, tariffs on several agriculture product groups, particularly meat, dairy and flowers, remain high and complicated. A large number of compound duties with both *ad valorem* and specific duties apply. Export subsidies for agricultural products have not been provided since the early 1990s.

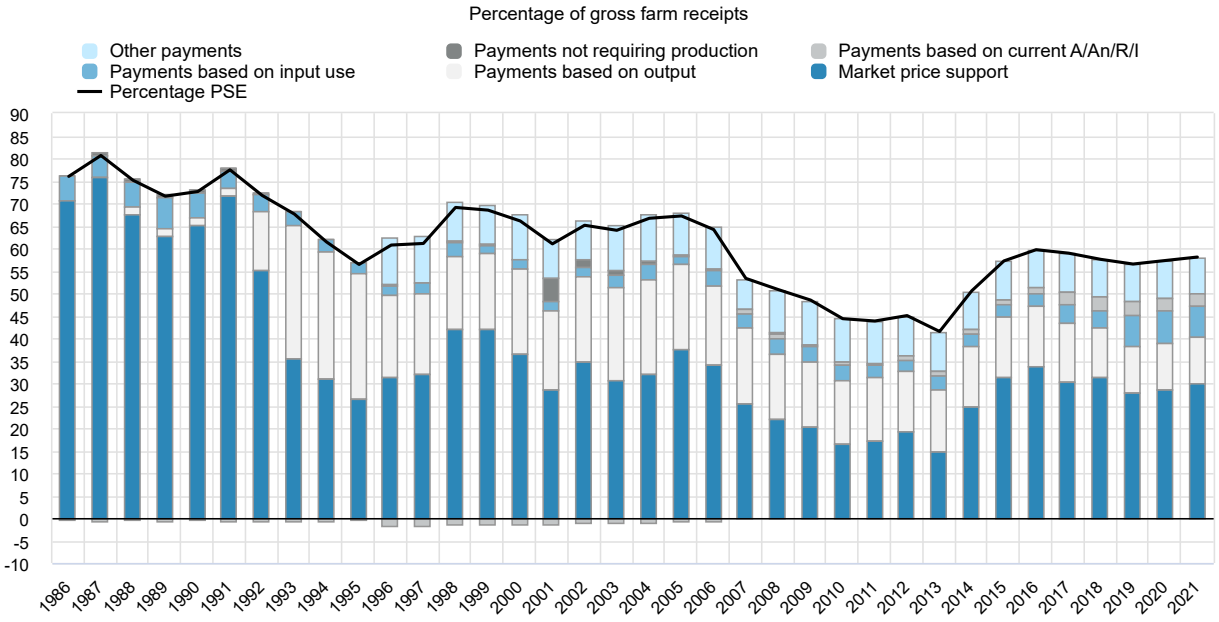
Table 13.2. Iceland: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to mid-1990s	Closed economy	Minimum prices Agricultural tariffs and non-tariff measures Consumer subsidies
Mid-1990s-2016	Gradual reforms to open market	EFTA, EEA Phase out of administered prices (except milk) Decoupled payments introduced to substitute price support measures Act Production, Pricing and Sale of Agricultural Products No. 99/1993 Act on Agriculture No. 70/1998
2017-present	Continuation of gradual reforms	Revisions of agreements for sheep and cattle farmers Several FTAs signed EEA agreement enhanced Reduction of agricultural tariffs

The policy mix remains dominated by production- and trade-distorting measures. Iceland continues to provide agricultural support through market price support maintained by border measures, and through direct payments based on entitlements directly or indirectly coupled with production.

Support to producers declined since the mid-1980s. An important reduction in market price support took place at the beginning of the 1990s, but market price support still accounts for around half of total support to agriculture. More than two-thirds of producer support is provided based on prices (Figure 13.4). TSE has declined over time, averaging 1% of the country's GDP in recent years, with PSE being the dominant component at 95%. The remaining TSE is financing for GSSE, almost half of which comprises expenditures for inspection, with public stockholding expenditures responsible for much of the remainder.

Figure 13.4. Iceland: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The objective of Iceland's agricultural policy is to maintain and strengthen a diverse agricultural sector to the extent that physical and marketing conditions allow. The key goals are to: meet domestic demand where realistically possible; maintain sustainable production of high-quality, healthy products; improve efficiency and competitiveness; improve farmers' incomes; foster innovation and create job opportunities; and sustain livelihoods in rural areas.

Agricultural policies in Iceland are based on two legal instruments. First, the policy concerning production and marketing of agricultural products (laid out in the Act on the Production, Pricing and Sale of Agricultural Products No. 99/1993) establishes objectives for Iceland's agricultural policy and provides the framework for Icelandic agriculture and its regulation. The second legal instrument concerns policies for the provision of support to farm construction projects, livestock improvement and extension (advisory) services (laid out in Act on Agriculture No. 70/1998).

The government negotiates with the Farmers' Association concerning the general framework for support and production control in the cattle, sheep and horticultural sectors. There is also an agreement on so-called horizontal support, such as advisory services, breeding, animal welfare, environmental protection, sustainable land management, organic farming and land cultivation. The current agreements cover 2017-26, with extensive reviews in 2019 and again in 2023. Changes in 2019 to the agreements for sheep farming and cattle entered into force on 1 January 2020. In 2020, the agreements on horticulture and the framework agreement (horizontal support) of agriculture were revised and the new agreements all entered into force on 1 January 2021.

Iceland's agricultural support comes through price support (maintained by border measures), and direct payments based on payment entitlements coupled with production factors. Price support is provided for all livestock products and some horticultural products. Direct payments are provided to cattle (mainly dairy) and sheep producers, and on a smaller scale, to certain greenhouse producers.

For dairy, direct payments depend on the size of a producer's quota and the current number of animals. Headage payments are provided for up to 180 dairy cows and 260 beef cows per farm, with full payment for each of the first 50 dairy cows and 200 beef cows, then at a declining rate for each additional cow. The Ministry of Fisheries and Agriculture sets a national dairy production quota divided among producers based on their annual quotas for the preceding year. Annual dairy quotas also determine entitlements for direct payments. Production in excess of quotas is permitted, provided all such production is for export. Wholesale prices are regulated for approximately half of all dairy products based on the volume of raw milk required. A government-chaired committee representing both the Farmers' Association and the labour union (acting on behalf of consumers) determines the guaranteed minimum prices for milk delivered within production quotas on an annual basis. Trade in support entitlements (basic payments to all active dairy and cattle farmers) between entitlement holders is allowed with quantity limitations and takes place in a market operated by the government. Dairy producers also benefit from support for breeding, land cultivation and development programmes.

For sheep, direct payments link to entitlements based on historical production. However, eligibility to receive full payments requires keeping a minimum number of winter-fed sheep on the farm. Additional payments to sheep farmers relate to a quality-control scheme for lamb meat based on animal welfare, product quality, traceability and sustainability criteria. Premium payments are provided at the wholesale level for purchasers of wool, and to farmers to co-operate in increasing added value for sheep products.

Imports of meat, dairy products, and some vegetables that compete with domestic production are subject to tariffs, often compound duties with an *ad valorem* component of 30% and a specific duty that varies from ISK 5/kg (USD 0.04/kg) to ISK 1 462/kg (USD 2/kg). However, products originating in partner countries of the European Economic Area (EEA) or in one of the 41 countries with which Iceland has free trade agreements may carry lower tariffs. The agreement for the cattle sector includes a provision to change the specific duties for certain cheese and milk powder products based on changes in the Special drawing rights to Kronoa (SDR/ISK) exchange rate from 1995 to 2016, effective 1 March. Since then, the specific component was adjusted annually to the 12-month evolution of SDR/ISK.

Iceland is a member of the European Economic Area (EEA) and of the European Free Trade Association (EFTA). While the EEA Agreement does not apply to most trade in agricultural goods, it opens trade in several processed agricultural products and encourages bilateral agreements on primary commodities.

As a member of EFTA, Iceland is also party to several Free Trade Agreements (FTAs), including with countries in Southeast Europe, North Africa and the Middle East, Latin America, and Asia, as well as with the South African Customs Union. In addition, Iceland has bilateral FTAs with the Faroe Islands, Greenland, and the People's Republic of China.

Climate change mitigation policies in agriculture

Agriculture represents a significant share of Iceland's GHG emissions – 13.1% in 2019, well above the OECD average of 9.5% – mainly due to the size of the livestock sector. Methane emissions from enteric fermentation and manure management, and nitrous oxide emissions from manure management and application of fertilisers historically account for over 99% of emissions from agriculture, with less than 1% from carbon dioxide.

According to Iceland's Nationally Determined Contributions (NDC) submitted to the UNFCCC under the Paris Agreement on Climate Change, Iceland aims to be part of European countries' collective 40% reduction in GHG emissions compared to 1990 levels by 2030. A precise commitment for Iceland within

this delivery has yet to be determined and depends on agreement with the European Union and other countries. Iceland's participation in the EU Emissions Trading System will be key in this regard, considering that almost half of Iceland's emissions would be regulated through this scheme. In December 2020, Iceland's prime minister introduced a new target 55% reduction in GHG emissions by 2030. The government plans to make the economy largely carbon-neutral by 2040.

Revisions of the Agricultural Framework Agreement took place in 2020. The revised agreement entered into force on 1 January 2021 and includes a goal of carbon-neutral agriculture by 2040 and increased emphasis on environmental issues and climate change. The agreement states that elements of a new agriculture policy for the future would be the foundation for fundamental changes in the next revision process, anticipated in 2023.

Iceland's 2020 Climate Action Plan contains five actions for agriculture. These include: improved utilisation and handling of fertilisers by reducing the use of mineral fertilisers; improved livestock feeding to reduce enteric fermentation; increased domestic vegetable production; carbon neutrality in cattle breeding; and implementing a project called Climate-Friendly Agriculture. This project provides comprehensive advice and education to farmers with the aim of reducing GHG emissions from agriculture and land use. The project started in February 2020 and continued with new participants in 2021.

In October 2019, the European Union, Iceland and Norway formally agreed to extend their climate co-operation for 2021-30 by including the Effort Sharing Regulation and the Regulation on GHG Emissions and Removals From Land Use, Land Use Change and Forestry (the LULUCF Regulation), into the EEA Agreement. According to the agreement, Iceland is to fulfil its GHG emission reduction target for 1 January 2021 to 31 December 2030 in accordance with the ETS-directive, LULUCF Regulation and the Effort Sharing Regulation.

Domestic policy developments in 2021-22

The revised Agricultural Framework Agreement entered into force on 1 January 2021 covering the general operating environment for the agricultural sector. Main elements of the revised Agreement include full carbon neutrality of Iceland's agriculture before the year 2040 and a consensus that a new agricultural policy will be the basis for the second revision phase in 2023.

Several changes came into force in 2021 following the 2020 revision of the horticultural agreement. The main goals of the revised agreement are to increase by 25% of domestic production of vegetables by 2024 and that horticulture will be carbon neutral in 2040. Total annual support to horticulture farmers was increased by 25% to meet these goals. The aim is, among other things, to increase diversity in horticulture, increase organic production and innovation.

The milk production quota was set at 145 million litres in 2021 but will be increased to 146.5 million litres in 2022. Production in excess of the quota must be exported. Payments to farmers are made in equal monthly payments of one-twelfth of the annual quota. In 2021, the minimum farm gate price for milk delivered within the production quota was set at ISK 100.5 (USD 0.80) per litre.

A proposal for a new and extensive agriculture policy was formed in 2020-21. Parliament is expected to approve this in 2022, resulting in a public policy for the agricultural sector until 2040. The proposal contains nineteen topics, including organic agriculture, environmental issues, biodiversity, education, the Fourth Industrial Revolution (4IR), and innovation. The key objectives of the policy proposal are to enhance food security, sustainable land use, increased value creation and competitiveness on the basis of science and latest technology and to promote thriving agriculture throughout the country.

A new fund (*Matvaelasjodur*) was established as part of the Agricultural Productivity Fund, in order to further strengthen research and development in food production and food processing. Grants from the fund are not limited to primary agriculture production but are intended to stimulate innovation in food production

in general. Emphasis is on innovation, sustainability, value creation and competitiveness. The fund is specifically designed to help to meet the SDG of the United Nations.

Trade policy developments in 2021-22

In 2021, Iceland, Liechtenstein and Norway (EEA-EFTA countries) completed negotiations for an FTA with the United Kingdom. The United Kingdom is an important trade partner for Iceland and the ambitious and comprehensive agreement covers trade in goods and services. In essence, the agreement ensures that the terms of trade Iceland had with the United Kingdom when it was an EU Member, will remain unchanged. Iceland will grant tariff quotas for cheese and processed meat products and receives tariff quotas for lamb meat and *skyr* (a thick and creamy Icelandic yogurt made from skim milk).

In 2021, the government introduced a new digital tariff quota allocation system. The system is supposed to facilitate importers to apply for TRQs. Also, the TRQ between Iceland and the European Union was fully implemented after four years of staging.

Contextual information

Iceland is a small, sparsely populated country with a GDP per capita above the OECD average. Agriculture contributes about 5% of GDP and 4% of employment. Conditions for agriculture in Iceland are limited by the country's geographical conditions. The growing season is short – around four months – yields are low, and production and transport costs are high. Approximately one-fifth of the total land area of Iceland is agricultural land, mostly suitable for fodder production and livestock raising. Only around 6% of agricultural land area is arable land.

Livestock-rearing is the main farm activity, with milk and sheep meat being the most important products. Livestock production is mostly grassland-based and most farm animals are native breeds. The main crops are hay, cereals for animal feed and vegetables – the latter are cultivated primarily in greenhouses heated with geothermal energy. The main agricultural exports are pure-bred horses for breeding, sheep meat products and fur skins. The range of Iceland's agricultural products is limited and meets approximately 50% of total domestic food requirements. Consequently, Iceland is a net importer of agricultural products (excluding fishery goods), mainly for final consumption. Imports are more diversified than exports, and have increased steadily in recent years.

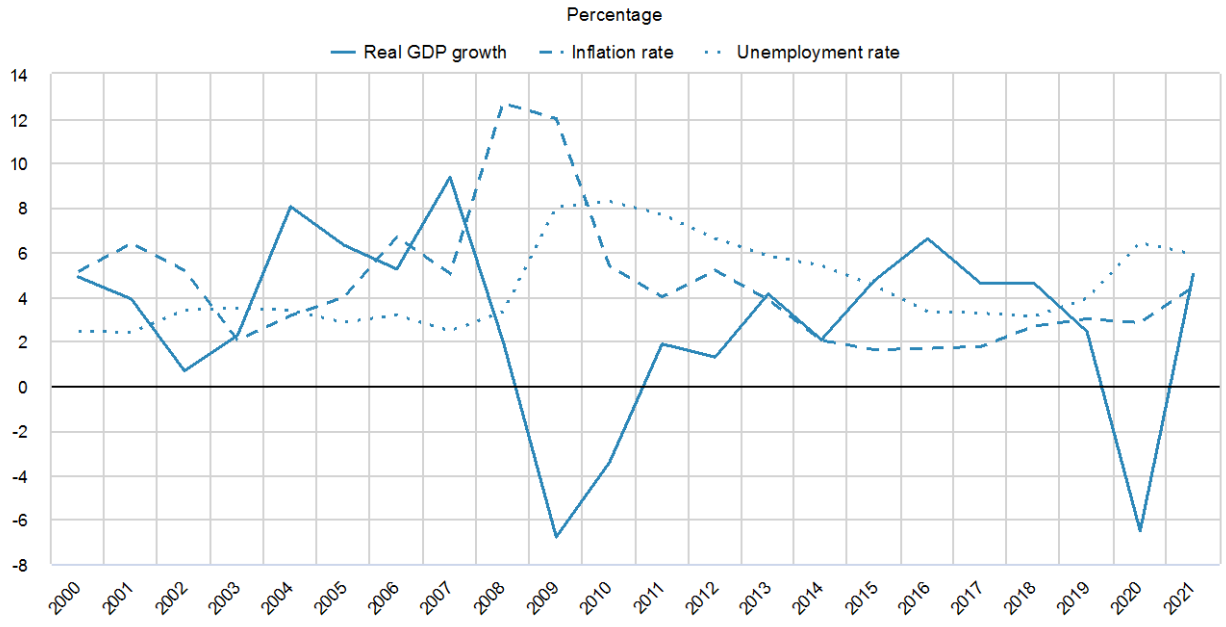
Iceland's economy is recovering from a deep recession caused by the COVID-19 pandemic. The economy is projected to grow by 5.2% in 2022 and 4% in 2023**,** driven by rebounding foreign tourism and robust goods exports, and the unemployment rate is expected to be around 7% in 2022 on the back of accelerating growth (OECD, 2021[1]). Iceland's prosperity has been built on the sustainable management of its abundant natural resources, including the comprehensive fisheries management system based on individual transferable quotas, renewable energy (geothermal and hydro) and carbon sequestration opportunities (afforestation, revegetation).

Table 13.3. Iceland: Contextual indicators

	Iceland		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	8	20	0.02%	0.02%
Population (million)	0.3	0.4	0.01%	0.01%
Land area (thousand km²)	100	101	0.12%	0.12%
Agricultural area (AA) (thousand ha)	1 889	1 872	0.06%	0.06%
			All countries[1]	
Population density (inhabitants/km²)	3	4	53	63
GDP per capita (USD in PPPs)	29 793	55 213	9 281	20 929
Trade as % of GDP	25	24	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	8.1	4.8	2.9	4.9
Agriculture share in employment (%)	8.3	4.0	-	-
Agro-food exports (% of total exports)	7.9	5.3	6.2	8.5
Agro-food imports (% of total imports)	7.3	12.0	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	15	14	-	-
Livestock in total agricultural production (%)	85	86	-	-
Share of arable land in AA (%)	7	6	32	34

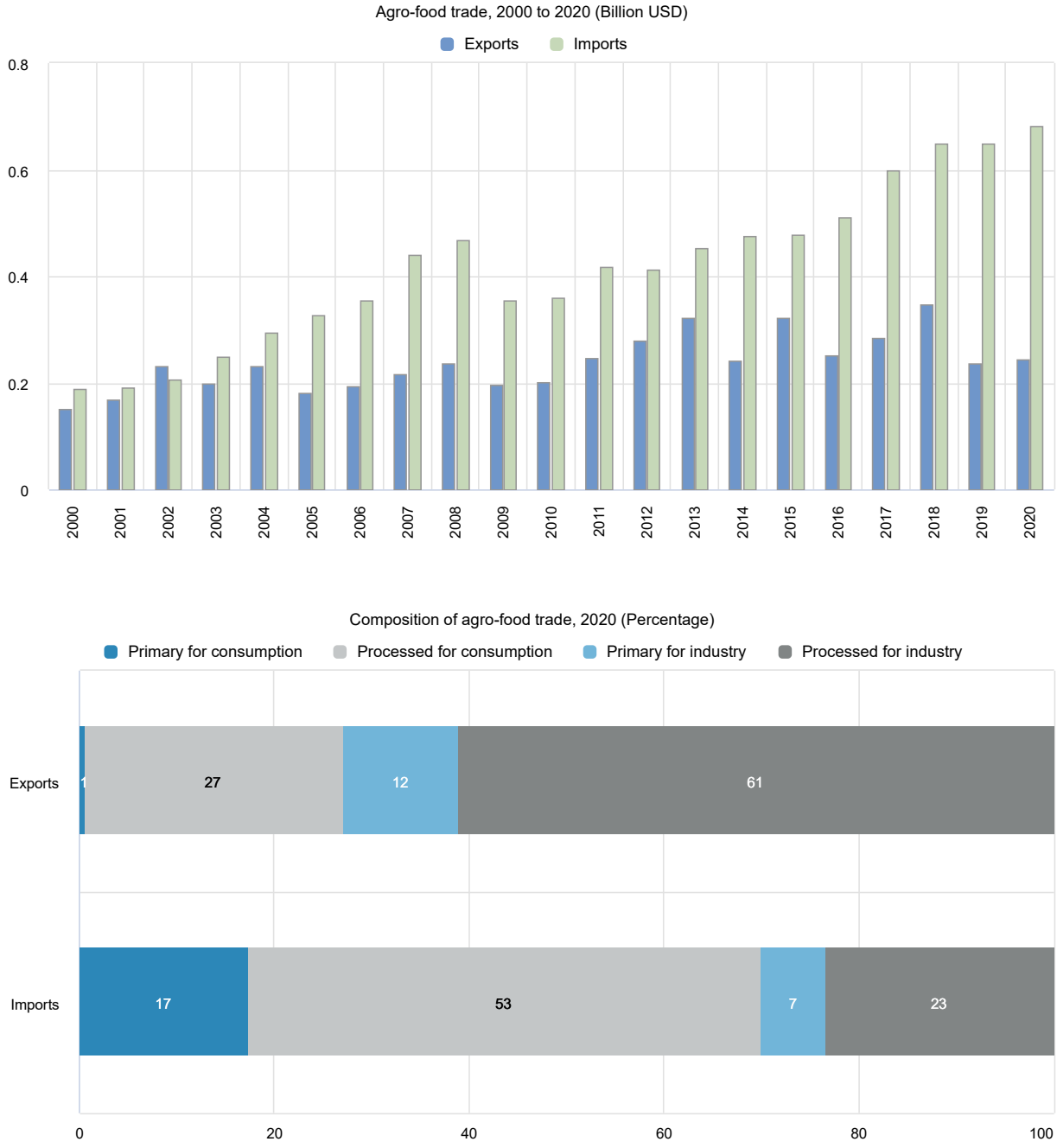
Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 13.5. Iceland: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 13.6. Iceland: Agro-food trade

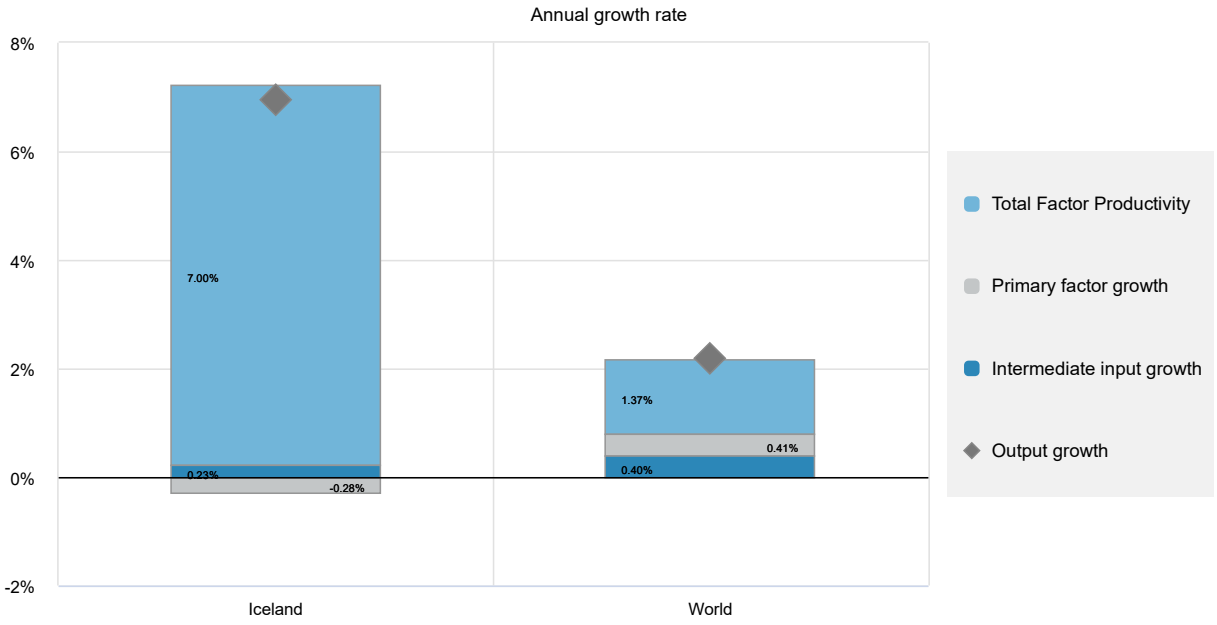


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Output growth in agriculture (7%) has clearly outpaced the global average (2%) over the 2010-19 period, which has been driven by commensurately robust growth in total factor productivity (TFP) of 7% per year – which was also much higher than the global average rate of 1.4%. This is mostly related to a significant output growth in aquaculture and much less so in crop and animal output. At the same time input growth has decreased.

A harsh climate, lack of suitable land, small average farm size, and the narrow genetic base for traditional livestock present significant constraints to the sector. Due to its relatively low livestock densities, Iceland's nutrient balances show a comparatively small surplus of both nitrogen and phosphorus. Iceland has the lowest pesticide sales per hectare in the OECD area and the sector's share of energy use has fallen over time. Agriculture continues to represent a significant share in the country's total GHG emissions – well above the OECD average – mainly due to the importance of the ruminant livestock sector. Emissions of CH_4 emissions from enteric fermentation and manure management, and N_2O emissions from manure management and fertilisers have historically accounted for over 99% of the total emissions from agriculture, with less than 1% arising from CO_2. With abundant water and a small population, total water abstraction in Iceland is less than 1% of total available freshwater resources. This is one of the lowest intensities of water resource use in the OECD, although the freshwater abstractions per capita are the highest in the OECD area (OECD, 2019[2]). The share of agriculture in total water abstractions has decreased over the past two decades.

Figure 13.7. Iceland: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 13.4. Iceland: Productivity and environmental indicators

	Iceland		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.7%	7.0%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	8.0	7.2	32.1	30.0
Phosphorus balance, kg/ha	1.8	1.3	3.4	2.9
Agriculture share of total energy use (%)	1.9	1.3	1.7	2.0
Agriculture share of GHG emissions (%)	15.1	13.1	8.6	9.7
Share of irrigated land in AA (%)	..	..	-	-
Share of agriculture in water abstractions (%)	42.9	22.3	46.3	43.7
Water stress indicator	0.1	1.8	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

OECD (2021), *OECD Economic Surveys: Iceland 2021*, OECD Publishing, Paris, https://doi.org/10.1787/c4edf686-en. [1]

OECD (2019), "Water: Freshwater abstractions (Edition 2018)", *OECD Environment Statistics* (database), https://doi.org/10.1787/09a848f4-en (accessed on 7 April 2022). [2]

14 India

Support to agriculture

Support to producers in India includes budgetary spending corresponding to 9.6% of gross farm receipts, positive market price support (MPS) of +1.7% of gross farm receipts for commodities that are supported and negative MPS to -18.5% for those that are taxed. Overall, this led to negative net support of -7.2% of gross farm receipts in 2019-21, against a backdrop of increasing prices at the border for the exported commodities covered.

Support to producers has been negative throughout the last two decades, but fluctuates markedly. The negative producer support estimate shows that domestic producers have been implicitly taxed on average, as budgetary payments to farmers did not offset the price-depressing effect of complex domestic marketing regulations and trade policy measures. Virtually all gross producer transfers (whether positive or negative) come in potentially most production- and trade-distorting forms – a consistent pattern since 2000-02.

Single commodity transfers (SCT) follow the overall MPS pattern, but vary by commodity. Most commodities were implicitly taxed by between 5% and 91% of commodity receipts in 2019-21. Commodities with positive SCTs, ranging between 6% and 23% of commodity receipts in the same period, include sugar, chickpeas, other pulses and poultry meat.

Budgetary transfers to producers are dominated by subsidies for variable input use, such as fertilisers, electricity and irrigation water. However, budgetary allocations to the direct income transfer programme, PM-KISAN, have been increasing since its implementation in 2018.

Public expenditures financing general services to the sector (GSSE), principally for infrastructure-related investments, are around half the level of subsidies for variable input use. At 4% in 2019-21, expenditure for GSSE relative to the value of agricultural production increased compared to 2000-02.

Mirroring the farm-price-depressing effect on producers throughout the period covered, policies provide implicit support to consumers. Policies that affect farm prices, along with substantially increased food subsidies under the Targeted Public Distribution System during the COVID-19 pandemic, reduced the costs for consumers, with a consumer support estimate of 36% of expenditure on average across all commodities in 2019-21. Total budgetary support is estimated at 2.6% of GDP in 2019-21, contributing to an overall positive total support estimate (TSE) of 0.9% of GDP.

Recent policy changes

On 29 November 2021, the parliament approved a bill withdrawing the three laws aimed at reforming agricultural markets, which was initially endorsed in September 2020. The laws were intended to allow farmers sell their products outside of government-regulated markets, removing limits on private stocking, trading or buying of agricultural commodities, to promote barrier-free inter- and intra-state trade.

The government raised the minimum support prices (MSP) for summer planted (*kharif*) crops in mid-2021. This included an increase of 2% for soybeans and sunflower MSPs, 3.9% for rice, and 1.1% for maize. The central government also raised the MSPs for winter planted (*rabi*) crops in September 2021. This included an increase of 7.8% for lentils MSP, 2.5% for chickpeas, 2% for wheat, 2.2% for barley, and 8.6% for rapeseed. The government allocated INR 286 billion (USD 3.8 billion) more for fertiliser subsidies to offset an increase in international prices for fertilisers in October 2021.

The government extended the *Pradhan Mantri Garib Kalyan Anna Yojana* (PMGKAY) food distribution programme to November 2021 in response to the second wave of the COVID-19 pandemic.

As part of the drive to enhance self-sufficiency and reduce the vegetable oil imports bill, India announced an INR 110 billion (USD 1.48 billion) plan (the National Mission on Oilseeds and Oil Palm) in July 2021 to enhance domestic production and productivity of oilseeds, palm oil and pulses. Support will be granted for the purchase of higher quality seeds, tools and machinery; plant protection equipment, chemicals and fertilisers; and targeted infrastructure, technology transfer, extension and training.

Several measures were taken to reduce trade barriers. The Ministry of Commerce and Industry removed selected pulses from the list of import quotas in May 2021, with effect until November 2021. In July 2021, the Ministry of Finance temporarily eliminated tariffs applied to lentils. In October 2021, the government suspended tariffs on crude palm oil, crude soybean oil, and crude sunflower oil until 31 March 2022. In May 2021, the Ministry of Consumer Affairs reduced the sugar export subsidy by 33% to INR 4 000 (USD 55) per tonne. The notified rate affects contracts signed between sugar mills and exporting parties on or after 20 May 2021. The gradual reduction in export subsidies aims to accelerate diversion of sugar toward ethanol production in support of increasing the blending rate to 20% by 2025.

The Union Budget 2021-22 includes new general services programmes targeting pest and disease inspection and control as well as storage, marketing and infrastructure. The Union Budget 2022-23, released in February 2022, introduces measures to improve financial services to farmers. A new fund will be set up for 2022-23 through the National Bank for Agriculture and Rural Development to finance start-ups in agriculture and other rural enterprises. New programmes will focus as well on digitalisation in agriculture, marketing and extension services. The Union Budget 2022-23 also foresees providing direct payments to wheat and rice farmers of INR 2.4 trillion (USD 31.2 billion) of MSP value from April 2022 to March 2023.

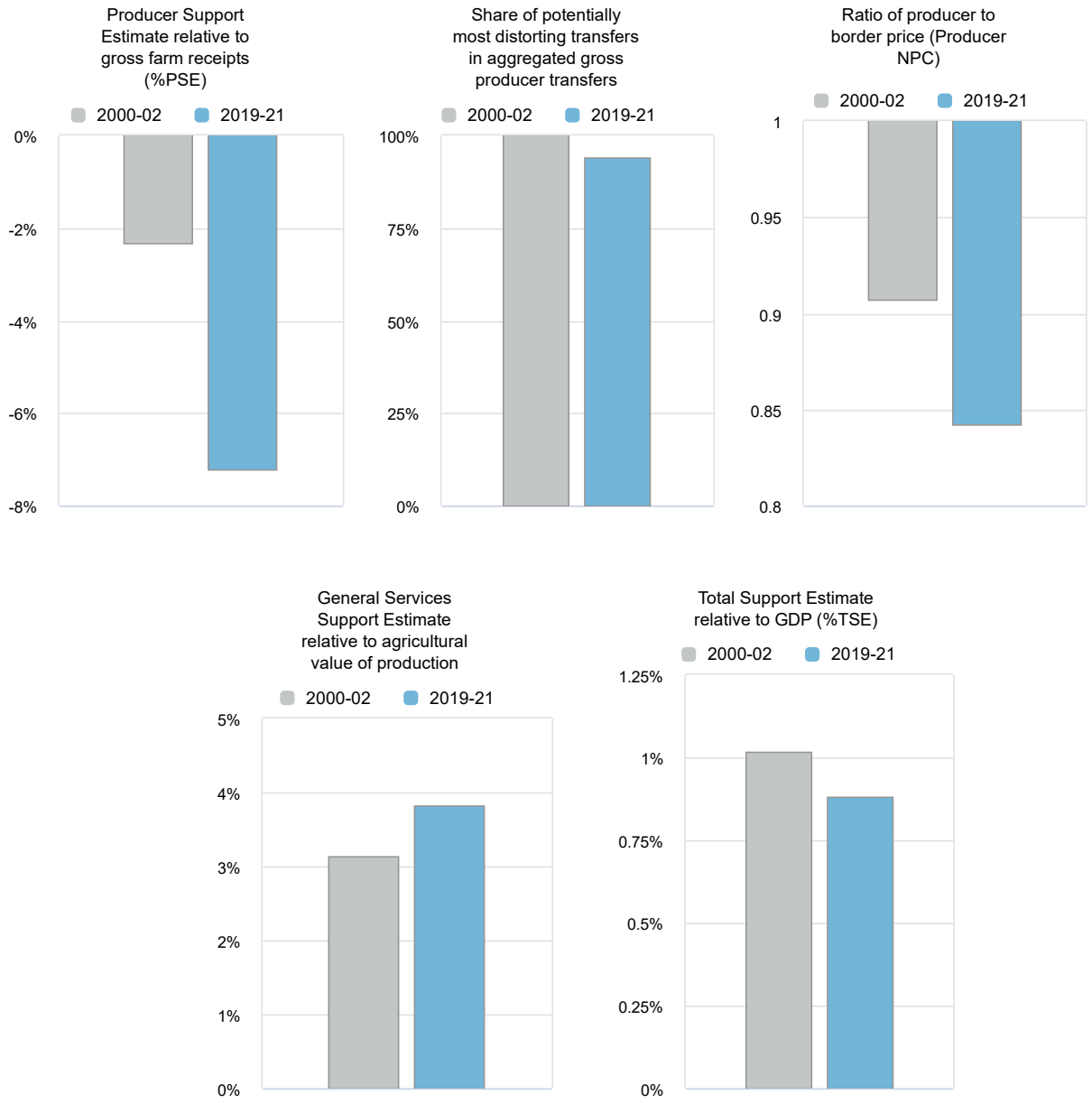
Assessment and recommendations

- India's Nationally Determined Contribution (NDC) includes an economy-wide emission intensity reduction target, but no sector-specific targets. Nevertheless, several sector-specific programmes aim to mitigate greenhouse gas (GHG) emissions by promoting energy conservation, alternative fuels from renewable technologies, water conservation, afforestation, land and waste management, increased fertiliser efficiency, crop diversification, lower methane emission rice production, and avoiding crop residue burning.
- Agriculture support could also be further aligned with GHG mitigation efforts. In particular, scaling back variable input subsidies (fertiliser, irrigation water and electricity) can directly lower GHG emissions. Possible savings from such reduction could be applied to train farmers to use such inputs more efficiently and sustainably by ensuring that extension systems focus on climate change, sustainability, digital skills, and resilience more broadly.
- Greater emphasis on general services can boost needed investment in agricultural research and development and innovation. In particular, increased investments in the agricultural knowledge system and knowledge transfer through Farmer Producer Organisations can ensure sustained and sustainable productivity growth. Promoting new technologies and production practices is important

for GHG emission reduction in the livestock sector, the primary contributor to GHG emissions in India.

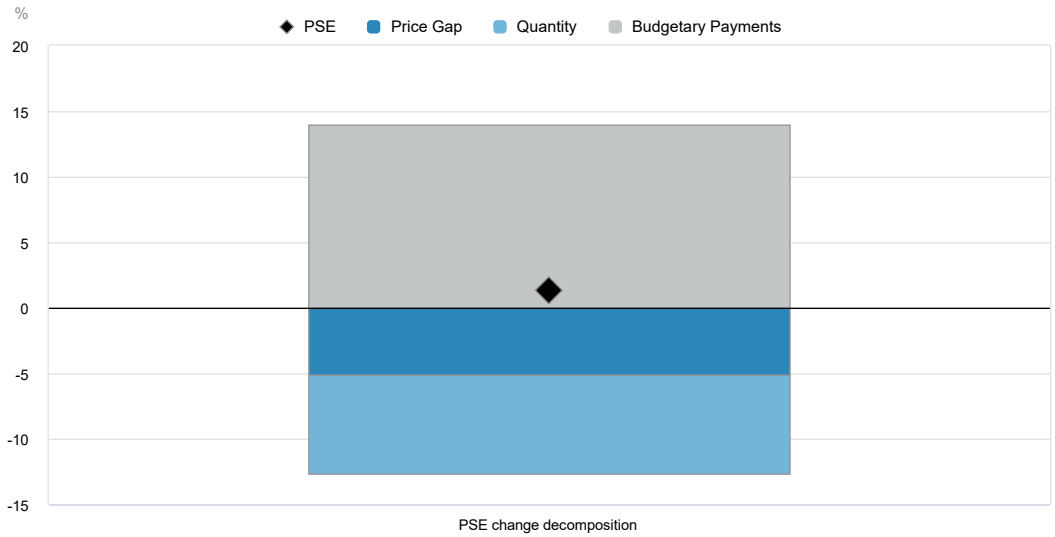
- Due to a combination of restrictive domestic marketing policies and border measures for many products and over most of the period reviewed, Indian farmers have been receiving prices lower than those prevailing on international markets. Despite the repeal of laws promoting country-wide reforms of agricultural marketing regulations, further developing the electronic National Agricultural Market (e-NAM), set up in 2016, should remain a priority. In addition, the 2017 model Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act should continue being implemented in a more harmonised and consistent way across states. These initiatives can foster more efficient markets and competitive agri-food supply chains across states, and should be synchronised through coherent plans with reforms to the minimum support price system. They need to be complemented with investments in infrastructure, marketing, training and other general services to agriculture for farmers to reap the benefits in productivity and income. The budgetary allocations for rural infrastructure in the 2021 and 2022 Union Budgets are positive steps in this direction.
- The large share of employment in agriculture compared to its GDP contribution reflects the persistent labour productivity gap with other sectors and translates into low farm incomes. In the short to medium term, direct cash transfers (such as through PM-KISAN) to incomes of the poorest farmers can support their livelihoods as well as adjustment to new market conditions. In the long term, policies are needed to facilitate significant structural adjustments, including the transition of farm labour to other activities and consolidation towards sufficiently large farm operations to exploit economies of scale. Continued reforms to land regulations will be more effective if complemented by increased investments in key public services to the sector, such as education, training and infrastructure, and in a broader enabling environment, including financial services.
- India is an important exporter in a number of agri-food markets. The Agricultural Export Policy (AEP) framework adopted in 2018 was important to reduce uncertainty and transaction costs throughout supply chains by helping to avoid export restrictions on organic and processed agricultural products. However, recent export restrictions on products such as onions directly affect India's reliability as a supplier and exacerbate the persistent challenge of low farm incomes. An extension of the AEP to all agri-food products should be considered to create a stable and predictable market environment.
- Recent reductions in tariffs and relaxation of quantitative restrictions on selected pulses, albeit temporary, are additional positive steps to improve food security and diversify diets. Together with domestic marketing reforms, easing export and import restrictions would make the market more predictable and raise incentives for producers and traders to invest in supply chains.
- India has made significant progress in recent years in eliminating inefficiencies in the food distribution system, and these efforts should continue. The experimental replacement of physical grain distribution by direct cash transfers should be expanded, with some adjustments in light of experiences gained.

Figure 14.1. India: Development of support to agriculture



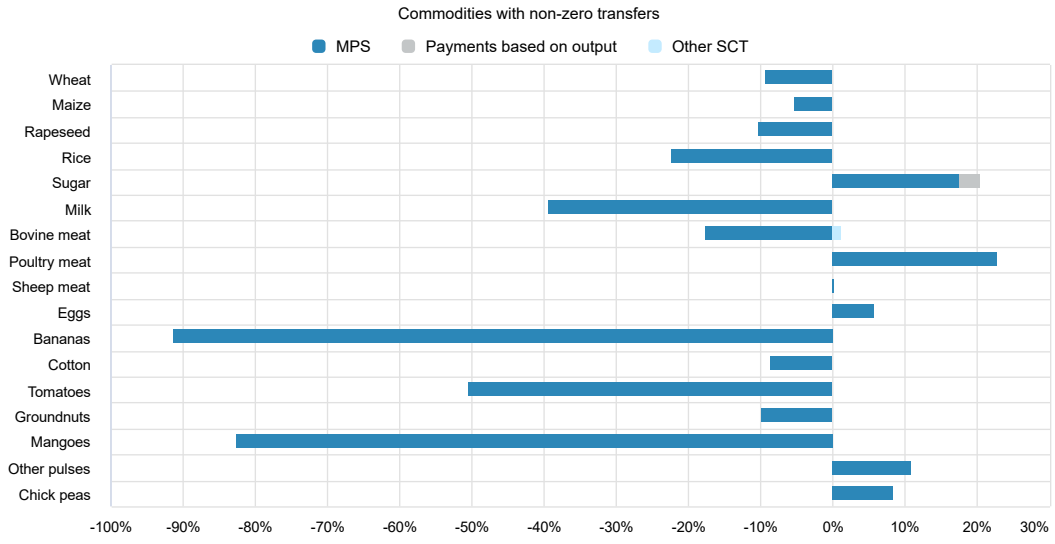
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 14.2. India: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 14.3. India: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 14.1. India: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**112 282**	**444 437**	**448 408**	**428 897**	**456 007**
***of which:** share of MPS commodities (%)*	64.75	75.68	72.98	77.20	76.87
Total value of consumption (at farm gate)	**109 060**	**378 202**	**368 636**	**363 039**	**402 931**
Producer Support Estimate (PSE)	**-2 709**	**-35 264**	**-23 079**	**-41 481**	**-41 231**
Support based on commodity output	-11 243	-82 339	-64 050	-88 352	-94 616
Market Price Support[1]	-11 243	-82 753	-64 339	-88 996	-94 923
Positive Market Price Support	3 583	8 228	13 014	7 458	4 213
Negative Market Price Support	-14 827	-90 981	-77 354	-96 454	-99 136
Payments based on output	0	413	290	644	307
Payments based on input use	8 519	38 642	33 720	38 467	43 739
Based on variable input use	8 519	38 177	33 258	38 016	43 257
with input constraints	0	0	0	0	0
Based on fixed capital formation	0	412	424	397	414
with input constraints	0	0	0	0	0
Based on on-farm services	0	53	38	54	68
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	0	0	0	0
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	8 059	6 889	8 182	9 107
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	8 059	6 889	8 182	9 107
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	15	374	362	222	539
Percentage PSE (%)	**-2.31**	**-7.21**	**-4.71**	**-8.71**	**-8.09**
Producer NPC (coeff.)	**0.91**	**0.84**	**0.88**	**0.83**	**0.83**
Producer NAC (coeff.)	**0.98**	**0.93**	**0.96**	**0.92**	**0.93**
General Services Support Estimate (GSSE)	**3 526**	**17 012**	**16 014**	**16 524**	**18 499**
Agricultural knowledge and innovation system	402	1 208	1 346	1 090	1 188
Inspection and control	25	391	427	377	369
Development and maintenance of infrastructure	2 021	14 399	13 126	14 104	15 967
Marketing and promotion	14	26	59	6	12
Cost of public stockholding	1 044	980	1 042	941	958
Miscellaneous	21	8	14	6	4
Percentage GSSE (% of TSE)	**..**	**..**	**..**	**..**	**..**
Consumer Support Estimate (CSE)	**14 692**	**115 639**	**75 351**	**150 272**	**121 293**
Transfers to producers from consumers	10 856	72 759	57 985	77 204	83 087
Other transfers from consumers	-224	-35	-76	-17	-11
Transfers to consumers from taxpayers	4 222	43 611	16 831	74 000	40 001
Excess feed cost	-163	-696	612	-915	-1 784
Percentage CSE (%)	**14.12**	**34.80**	**21.42**	**51.99**	**33.42**
Consumer NPC (coeff.)	**0.91**	**0.84**	**0.86**	**0.82**	**0.83**
Consumer NAC (coeff.)	**0.88**	**0.74**	**0.82**	**0.66**	**0.75**
Total Support Estimate (TSE)	**5 040**	**25 359**	**9 765**	**49 044**	**17 269**
Transfers from consumers	-10 632	-72 724	-57 909	-77 187	-83 076
Transfers from taxpayers	15 896	98 118	67 751	126 247	100 355
Budget revenues	-224	-35	-76	-17	-11
Percentage TSE (% of GDP)	**1.02**	**0.88**	**0.34**	**1.85**	**0.54**
Total Budgetary Support Estimate (TBSE)	**16 283**	**108 112**	**74 105**	**138 039**	**112 191**
Percentage TBSE (% of GDP)	**3.33**	**3.74**	**2.58**	**5.22**	**3.50**
GDP deflator (2000-02=100)	**100**	**292**	**274**	**286**	**315**
Exchange rate (national currency per USD)	**47.26**	**73.23**	**70.90**	**74.67**	**74.12**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for India are: wheat, maize, rice, soybean, rapeseed, groundnuts, chick pea, other pulses, potatoes, onion, tomatoes, mango, bananas, sugar, cotton, milk, bovine meat, sheep meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Food security has been an important objective of agricultural and trade policy since India's independence in 1947. Food shortages in the early 1960s made crop productivity and farm output a key policy ambition. Although scope to further expand the area under cultivation was limited, the advent of the "green revolution" in the mid-1960s raised crop productivity through improved technologies and seed varieties. This was accompanied by expanded extension services and increased use of fertilisers, pesticides and irrigation.

The government of India introduced several marketing regulations affecting the sale, stocking and trading of agricultural commodities. The Essential Commodities Act (ECA) introduced in 1955 provided for the control of production, supply, distribution, and pricing of essential commodities. During the 1960s and 1970s, most states also enacted and enforced Agricultural Produce Markets Regulation (APMR) Acts, with the first point of sale of agriculture products occurring at regulated market yards (*mandis*) under the ambit of Agricultural Produce Market Committees (APMC). Two institutions key to prices and distribution of wheat and rice were set up in 1965, namely the Food Corporation of India (FCI) and the Agricultural Prices Commission, later renamed the Commission for Agricultural Costs and Prices (CACP). The complex domestic marketing regulations and border measures increasingly penalised producers through gaps between international prices and those received by Indian farmers.

In the 1970s, government programmes encouraged increased production and processing of milk at three different levels: (1) at the farm-level, dairy farmers were organised into co-operatives and provided with advanced technologies, such as animal breeds that produced more milk; (2) at the district level, co-operative unions formed, which owned and operated milk processing plants as well as storage and transport equipment, and also provided animal health services; (3) at the state level, state federations conducted and co-ordinated the nation-wide marketing of milk. Government funding for agricultural research and extension increased, and many State Agricultural Universities (SAU) were set up. Institutional lending to farmers expanded by directing commercial banks (nationalised from 1969) to provide credit to agriculture. New financial institutions were established, such as the National Bank for Agriculture and Rural Development (NABARD) in 1982 and regional rural banks. Import competition was highly restricted in order to allow domestic agricultural production to increase.

In the 1980s and 1990s, yield-enhancing "green revolution" techniques expanded to additional regions and crops such as pulses, oilseeds and coarse grains. Policy reforms were carried out in the rest of the economy, such as relaxing requirements for firms to secure operating licenses and deregulating in the manufacturing sector, but they largely bypassed agriculture, partly because of the prevalence of state regulations in agriculture. From 1980 to 1999, budgetary support to agriculture increased more than tenfold.

The National Agricultural Policy (NAP), formulated in 2000, set a priority on cropping intensity on existing agricultural land, developing rural infrastructure that supports all rural activities, and developing and disseminating agricultural technologies. The National Policy for Farmers (NPF), approved in 2007, identified a need to focus more on the economic well-being of farmers rather than just on production.

The Eleventh Five-Year Plan 2007-12 focused on bringing technology to farmers, improving the efficiency of investments, and improving access for the poor to land, credit and skills as well as addressing water management concerns. The Twelfth Five-Year Plan 2012-17 was articulated around expenditure on agriculture and on infrastructure along with an aim to improve the functioning of markets, more efficient use of natural resources, and governance in terms of institutions delivering services such as credit and animal health.

The 2012-17 plan took forward the Targeted Public Distribution System (TPDS) reforms, initiated in 1997, in order to reduce TPDS leakage (i.e. the grain released from government stocks for distribution under the

previous Public Distribution System, PDS,[1] which did not reach intended beneficiaries). Some food subsidies were redirected to other welfare schemes to better target the poor, policies specific to individual states or areas were introduced, and the definition of "poor" for the purpose of the TPDS was redefined. The 2013 National Food Security Act (NFSA) further addresses these concerns.

In 2016, the central government set the target of doubling farmers' income by 2022-23. As of 2018, five-year plans were replaced by a framework of three-year action agendas, prepared by the National Institution for Transforming India (NITI Aayog, the erstwhile Planning Commission of India), a policy think-tank of the government of India. The Agriculture Export Policy framework was established at the end of 2018, aiming to double agricultural exports by 2022-23 and boost the value-added of agricultural exports. To address farm indebtedness, several states implemented support packages for farm loan waivers between 2017 and 2020.

Concerns around highly fragmented markets, inadequate physical marketing infrastructure, large numbers of intermediaries in supply chains and insufficient remuneration to farmers led the central government to suggest gradual amendments to marketing regulations under the Agricultural Produce Market Committees (APMC) Acts in 2003, 2007 and 2017. While shared with state governments as a recommendation for adoption, implementation of agricultural marketing reforms remained highly differentiated across India's states. In June 2020, the government initiated reforms to domestic agricultural marketing regulations as part of the COVID-19 support package.

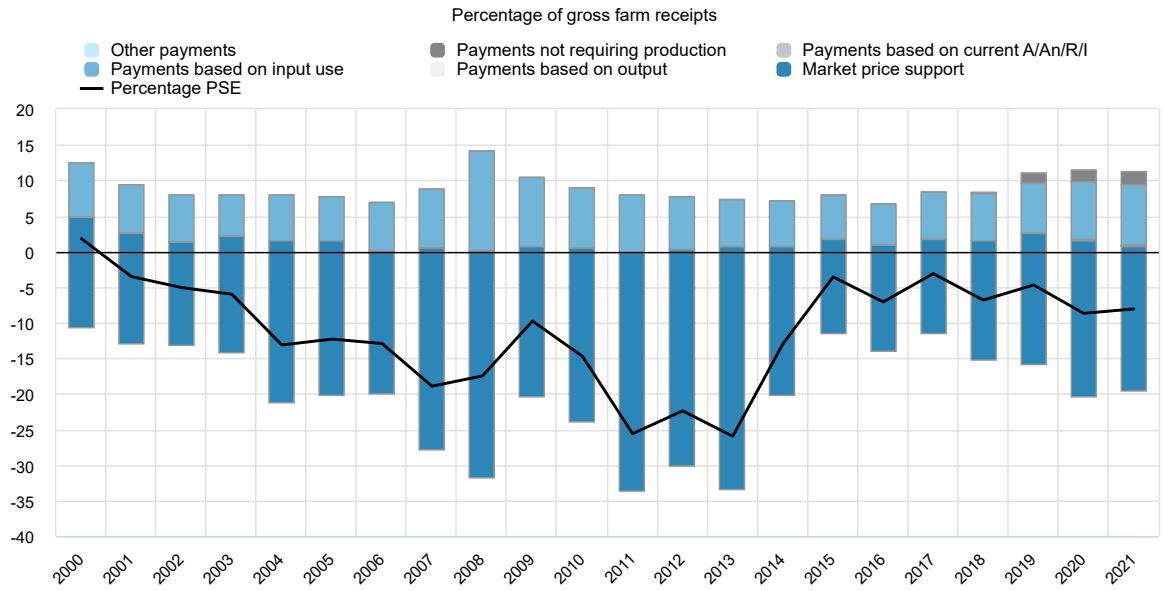
Table 14.2. India: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
1950-1965	Expansion of agricultural area was the main source of output growth	Agrarian reforms (abolition of intermediary landlordship, imposition of land ceiling) Strengthening of co-operative credit institutions Essential Commodities Act 1955
1965-1980	Increase in productivity main was the source of growth "green revolution"	Promoting the adoption of technological breakthroughs in rice and wheat production Policy support for marketing, research and credit Introduction and formalisation of lending to priority sectors, including agriculture New institutions, e.g. State Agricultural Universities, Food Corporation of India, Agricultural Prices Commission Programmes to increase production and processing of milk (support to breeds producing more milk, producer organisations, and processing and transport equipment) Minimum support prices
1980s	Widespread use of technology in major crop areas	Some delicensing and deregulation Increase in subsidies to agriculture
1990s	Economic and trade liberalisation in agriculture lags behind general economic reforms	Cautious relaxation of trade protection in some products, e.g. sugar, cotton, edible oils, wheat, rice Increases in input subsidies Targeting of beneficiaries of public distribution system of food grains
2000s	Demand-driven shift towards producing more fruit, vegetables and livestock products Increasing price gaps between international and domestic prices for producers	Alternate tightening and loosening of market and trade regulations (including export restrictions) Agricultural marketing regulations influencing pricing, procuring, stocking, and trading of commodities Large increases in input subsidies, including credit Support to high productivity seeds particularly cotton
Since 2010	Major participant in world markets for some commodities Continued price gaps between international and domestic prices taxing producers Increasing direct payments to producers Increasing support to consumers	More structured interaction between central and state level authorities Expansion of food subsidies and 2013 National Food Security Act Pilots to replace physical distribution of grains with cash transfers in selected states and Union Territories Agriculture Export Policy framework aimed at ensuring processed and organic products are not subject to export restrictions Doubling Farmers' Income by 2022-23 action plan State-level support packages for farm loan waivers

Period	Broader framework	Changes in agricultural policies
		Direct income transfer programme PM-KISAN Changes to domestic agricultural marketing regulations initiated in 2020 as part of the COVID-19 economic support package; withdrawal of reforms at the end 2021

Over the past two decades, producer support was composed of negative market price support (MPS), and budgetary allocations, including almost exclusively input subsidies. India's percentage PSE fluctuated markedly, registering a high of zero in 2000, a low of -31% in 2007, followed by large swings before stabilising in recent years (Figure 14.4). These variations were driven primarily by changes in the relative levels of domestic and international prices underlying MPS, while input subsidies followed a more steadily increasing trend. The particularly large absolute size of negative MPS in 2011-13 (and to some extent in 2007 and 2008) coincides with periods of high international commodity prices not or only partially transmitted to the domestic market, due at least in part to India's use of export-impeding measures (for example, export restrictions or export bans applied in several of those years to wheat, non-basmati rice, certain chickpeas, sugar and milk). The negative value of the PSE reflects that, on average, domestic producers were implicitly taxed, as the increasing budgetary payments to farmers did not offset the price-depressing effect of complex domestic regulations and trade policy measures. Payments not requiring production have been increasing since 2018, driven by higher budgetary allocations to the direct income transfer programme *Pradhan Mantri Kisan Samman Nidhi* (PM-KISAN). Against a backdrop of increasing reference prices for the exported commodities covered in 2020-21, MPS has been higher than during 2015-19.

Figure 14.4. India: Level and PSE composition by support categories, 2000 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

There are six major policy channels directly relating to agriculture and food in India: (1) managed prices and marketing channels for many farm products; (2) subsidised farm inputs; (3) general services for the

agricultural sector as a whole; (4) making certain food staples available to selected groups of the population at government-subsidised prices; (5) regulated border transactions through trade policy; and more recently, (6) the income support scheme PM-KISAN (OECD/ICRIER, 2018[1]; ICRIER, 2022[2]; Gulati, Kapur and Bouton, 2020[3]).

States have constitutional responsibility for many aspects of agriculture, but the central government plays an important role developing national approaches to policy and providing the necessary funds to implement programmes at state level. The central government (Union Cabinet) is responsible for some key policy areas, notably international trade policies, and for implementation of the National Food Security Act (NFSA) of 2013.

Policies that have been governing the marketing of agricultural commodities in India – from the producer level to downstream levels in the food chain – include the national Essential Commodities Act (ECA) and the state-level APMC Acts. Through these acts, producer prices are affected by regulations influencing pricing, procuring, stocking, and trading of commodities. Farmers bring their produce to sell in regulated wholesale markets (or *mandis*). This infrastructure is also used for government procurement under the minimum support price system. Differences exist among states in the status of their respective APMC Acts and in how these acts are implemented.[2] The electronic portal (electronic National Agricultural Market, e-NAM) set up in 2016 and the 2017 model Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act were shared with state governments as a recommendation for adoption.[3] E-NAM currently integrates 1 000 APMC markets in 18 states and 3 Union Territories (UTs); almost 17 million farmers and 150 000 traders are registered on the e-NAM platform (Government of India, 2021[4]).

Based on the recommendations of the CACP, the central government establishes a set of minimum support prices (MSP) for 23 commodities each year. The CACP bases its recommendations on the average cost of production at two levels: actual paid out cost of production; and the imputed value of family labour. State governments may also provide a bonus payable over and above the MSP for some crops. National and state-level agencies operating on behalf of the Food Corporation of India (FCI) can buy wheat, rice and coarse grains as well. A number of other agencies can buy pulses, oilseeds and cotton at MSP – including through the *Pradhan Mantri Annadata Aay Sanrakshan Yojna* (PM-AASHA) programme introduced in 2018 – and some horticulture commodities without MSP are also procured. However, procurement under the price support scheme effectively operates mainly for wheat, rice and cotton, and only in a few states.

The only payments based on output support clearing of arrears for sugar cane deliveries and are directly paid to sugar cane farmers. These were introduced in 2018.

Input support policies enable agricultural producers to obtain farm inputs at subsidised prices. Policies governing the supply of fertilisers, electricity and water are the largest of these. Other supported inputs are seeds, machinery, credit, and crop insurance. In recent years, increased use has been made of state-level loan debt waivers, with local governments compensating lending institutions for forgiving debt to farmers. More than 70% of agricultural loans are from financial institutions such as commercial banks, with the rest stemming from non-institutional sources (e.g. moneylenders) (Reserve Bank of India, 2019[5]).

The PM-KISAN scheme provides an annual direct income transfer of INR 6 000 (USD 84) per farmer to all farmers with land titles. The payment does not require farmers to produce and may be used for any need.

General services policies focus on programmes for the development and maintenance of infrastructure, particularly related to irrigation. Budgetary support is also significant for public stockholding and for agricultural knowledge and innovation.

Public distribution of food grains is done under the joint responsibility of the central and state governments. The TPDS operates under the NFSA in all states and UTs. Other Welfare Schemes (OWS) also operate under the NFSA. The central government allocates food grains to state governments and the FCI transports food grains from surplus states to deficit states. State governments distribute the food grain

entitlements by allocating supplies within the state, identifying eligible families, issuing ration cards, and distributing food grains mainly through Fair Price Shops.

India's Foreign Trade Policy is formulated and implemented by the Directorate General of Foreign Trade (DGFT) and announced every five years. It is reviewed and adjusted annually in consultation with relevant public agencies. The Basic Customs Duty (BCD), also known as the statutory rate, is agreed at the same time as the approval of the annual budget.

Agricultural exports have been managed for several decades through a combination of export restrictions, including export prohibitions, licensing requirements, quotas, taxes, minimum export prices,[4] and state trading requirements. The application or elimination of such restrictions may change several times per year, according to domestic supplies and prices. The 2018 Agriculture Export Policy framework includes three main areas for action. First, ensuring that processed agricultural products and organic products are not subject to export restrictions. Second, undertaking consultations among stakeholders and Ministries to identify those essential food security commodities to which export restrictions may be applied under specific market conditions. Third, reducing import barriers applied to agricultural products for processing and re-exporting.

The Agricultural and Processed Food Products Export Development Authority (APEDA) is under the responsibility of the Ministry of Commerce and Industry (MoCI). It provides financial assistance to exporters in the form of transport support.[5]

Environmental sustainability measures have been gaining prominence, particularly through programmes entitled "missions". The *National Mission for Sustainable Agriculture (NMSA)* became operational in 2014-15, promoting soil and moisture conservation measures; comprehensive soil health management; efficient water management practices, and mainstreaming rain-fed technologies. "Farm Water Management" was implemented as one of the components of NMSA with the objective of enhancing water use efficiency by promoting technological interventions such as drip and sprinkler technologies, efficient water application and distribution systems, and secondary storage. Thereafter, these activities have been subsumed under the "Per Drop More Crop (PDMC)" component of *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY) in 2015-16. Also under the NMSA, "Rainfed Area Development" focuses on Integrated Farming Systems for enhancing productivity and minimising risks associated with climatic variability. Under this system, crops/cropping systems are integrated with activities such as horticulture, livestock, fishery, agro-forestry and apiculture not only to support farmers by providing additional income opportunities, but also to mitigate the impacts of drought, flood, or other extreme weather events.

"Soil Health Management" is another component under the NMSA. This aims at promoting integrated nutrient management through a targeted use of chemical fertilisers including secondary and micro-nutrients in conjunction with organic manures and bio-fertilisers for improving soil health and its productivity, strengthening of soil and fertiliser testing facilities to improve soil test based recommendations to farmers for improving soil fertility. The Soil Health Card, under implementation since 2015, provides information to farmers on the nutrients status of their soil and recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.

In addition, India is implementing specific schemes that promote organic farming (*Paramparagat Krishi Vikas Yojana* Mission) as well as efficient irrigation systems and watershed management (*Pradhan Mantri Krishi Sinchayee Yojana* Mission). Missions such as the National Mission on Agricultural Extension and Technology are aimed at improving soil health and climate resilient agro-ecological systems through technical assistance.

Climate change mitigation policies in agriculture

Agriculture's 14.4% share of GHG emissions is higher than the OECD average (9.7%), partly due to the prominence of the agricultural sector in the Indian economy. Methane emissions due to enteric

fermentation by livestock (54.6%), anaerobic conditions during rice cultivation (17.5%) and nitrous oxide emissions from application of nitrogenous fertilisers in agricultural soils (19%) account for 91% of GHG emissions from agriculture (Sharma, Thangaraj and Gulati, 2021[6]). Emissions from the burning of crop residues are particularly significant in northern India, although only 2.1% of total agricultural emissions.

India ratified the Paris Agreement on Climate Change on 2 October 2016. India's NDC commits to reducing the emissions intensity of GDP 33-35% below 2005 levels by 2030, noting that this commitment does not bind India to sector-specific mitigation obligations (Climate Action Tracker, 2018[7]). India has committed in its NDC to three actions to realise the emission intensity targets: (1) increase the percentage of non-fossil-fuels to about 40% in the overall energy mix; (2) improve energy efficiency in production and utilisation across all sectors; (3) create an additional carbon sink of 2.5-3 billion tCO_2eq through forest and tree cover (Sharma, Thangaraj and Gulati, 2021[6]). In December 2020, the Ministry of Environment, Forest and Climate Change (MoEFCC) constituted a high-level inter-ministerial Apex Committee for Implementation of Paris Agreement (AIPA).

India has not yet submitted an official update of its 2016 NDC to the United Nations Framework Convention on Climate Change (UNFCCC), but announced updates to its targets at the COP26 World Leaders Summit in November 2021: (1) to reduce the carbon intensity of the economy to 45% below 2005 levels by 2030; (2) to increase non-fossil capacity in power generation to 500 GW; (3) to achieve 50% of energy requirement from renewable sources by 2030; (4) to reduce emissions 1 billion tonnes by 2030; (5) to achieve the net-zero target by 2070 (Ministry of External Affairs, 2021[8]).

India's strategies for GHG mitigation in the agricultural sector promote energy conservation, alternative fuels from renewable technologies, water conservation, afforestation, and land and waste management. In addition to the NDC, policy areas for action in climate change mitigation and adaptation are promoted through implementation of the 2008 National Action Plan on Climate Change (NAPCC). The NAPCC incorporates eight priority National Missions, including the National Water Mission and the National Mission for Sustainable Agriculture.

Efforts to reduce GHG emissions from agriculture include programmes in horticulture land extension, crop diversification, increased rice intensification systems, direct-seed rice cultivation, solar pumps, avoiding crop residue burning, micro-irrigation, bio-fertilisers, balanced feedstock and bypass protein for livestock (Ministry of Environment, Forest and Climate Change, 2021[9]). As part of the National Food Security Mission (NFSM), systems of rice intensification are being implemented in 193 districts of 24 states. Farm equipment that enables timely sowing in the standing paddy residues is made available to farmers directly, and through Custom Hiring Centres (CHCs) and Farm Machinery Banks (FMBs) to enable sowing of the wheat crop without burning of paddy residues. The Neem Coated Urea (NCU) scheme regulates urea use, enhances nitrogen availability to crops, and reduces fertiliser application costs.[6] The Union Budget 2022-23, released in February 2022, promotes chemical-free natural farming throughout the country, with a focus in a first stage on farmers' land in 5 km wide corridors along the river Ganga.

The PM-KUSUM (*Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan*) scheme aims for 30.8 GW solar capacity through installation of small solar power plants of up to 2 MW capacity on barren/fallow/pasture/marshy land of farmers; replacement of 2 million diesel pumps by standalone solar pumps; and solarisation of 1.5 million grid connected agriculture pumps by 2022. The central government is increasing budgetary allocations for R&D in technologies aimed at converting agricultural stubble into biogas or other energy products.

MoEFCC is conducting programmes in afforestation, such as the National Afforestation Programme initiated in 2000. This targets community-based activities such as agri-forestry, improved soil conversation and ecological restoration of degraded forests.

Domestic policy developments in 2021-22

On 29 November 2021, the Parliament approved a bill withdrawing the three laws aimed at reforming existing agricultural marketing regulations (ECA and APMC Acts), initially endorsed in September 2020. Back in June 2020, the central government had initiated reforms to domestic agricultural marketing regulations as part of the COVID-19 support package, under the strategy "One India, one agriculture market". The proposed reforms included a set of ordinances aiming to: deregulate major food crops from the 1955 ECA; allow farmers to sell their agricultural products outside of government-regulated markets; and allow barrier-free inter- and intra-state trade of agricultural commodities. The central government had also proposed providing a legal framework for farmers to facilitate contract farming schemes with processors and other market actors in supply chains in order to reduce price risk.

Following continued farmers' protests in December 2021, the government also agreed to set up a Committee to review the legal framework for the MSP system. The Committee is yet to be formed but would include a representative of the *Samyukta Kissan Morcha* (SKM), the farmer group spearheading the protests.

In June 2021, the government of India raised the MSPs for summer planted (*kharif)* crops. This includes an increase of 2% for soybeans and sunflower MSPs, 3.9% for rice, and 1.1% for maize (Government of India, 2021[10]). The central government also raised the MSPs for winter planted (*rabi*) crops in September 2021. This includes an increase of 7.8% for lentils MSP, 2.5% for chickpeas, 2% for wheat, 2.2% for barley, and 8.6% for rapeseed (Government of India, 2021[11]). With the objective to encourage crop diversification, the MSPs paid for oilseeds and pulses remain more favourable than those for cereals.

In August 2021, the Cabinet Committee on Economic Affairs (CCEA) approved an increase of 1.8% to INR 2 900 (USD 39) per tonne in the Fair and Remunerative Price (FRP) for sugarcane for marketing year 2021/22. There was also an approved premium of INR 29 (USD 0.4) per tonne for higher yield per tonne of sugar cane (i.e. defined by the CCEA as the amount of sugar produced by crushing a given amount of sugarcane by weight) (CCEA, 2021[12]).

In May 2021, the Ministry of Agriculture & Farmers' Welfare (MAFW) introduced a multi-year *Kharif Strategy* for achieving self-sufficiency in oilseeds production. The *Oilseed and Oil Palm* scheme under the larger *National Food Security Mission* allocates INR 110 billion (USD 1.5 billion) to support oilseeds production. The objective of the programme is to increase oilseeds cropland by an additional 630 000 hectares (Ministry of Agriculture & Farmers' Welfare, 2021[13]). The scheme includes the following areas for action:

- Soybean seed distribution for inter-cropping purposes, provided to 41 districts in the states of Madhya Pradesh, Maharashtra, Rajasthan, Gujarat, Karnataka, Telangana, and Chhattisgarh [INR 760 million (USD 10 million)];
- Soybean seed distribution for high-potential regions, provided to 73 districts in Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Karnataka, Uttar Pradesh, Chhattisgarh, and Gujarat [INR 1 billion (USD 13.9 million)];
- Distribution of 74 000 groundnut seed mini-kits to farmers in the states of Gujarat, Andhra Pradesh, Rajasthan, Karnataka, Maharashtra, Madhya Pradesh, and Tamil Nadu [INR 130 million (USD 1.8 million];
- Distribution of 816 435 seed mini-kits in 90 districts located in the states of Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Telangana, Chhattisgarh, Gujarat, Uttar Pradesh, and Bihar [INR 400 million (USD 5.3 million)].

In October 2021, India imposed limits on private storage of edible oils and oilseeds until 31 March 2022 (and extended until 30 June 2022 in February 2022), with the objective to contain rising domestic prices. The stock limits are set at state-level based on local market conditions (AMIS, 2021[14]). At the end of

December 2021, the central government imposed private stockholding limits on soymeal (used as a raw material for poultry feed) until June 2022, also to contain rising domestic feed prices. Soymeal processors would be allowed to hold a maximum stock of 90 days production and required to declare the storage location. Government-registered traders can hold a maximum stock of 160 tonnes. The government also included soymeal to the list of essential commodities (under the remit of the Essential Commodities Act) until June 2022.

In October 2021, the central government allocated an additional INR 286 billion (USD 3.8 billion) for fertiliser subsidies in order to offset the increase in international prices for fertilisers. The subsidy for di-ammonium phosphate was raised by INR 438 per bag and by INR 100 per bag for nitrogen, phosphorus and potassium fertilisers.

In November 2021, the Ministry of Consumer Affairs released more than 50% of the existing buffer stock of 0.21 million tonnes of onions. This came in response to wholesale price increases for onions in October 2021.

In June 2021, the government of India allocated 78 000 tonnes of rice from the stocks maintained by the FCI to ethanol production at a subsidised price of INR 20 per kg (USD 273 per tonne). This was in response to the objective of increasing the blending rate to 20% by 2025 (AMIS, 2021[15]).

In January 2022, the central government announced that that it would provide up to 11 million tonnes of rice from the Food Corporation of India (FCI) stocks at subsidised rates to ethanol producers.

The Union Budget 2021-22 includes new general services programmes targeting pest and disease inspection and control as well as storage, marketing and other physical infrastructure.

The Union Budget 2022-23, released in February 2022, includes new measures for improving financial services to farmers. For instance, a new fund will be set up for 2022-23 through the National Bank for Agriculture and Rural Development (NABARD) to finance start-ups in agriculture and other rural enterprises. New programmes will also focus on digitalisation in agriculture, marketing, and extension services. The Union Budget 2022-23 also foresees providing direct payments to wheat and rice farmers of INR 2.4 trillion (USD 31.2 billion) of MSP value from April 2022 to March 2023.

Domestic policy responses to the COVID-19 pandemic

In May 2021, the government of India extended the deadline for wheat procurement until 15 June 2021. With this extension, farmers having experienced challenges relating to COVID-19 restrictions could still benefit from selling their products under the MSP system (AMIS, 2021[16]).

In June 2021, the central government extended until November 2021 the *Pradhan Mantri Garib Kalyan Anna Yojana* (PMGKAY) food distribution programme in response to the second wave of the COVID-19 pandemic. The programme adds 5 kg of rice or wheat to the regular grains distribution for 800 million beneficiaries. The extension of the programme adds INR 700 billion (USD 9.6 billion) to the programme cost.

Trade policy developments in 2021-22

In May 2021, and for the period until November 2021, the Ministry of Commerce and Industry (MoCI) removed selected pulses (pigeon peas/*tur*, mung beans, and black gram lentils/*urad*) from the list of pulses to which import quotas apply (Ministry of Industry and Commerce, 2021[17]).

In July 2021, the Ministry of Finance (MoF) temporarily eliminated the 20% tariff applied to lentils (with the exception of lentils imported from the United States, for which the tariff was reduced from 30% to 10%[7]). In September 2021, the Ministry of Finance announced the tariff on lentils imported from the United States would be increased from 10% to 20% (Ministry of Finance, 2021[18]). In addition, the Agriculture

Infrastructure Development Cess (ADIC),[8] levied on imported lentils, was also lowered from 20% to 10% (Ministry of Finance, 2021[19]).

In September 2021, the tariff on crude soy oil, sunflower oil and crude palm oil was reduced to 2.5% (from 7.5%, 7.5% and 10%, respectively). In October 2021, the application of the 2.5% import tariff on crude palm oil, crude soybean oil, and crude sunflower oil was suspended until 31 March 2022. The ADIC was reduced from 20% to 7.5% for crude palm oil and from 20% to 5% for crude soybean and sunflower oil (Ministry of Consumer Affairs, Food and Public Distribution, 2021[20]).

In September 2021, the MoCI authorised the inclusion of three additional ports (Mumbai, Tuticorin, and Vishakhapatnam) to the list able to receive bulk shipments of soybean meal. This measure aims to facilitate the import of soybean meal for India's livestock production (Ministry of Commerce and Industry, 2021[21]).

In August 2021, the MoCI announced that imports of 1.2 million tonnes of genetically modified crushed and de-oiled soy cake (non-living modified organism, NLMO) would be allowed until 31 October 2021. This was intended to help the poultry industry deal with higher prices due to shortages of soymeal. It was approved after the MoEFCC assessed that crushed de-oiled cake belongs to the NLMO category (as opposed to GM soybean seed) (AMIS, 2021[22]). In September 2021, the MoCI authorised the import of consignments of soybean meal and soy cake derived from genetically engineered soybeans until January 2022.

On 6 December 2021, an import quota of 15 000 tonnes of watermelon seeds (HS 1207.70) was introduced. The quota applies between 1 January 2022 and 31 March 2022. Imports are allowed only by the final users of the imported product. India had also introduced in April 2021 a licensing requirement on melon seeds imports (Ministry of Commerce and Industry, 2021[23]).

In May 2021, the Ministry of Consumer Affairs reduced the sugar export subsidy by 33% to INR 4 000 (USD 54.6) per tonne. The notified rate affects contracts signed between sugar mills and exporting parties on or after 20 May 2021. The revised support comprises two forms of freight subsidy: (i) USD 32.8 per tonne toward internal transport and freight, including loading and unloading charges, and (ii) approximately USD 21.8 to cover ocean freight costs for shipments from Indian ports to export destinations. The gradual reduction in export subsidies also aims to accelerate diversion of sugar toward ethanol production in support of increasing the blending rate to 20% by 2025 (FAS USDA, 2021[24]).

Following the India – United States Trade Policy Forum in November 2021, India and the United States signed in January 2022 a framework agreement allowing for market access of exports from the United States of alfalfa hay and cherries and of exports from India of mango and pomegranate. Also in January 2022, India allowed for the first time imports of pig meat and pig meat products from the United States. On 2 April 2022, India and Australia signed an interim Economic Cooperation and Trade Agreement. In the context of the trade agreement, India will reduce tariffs on Australian agricultural exports such as sheep meat, wool, or wine. For instance, tariffs on wine with a minimum import price of USD 5 per bottle will be reduced to 100% from 150% while tariffs on bottles of minimum USD 15 are reduced to 75%. The agreement excludes imports into India of milk and other dairy products, seed oil, walnuts, pistachio nuts, wheat, rice, millet, apples, sugar, oil cake, or chickpeas.

In January 2022, India notified the WTO Dispute Settlement Body of its decision to appeal the panel reports in the cases brought by Brazil, Australia and Guatemala in the dispute settlement "India – Measures Concerning Sugar and Sugarcane" (WTO DS579, DS580, and DS581) (Ministry of Commerce and Industry, 2021[25]). The panel reports, circulated to WTO members on 14 December 2021, found the claims brought in the disputes to be legitimate, in that: (i) India implemented central and state level market price support programmes (which includes the centrally availed Fair and Remunerative Price and State Advised Price) in values greater than the amounts permitted under its WTO commitments (domestic support claims); and (ii) India provided export subsidies through certain support schemes inconsistent with its WTO obligations (export subsidy claims).

Amidst the ongoing COVID-19 pandemic, the application of the current Foreign Trade Policy 2015-20 was extended three times since 2020. In September 2021, its application was extended until 31 March 2022.

Contextual information

India is the seventh largest country in the world by land area and the second most populous after the People's Republic of China with over 1.3 billion people (Table 14.3). While the share of urban population continued to increase over the past decade, about two-thirds of the population still lives in rural areas. At just 0.15 hectare per capita, agricultural land is very scarce.

Agriculture accounts for an estimated 42% of employment, but its 18% share of GDP indicates that labour productivity remains significantly lower than in the rest of the economy. The productivity gap is also reflected in the evolution of farm incomes, which have increased by less than one-third that of non-agricultural incomes. Agriculture's weight in the economy has gradually declined, mostly in favour of services which have led economic growth over the last two decades and played a more important role in India's economic development than in most other major emerging economies.

Indian agriculture is continuing to diversify towards livestock and away from grain crops. While grains and milk remain dominant, there has been a gradual change in the composition of production to other crops – such as sugar cane, cotton, fruit and vegetables – as well as certain meat sub-sectors. The livestock sector has seen faster and less volatile growth than the crop sector. The agricultural sector continues to be dominated by a large number of small-scale farmers, as the national average farm size has been in steady decline.

Real GDP growth has been fluctuating between 4% and 8% over the last two decades, highlighting remaining structural bottlenecks in areas such as labour markets or the business environment. The COVID-19 pandemic and related restrictions led to a 7% drop in GDP, but growth rebounded to a robust 10%, placing India again among the fastest growing G20 economies. Unemployment has increased since the COVID-19 pandemic, but the relatively low unemployment figure (averaging about 6% in 2018-20) hides significant informal employment. Following an increase in 2019 against a background of higher prices for selected food items, inflation has been decreasing but remains higher than pre-pandemic levels (Figure 14.5).

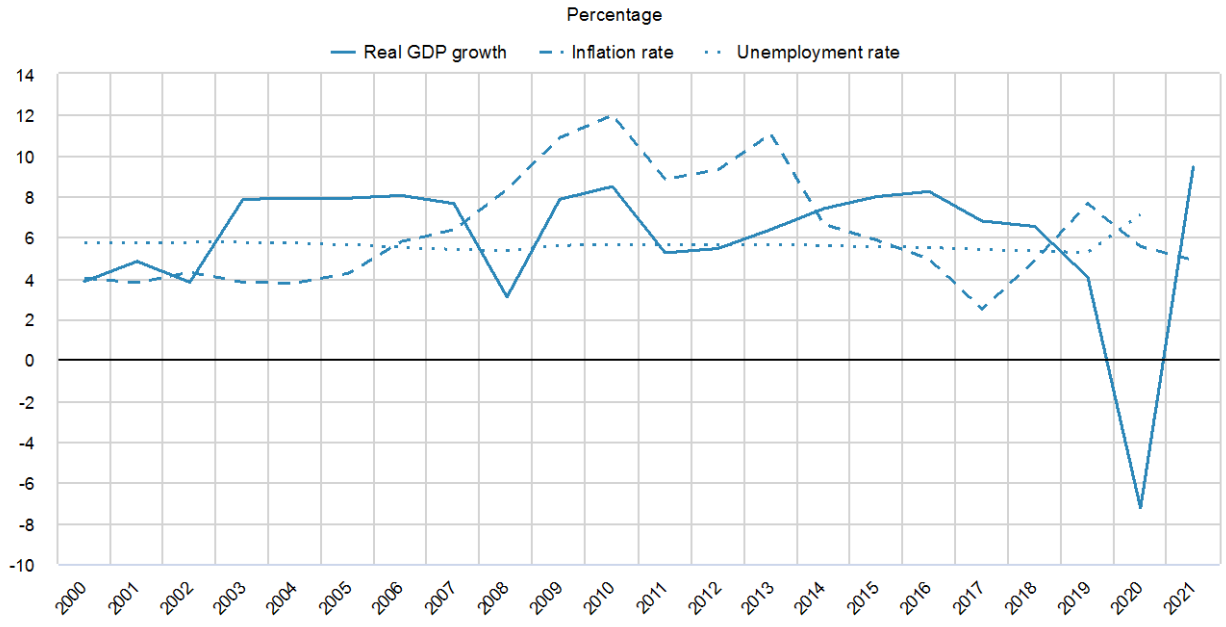
India is a consistent net agro-food exporter and the importance of agro-food products in total trade has been increasing over the past two decades, with a share of 12% in 2020. However, agro-food imports have until recently been growing faster than exports. Products for direct consumption – of low value, raw or semi-processed, and marketed in bulk – dominate agro-food exports, representing 65% of the total in 2019. Processed products for further processing by domestic industry are the main import category, accounting for 66% of total agro-food imports (Figure 14.6).

Table 14.3. India: Contextual indicators

	India		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	2 214	8 907	5.5%	8.1%
Population (million)	1 057	1 380	24.5%	26.4%
Land area (thousand km²)	2 973	2 973	3.6%	3.6%
Agricultural area (AA) (thousand ha)	180 975	179 578	6.0%	6.1%
			All countries[1]	
Population density (inhabitants/km²)	355	464	53	63
GDP per capita (USD in PPPs)	2 096	6 454	9 281	20 929
Trade as % of GDP	10	12	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	21.6	18.3	2.9	4.9
Agriculture share in employment (%)	59.6	41.5	-	-
Agro-food exports (% of total exports)	10.9	12.1	6.2	8.5
Agro-food imports (% of total imports)	5.6	6.0	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	73	63	-	-
Livestock in total agricultural production (%)	27	37	-	-
Share of arable land in AA (%)	89	87	32	34

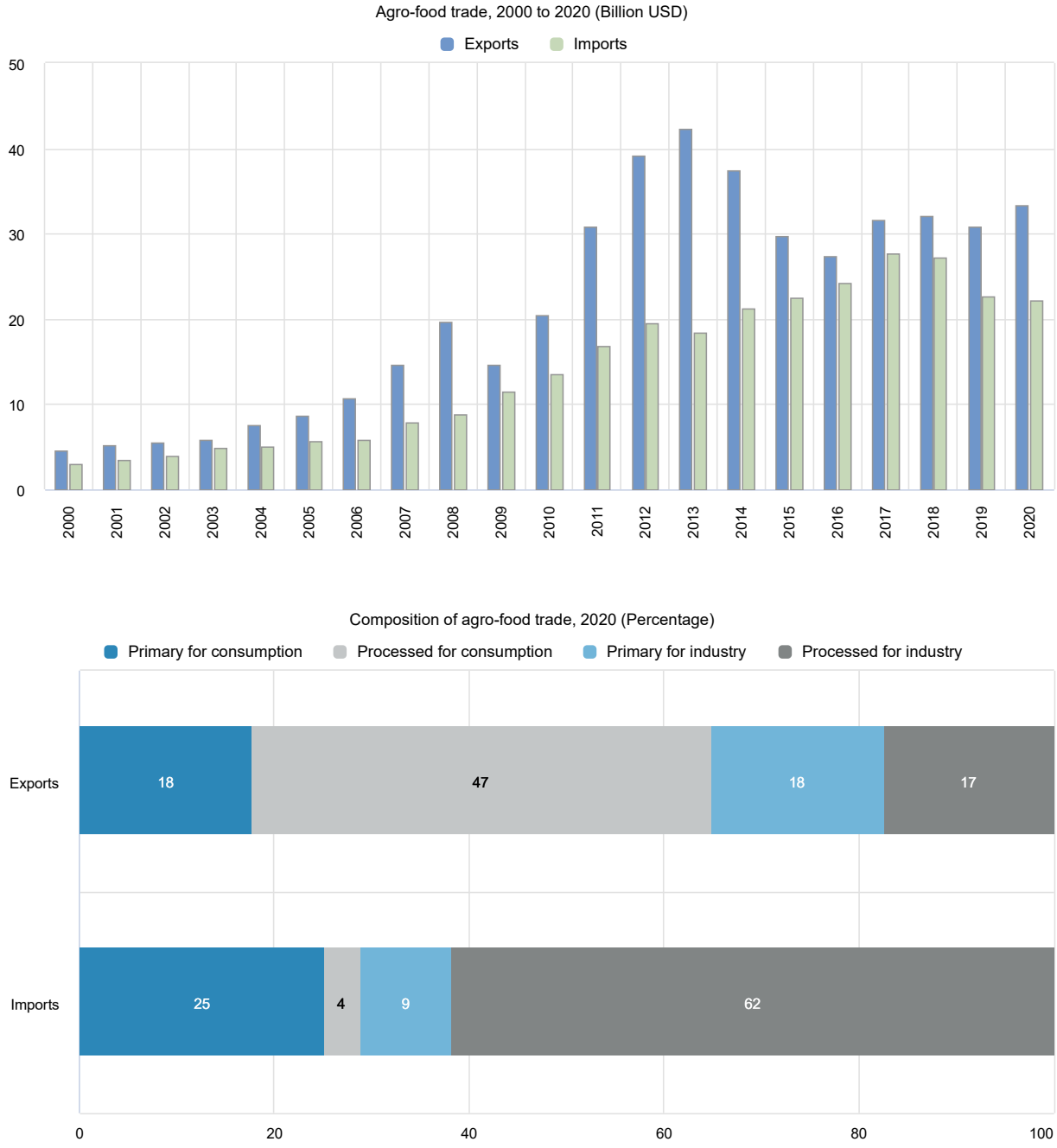
Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 14.5. India: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 14.6. India: Agro-food trade

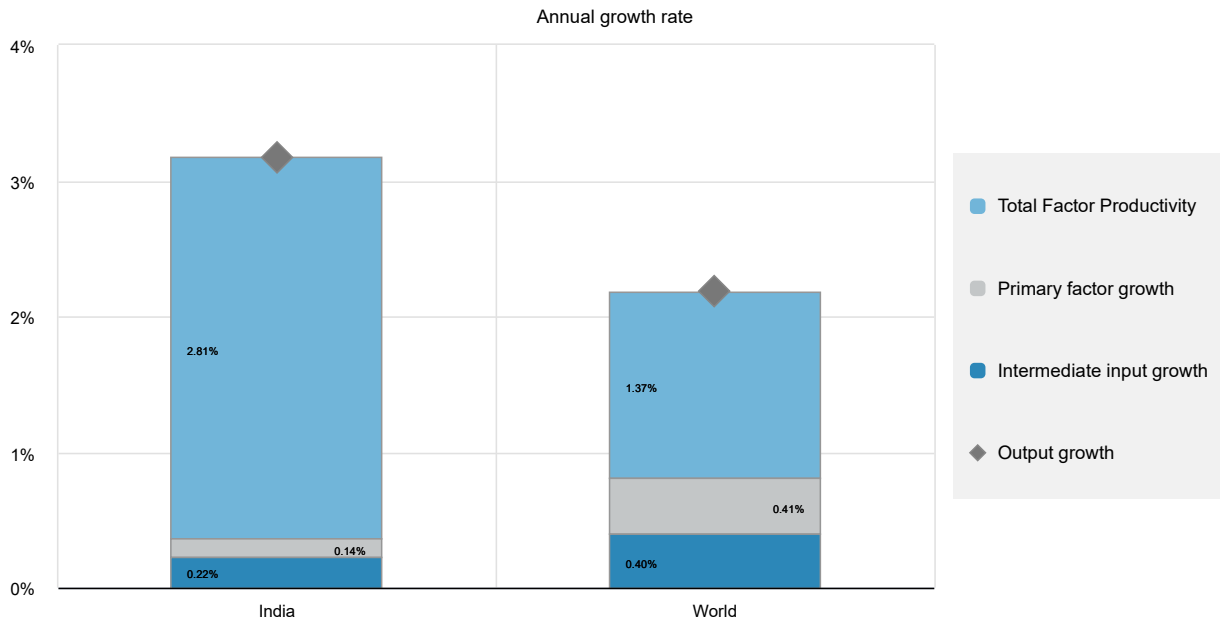


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Agricultural output growth in India averaged 3.2% in 2010-19, well above the world average (Figure 14.6). This has been driven mainly by a significant increase in total factor productivity (TFP) which grew at 2.8% per year, backed by technological progress in the form of improved seeds and better infrastructure (including irrigation coverage, road density, and electricity supply).

However, the sustained growth in agricultural output and fertiliser use have put mounting pressures on natural resources, particularly land and water. This is reflected in the nutrient surplus intensities at the national level, which have grown over time and are much higher than the average for OECD countries (Table 14.4). About 80% of total water abstractions are by the agricultural sector. The share of agriculture in total GHG emissions is also higher than the OECD average, partly due to the weight of the agricultural sector in the Indian economy. Livestock rearing is the main source of GHGs.

Figure 14.7. India: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 14.4. India: Productivity and environmental indicators

	India		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.8%	2.8%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	91.6	133.6	32.1	30.0
Phosphorus balance, kg/ha	20.8	27.6	3.4	2.9
Agriculture share of total energy use (%)	4.9	4.8	1.7	2.0
Agriculture share of GHG emissions (%)	23.3	14.4	8.6	9.7
Share of irrigated land in AA (%)	34.3	39.2	-	-
Share of agriculture in water abstractions (%)	..	80.0	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] The Targeted Public Distribution System (TPDS) plays the same role as the Public Distribution System (PDS) before the TPDS, but adds a special focus on the people below the poverty line. TPDS emphasises on the implementation and identification of the poor for proper arrangement and delivery of food grains.

[2] In the seven states or UTs that do not have an APMC act, procurement can take place outside *mandis*.

[3] Agriculture marketing also covers the futures market governed by the Securities and Exchange Board of India (SEBI), with the largest value of agricultural commodity trade taking place through the National Commodity Derivative Exchange (NCDEX). In addition, the Negotiable Warehouse Receipt System (NWRS) – established under the Warehousing Development and Regulatory Authority (WDRA) – aims to support farmers by storing products in warehouses. However, farmers, especially small and marginal, do not directly trade in agri-futures market in India.

[4] This represents the price below which exporters are not allowed to export a specific commodity. A minimum export price is set taking into consideration concerns about domestic prices and supply of that specific commodity.

[5] A Ministerial Decision on Export Competition at the WTO Ministerial Conference held in Nairobi in 2015 put an end to the subsidisation of agricultural exports, which for India would occur at the end of 2023 (https://www.wto.org/english/thewto_e/minist_e/mc10_e/l980_e.htm).

[6] NCU slows down the release of fertiliser and makes it available to the crop more effectively.

[7] In 2019, MoF announced tariff increases on various products imported from the United States, in retaliation to the duty increases introduced by the United States on steel and aluminium. The retaliatory tariffs cover several agricultural products, such as *kabuli chana* chickpeas, Bengal gram chickpeas, lentils, almonds and walnuts in shell, or apples. This explains the differentiated set of tariffs.

[8] The Agriculture Infrastructure and Development Cess (AIDC), introduced through the Union Budget of February 2021, applies a levy in addition to basic taxes on selected imported goods with the objective to finance agricultural infrastructure programmes.

15 Indonesia

Support to agriculture

In Indonesia, support as a share of gross farm receipts declined from 26.2% in 2015 to 18.0% in 2019-21. This reverses the trend of increases from 7.5% in 2000-02. The largest component is market price support to producers, in line with the government focus on food sovereignty and self-reliance, with programmes aimed at self-sufficiency for several staple products (rice, maize, soybeans, sugar and beef). The share of potentially most-distorting producer transfers was 96% in 2019-21, reflecting the importance of market price support in the Indonesian policy mix (including negative price support for palm oil), but also including payments based on unconstrained variable input use, particularly fertilisers.

Prices received by farmers were 20% higher on average than world prices, with large differences between commodities. Sugar, maize, poultry, eggs and rice had the highest shares of single-commodity transfers in gross farm receipts – all above 25%.

Indonesia's food assistance programme (BPNT) supports poor consumers through electronic vouchers. However this budget transfer is smaller than the support transferred from consumers to producers via price support measures. Therefore, consumers are penalised by agricultural policies with a negative Consumer Support Estimate of -19.9% of consumer expenditures measured at farm-gate level.

Expenditures on general services to the sector (GSSE) focus on irrigation infrastructure and public stockholding and are small compared to producer support at 7.6% of the Total Support Estimate. Expenditures for GSSE relative to agricultural value of production were 1.6%, well below the OECD average and lower than in many emerging economies in this report. Total support to agriculture (TSE) increased in the last two decades as a share of GDP from 1.5% to 2.2%, driven by additional support to individual producers.

Recent policy changes

Indonesia established a National Food Agency (NFA) called Badan Pangan Nasional (BAPANAS) under the authority of the President. This replaces the former Food Security Agency under the Ministry of Agriculture (MoA). The main roles of the NFA are: stabilising food prices of nine staple commodities at the producer and consumer levels; maintaining food availability across time and regions; implementing food import policies; achieving food and nutrition security for all; and ensuring food safety. NFA consolidates and co-ordinates competencies under the Ministry of Trade, the Ministry of Agriculture, the Ministry of State-Owned Enterprises (SOEs), the Logistics Bureau (BULOG) and the Food Safety Agency.

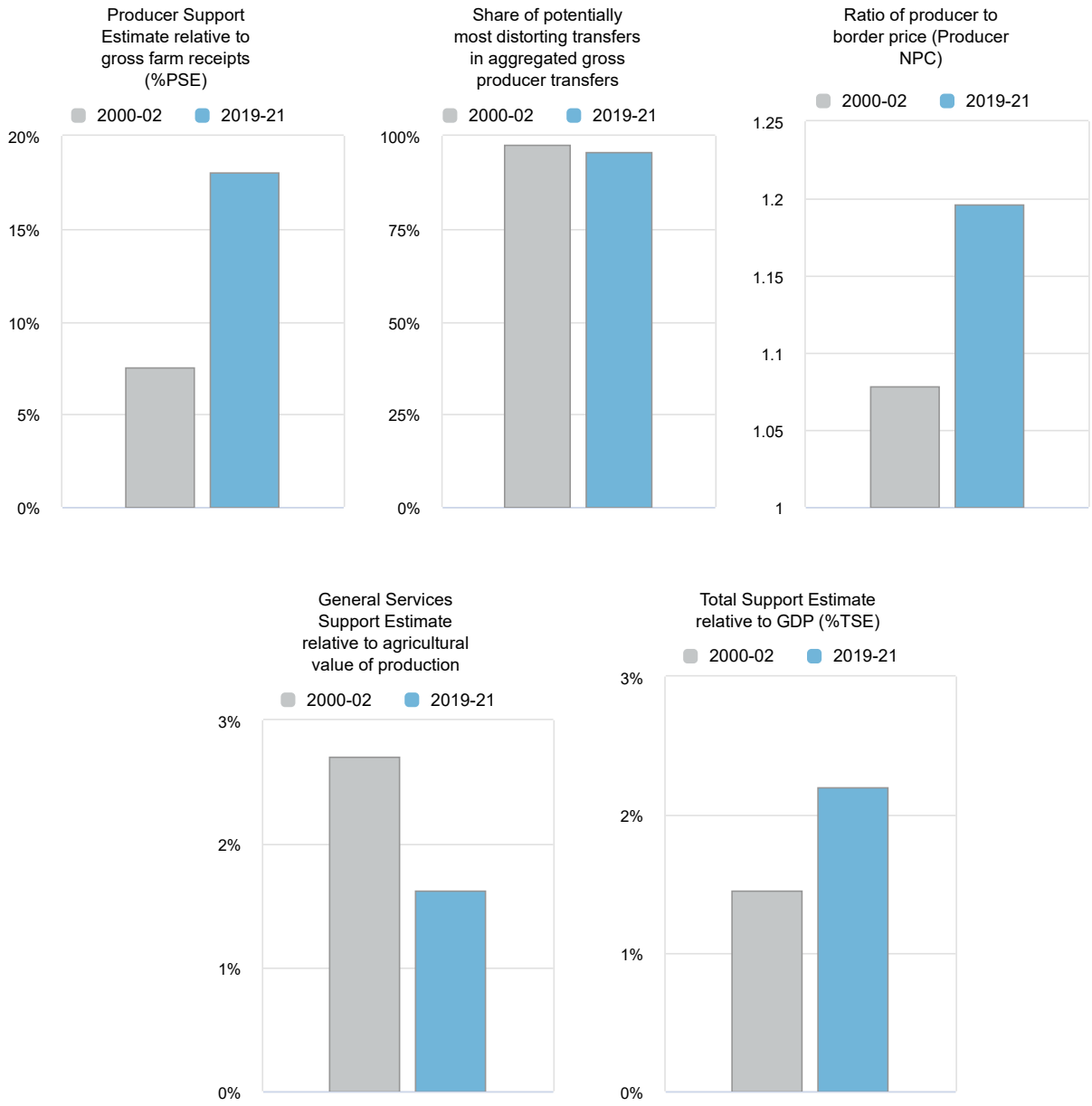
Indonesia established a single National Research and Innovation Agency called Badan Riset dan Inovasi Nasional (BRIN) to co-ordinate government R&D and innovation activities in an integrated manner. Consequently, R&D activities are no longer implemented by the MoA, and the Indonesian Agency of Agriculture Research and Development (IAARD) will lose more than 1 000 researchers or more than one-third of its staff, transferred to BRIN. The remaining staff are mostly non-researchers to work on technology dissemination, particularly for small scale farmers.

Under Indonesia's G20 Presidency in 2022, the MoA will lead the Agriculture Working Group (AWG), under the theme "Balancing Food Production and Trade to Fulfil Food for All" with three priorities: (1) building resilient and sustainable agriculture and food systems; (2) promoting open, fair, predictable and transparent agricultural trade to ensure food availability and affordability for all; and (3) innovative agri-entrepreneurship through digital agriculture to improve the livelihoods of farmers in rural areas.

Assessment and recommendations

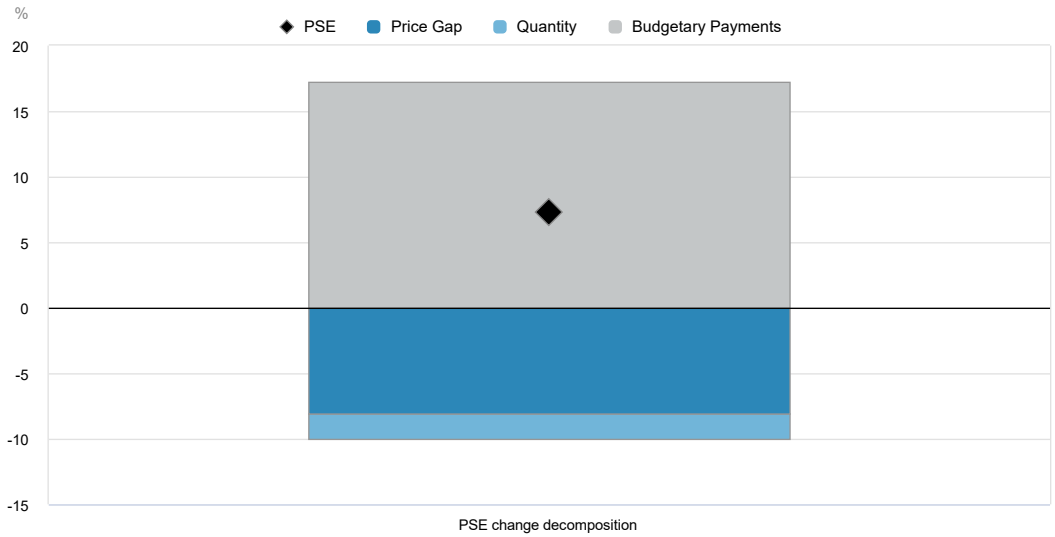
- Agriculture represents 13% of greenhouse gas (GHG) emissions in Indonesia, while the total for agriculture, forestry and other land use (AFOLU) is 56%. Mitigation efforts will need to consider the contribution of the AFOLU sector and require coherence across policy areas and land uses. Biofuel mandates and subsidies need to be evaluated from the perspective of their potential negative spill-over effects on land use.
- The recent carbon tax bill and carbon emission rights mechanisms for coal power plants could potentially be extended to other sectors, including agriculture, and warrants assessment.
- Indonesia could lower emissions from AFOLU via measures to increase climate-smart practices, such as those identified in the Long-Term Strategy for Low Carbon and Climate Resilience. Emissions could be reduced with improved management of agricultural land, avoiding burning and by active reforestation policies.
- To contribute to a more resilient agricultural sector, the new National Research and Innovation Agency should prioritise climate change adaptation strategies, including among smallholders. The knowledge and capacity-building of agencies such as the Indonesian Agency of Agriculture Research and Development should be strengthened.
- Indonesian agricultural policy focuses on self-sufficiency and trade measures as a tool to achieve food self-reliance. This creates large price gaps between domestic and international markets for imported products such as maize, poultry and rice. The impact is likely to work against objectives that underpin the Food Law of 2012. These include affordable prices for consumers, who are penalised by negative support, and diversification in production and diet, which is thwarted by the concentration of support in a few staple commodities.
- The BPNT electronic food voucher system in place since 2019 represented an important improvement in the effectiveness of the food assistance programme. Further steps could be undertaken to improve food security, particularly if combined with a reduction in market price support that harms net food consumers.
- Fertiliser subsidies are costly, and their efficiency is questionable. Use of fertilisers must adapt to local soil and production conditions to be effective and avoid negative environmental impacts. Converting subsidies into less-coupled payments per unit of land would make the support more efficient in transferring income to farmers. Additionally, investing in knowledge transfer to farmers would improve allocation of inputs to the needs of local production.
- Policies should stimulate investment in infrastructure and innovation. Savings from reduced input subsidies could be re-allocated to Indonesia's Agricultural Innovation System and would improve farmers' skills to manage production and natural resources on their farms, contributing to long-term agricultural productivity growth and poverty reduction.
- Administrative requirements for agri-food imports related to food safety, quarantine, product standards and labelling have proliferated in Indonesia. Combined with uneven enforcement and lack of transparency from changing rules, these requirements add to trade costs. To reduce these, Indonesia should clarify and strengthen the scientific basis of these requirements, and improve transparency and consistency in their implementation.

Figure 15.1. Indonesia: Development of support to agriculture



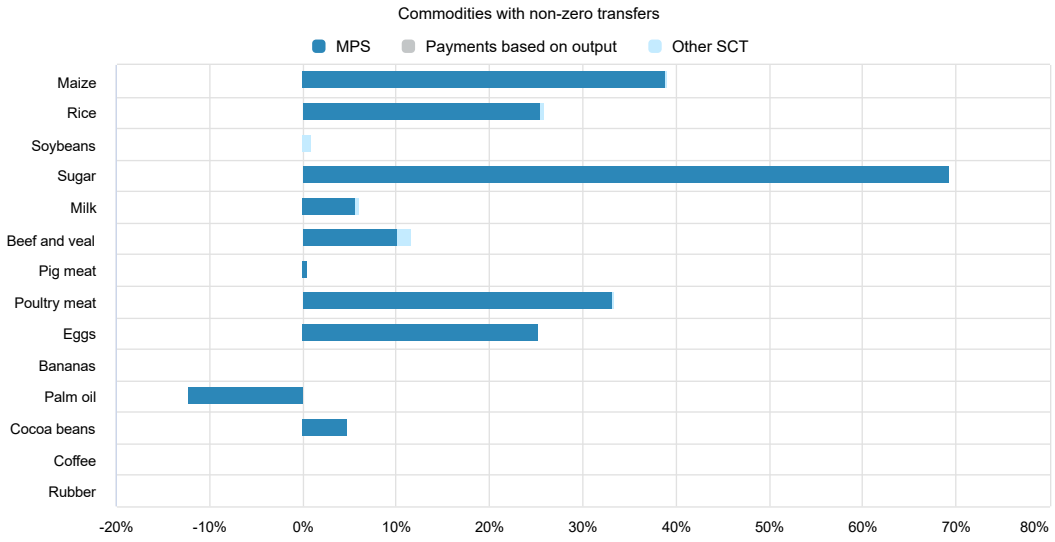
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 15.2. Indonesia: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 15.3. Indonesia: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 15.1. Indonesia: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**23 813**	**114 378**	**113 689**	**115 175**	**114 271**
***of which:** share of MPS commodities (%)*	71.96	74.83	75.20	75.44	73.87
Total value of consumption (at farm gate)	**22 684**	**71 471**	**72 891**	**69 761**	**71 760**
Producer Support Estimate (PSE)	**1 816**	**21 319**	**24 489**	**18 846**	**20 623**
Support based on commodity output	1 723	17 645	21 509	16 510	14 916
Market Price Support[1]	1 723	17 645	21 509	16 510	14 916
Positive Market Price Support	2 321	20 069	23 652	19 104	17 450
Negative Market Price Support	-599	-2 424	-2 143	-2 595	-2 534
Payments based on output	0	0	0	0	0
Payments based on input use	82	3 661	2 967	2 323	5 692
Based on variable input use	19	2 558	2 552	1 842	3 281
with input constraints	0	0	0	0	0
Based on fixed capital formation	59	737	407	410	1 393
with input constraints	1	0	0	0	0
Based on on-farm services	4	365	8	70	1 018
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	11	14	14	13	15
Based on Receipts / Income	11	14	14	13	15
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**7.51**	**18.04**	**20.99**	**16.04**	**17.19**
Producer NPC (coeff.)	**1.08**	**1.20**	**1.25**	**1.18**	**1.16**
Producer NAC (coeff.)	**1.08**	**1.22**	**1.27**	**1.19**	**1.21**
General Services Support Estimate (GSSE)	**623**	**1 862**	**2 082**	**1 840**	**1 663**
Agricultural knowledge and innovation system	45	83	84	84	81
Inspection and control	14	40	41	38	42
Development and maintenance of infrastructure	323	948	947	967	930
Marketing and promotion	0	4	5	3	3
Cost of public stockholding	240	787	1 005	749	607
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**23.29**	**7.57**	**7.43**	**8.33**	**7.02**
Consumer Support Estimate (CSE)	**-1 959**	**-13 981**	**-18 059**	**-11 984**	**-11 900**
Transfers to producers from consumers	-1 993	-15 082	-18 762	-12 913	-13 571
Other transfers from consumers	-316	-1 382	-1 968	-1 294	-885
Transfers to consumers from taxpayers	328	1 416	1 432	1 415	1 401
Excess feed cost	22	1 068	1 239	809	1 156
Percentage CSE (%)	**-8.71**	**-19.92**	**-25.27**	**-17.53**	**-16.91**
Consumer NPC (coeff.)	**1.11**	**1.30**	**1.40**	**1.26**	**1.25**
Consumer NAC (coeff.)	**1.10**	**1.25**	**1.34**	**1.21**	**1.20**
Total Support Estimate (TSE)	**2 767**	**24 597**	**28 003**	**22 101**	**23 687**
Transfers from consumers	2 310	16 465	20 730	14 208	14 456
Transfers from taxpayers	773	9 515	9 241	9 188	10 116
Budget revenues	-316	-1 382	-1 968	-1 294	-885
Percentage TSE (% of GDP)	**1.45**	**2.20**	**2.50**	**2.09**	**2.02**
Total Budgetary Support Estimate (TBSE)	**1 044**	**6 952**	**6 494**	**5 592**	**8 771**
Percentage TBSE (% of GDP)	**0.56**	**0.62**	**0.58**	**0.53**	**0.75**
GDP deflator (2000-02=100)	**100**	**355**	**350**	**348**	**367**
Exchange rate (national currency per USD)	**9 322.08**	**14 350.40**	**14 150.28**	**14 593.09**	**14 307.82**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Indonesia are: maize, rice, soybean, sugar, milk, beef and veal, pig meat, poultry, eggs, bananas, cassava, cocoa beans, coffee, palm oil and rubber.
Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Indonesia's economy was relatively closed to trade for almost three decades from the 1960s to the 1980s. Trade liberalisation started only in the 1990s with the signature of agreements that created the WTO and the ASEAN Free Trade Area (AFTA).

Over the past thirty years, the main priorities of Indonesia's agricultural policy have been food self-sufficiency, food diversification, value added, competitiveness, and farmers' welfare. Agricultural producers benefit from a wide range of input subsidies for fertilisers, seeds, and credits, among others. The number and cost of these programmes grew rapidly since the mid-2000s. Since 1998 the government has increased the minimum producer price of rice, while targeted food (rice) assistance for the poor (Raskin) was introduced, increasing expenditure on food assistance programmes.

Raskin evolved in the last decade, eventually replaced by the food assistance programme Rastra. In early 2017, Indonesia started a pilot BPNT programme that in 2019 became a large-scale programme to provide an electronic food voucher to replace physical rice distribution. These consecutive programmes allowed the Food Logistics Agency BULOG to distribute 10 kg of rice per poor family per month.

Tariffs fell significantly over the last decades. The average tariff on agriculture (excluding alcoholic beverages) dropped from 20% in 1990 to 5% in 2010. Import monopolies, licensing requirements and export restrictions on agricultural products were removed in 1997-98. However, quantitative import restrictions were introduced, notably for rice, sugar and beef. Import requirements imposed for sanitary, phytosanitary and religious/cultural reasons (i.e. halal certification) are significant and potentially stringent. They are often implemented in a non-transparent manner and add to the cost of importing. Export taxes were introduced in 1994 on crude palm oil and its derivatives, and on cocoa in 2010.

Indonesia's current agricultural policies are framed in the 2012 Food Law, which establishes the objectives of "food self-reliance and food sovereignty" (*kemandirian pangan dan kedaulatan pangan*). In practice, the goal is achieving self-sufficiency on staple and strategic commodities (rice, maize, soybean, sugar and beef). The country provides subsidies for input use, particularly fertilisers and seeds.

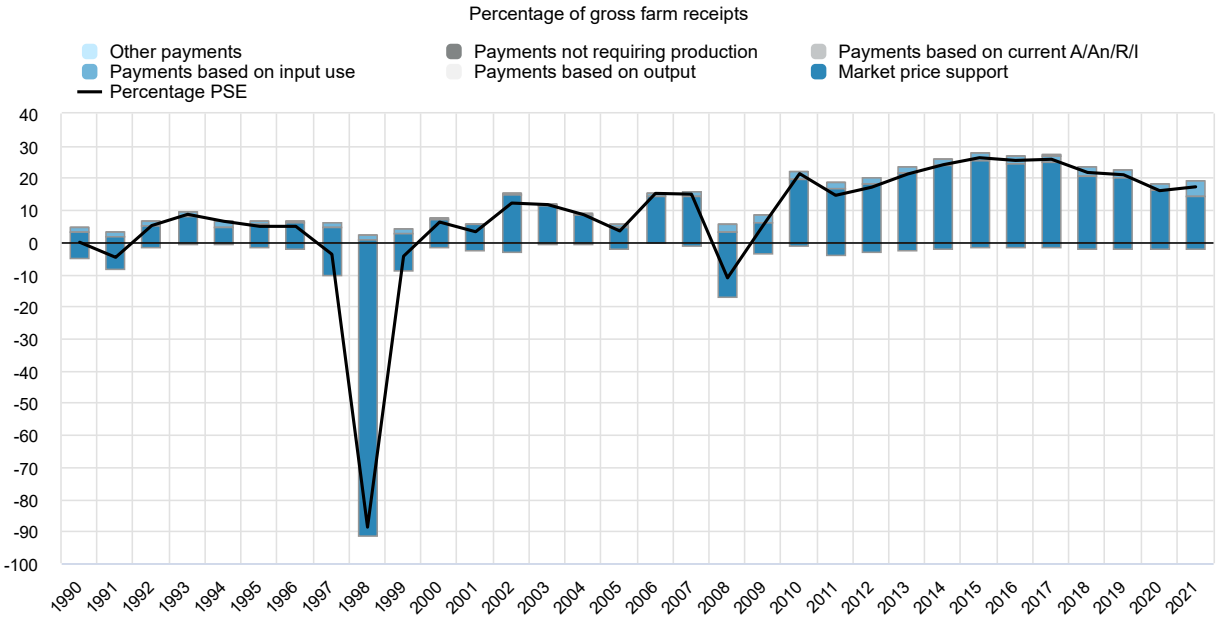
Table 15.2. Indonesia: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
1960s to 1980s	Closed economy Production expansion to avoid social unrest, rise in oil prices and green revolution	Food Logistics Agency (BULOG) established in 1967 and its marketing role expanded Subsidised inputs such as fertilisers, pesticides and credit Significant spending on infrastructure Increased import tariff rates Quantitative control of exports and imports Export taxes on palm oil and its derivatives
1980s – 1996	Trade liberalisation	Abolishment of tariffs, general tariffs reduction programme Trade agreements (URAA, AFTA, APEC) New legislation on export tax on palm oil and its derivatives in 1994 Phase out of input subsidies
1997-1999	Market reform Asian financial crisis	Reduction of BULOG's monopoly powers, particularly in rice markets Reduction of fertiliser subsidy Introduction of targeted rice distribution programme (OPK/Raskin) Tariffs replace import licensing arrangements for sugar Abolishment of local content requirements for dairy and soybeans Temporary removal of export taxes on palm oil and its derivatives

Period	Broader framework	Changes in agricultural policies
2000-2012	Measures to revitalise the agricultural sector in response to poor productivity	Reinstated fertiliser subsidy Increased expenditures in extension services R&D and irrigation Increased tariffs on rice and sugar Quantitative controls on trade in rice, sugar and beef More stringent non-tariff measures Variable export tax on palm oil and its derivatives, and on cocoa
2012-present	2012 Food Law, policy focus on self-sufficiency of staple food (rice, maize, soybeans, sugar and beef)	Increased role of BULOG in rice imports and domestic market Distribution of rice at low prices, first through Raskin programme, then Rastra and finally BPNT electronic vouchers organising rice distribution More input subsidies for fertilisers, seeds and credit. Grant for machineries to targeted farmers' groups New initiative on food estate

Indonesia's producer support estimate was mostly positive over the past 30 years, except during the financial crisis in 1998 and the food crisis in 2008. Support is mostly created by price interventions (tariffs and minimum prices). Export taxes imposed on palm oil and cocoa result in negative support for those commodities, while import tariffs result in positive support to other commodities. Budgetary transfers to producers (input subsidies) and consumers (food aid), are smaller than price support, and have been stable over the past decade.

Figure 15.4. Indonesia: Level and PSE composition by support categories, 1990 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Food Law of 2012 shapes Indonesia's current agricultural policy and set of core objectives. The Food Law sets out the principles of food self-reliance (*kemandirian pangan*) and food sovereignty (*kedaulatan*

pangan) as the applied approach to food security. The law stipulates that domestic food demand be fulfilled by imports if local food sources are insufficient (USDA FAS, 2019[1]). The Law confirms the principles of the Strategic Plan of the Ministry of Agriculture 2020-24: achieving self-sufficiency in the production of selected staple-food commodities (rice, maize, soybeans, sugar and beef) to assure food security; ensuring food prices are affordable for consumers across the archipelago; diversifying production and consumption away from carbohydrates (rice and wheat) towards animal-based products, and fruits and vegetables (particularly root vegetables); raising the competitiveness of agricultural production and value-added processing; increasing the availability of raw materials for bio-industry and bioenergy; and improving the welfare of farmers through higher incomes as a way to reduce the level of rural poverty (OECD, 2012[2]).

Indonesia pursues policy objectives through both domestic and trade measures. Domestic policy measures include minimum purchase prices for rice and sugar; substantial budgetary allocations for inputs; and provision of services to the agricultural sector as a whole, in particular related to irrigation, research and development, and marketing and promotion.

BULOG manages public interventions in the domestic market and imports and has responsibility for market operations aimed at stabilising domestic prices and managing the government rice reserve. BULOG can only buy paddy or rice from farmers when the market price is lower than or equal to the minimum price and must maintain a minimum year-end stock of 2 million tonnes, about 2.5% of annual consumption in Indonesia (USDA FAS, 2019[1]). Only BULOG can import medium-quality rice with a maximum 25% broken grains. However, private companies can import specialty rice such as jasmine rice and basmati rice (USDA FAS, 2018[3]). In 2017, Indonesia introduced ceiling prices on medium- and premium-quality rice at the retail level, which vary across regions. When the retail price exceeds the ceiling, BULOG also releases rice from stocks to the market.

In May 2019, the Rastra food assistance programme was replaced by the BPNT, co-ordinated by the Ministry of Social Affairs (Ministry of Social Affairs (Kementerian Sosial), 2019[4]). Under the BPNT, eligible households receive IDR 150 000 (USD 10.3) per month on a purchasing card that can be used to buy rice at the market price from selected retailers.

A wide range of input subsidies on fertilisers, seeds and credit support agricultural producers. The percentage of subsidy varies across fertiliser types, with urea receiving the highest at 67.2% of the market price (Sudaryanto, 2018[5]). Fertiliser manufacturers receive the subsidy, and then sell fertilisers to farmers at a reduced price. Before the beginning of the planting season, the Ministry of Agriculture (MoA) issues a decree on the estimated demand for different types of fertiliser by provinces, along with the reference retail price of fertilisers. Based on this information, governors of the corresponding provinces break down the demand for fertiliser by district. The decree also serves as a reference for fertiliser companies to distribute fertilisers in the corresponding regions. In addition to the subsidy, the MoA also directly distributes fertiliser to food crop farmers in selected regions.

The MoA encourages encourage small and medium-scale farm businesses through partnerships between private sector and community investment that supports Micro Business Credit/KUR to. One large-scale programme focuses on the development of regional food production centers called the Food Estate (FE) which integrates upstream to downstream activities.

The government of Indonesia invests in irrigation infrastructure. According to the Ministry of Public Works, approximately 84% of Indonesian harvested rice area is irrigated, while the remaining 16% is rain fed (USDA FAS, 2019[1]). Facilitated by savings from reduced fuel subsidies since 2015, the government pushes to improve the irrigation infrastructure, mostly for rice production. Investments in infrastructure complement exemptions in place for water transportation costs: farmers are not charged for the cost of delivering water from the source to the tertiary system via primary and secondary canals.

Indonesia restricts imports of strategic commodities (those associated with self-sufficiency targets: rice, maize, soybeans, sugar and beef). The Food Law sets out the principles that underpin food trade. It

contains provisions restricting staple food exports and imports such as “state food export can only be implemented after fulfilling National Food Reserve and staple food consumption necessity” and “food imports can only be implemented if domestic food production is not sufficient or cannot be produced domestically” (Articles 34 and 36). Trade policy includes both tariff and non-tariff measures. The average applied Most Favoured Nation (MFN) import tariff on agro-food products, excluding alcoholic beverages and spirits, was just over 5% in 2017. Rice and sugar have higher specific tariffs. Import monopolies, licensing requirements and export restrictions on agricultural products ended in 1997-98. However, in the 2000s, quantitative import restrictions and licensing were reintroduced, notably for rice, sugar and beef. Import requirements imposed for food safety and religious reasons are becoming more stringent. Variable export taxes were introduced on crude palm oil and derivatives in 1994, then on cocoa (OECD, 2012[2]). The MFN tariff schedule is updated every five years by the Ministry of Finance (BukuTarif dan Kepabeanan Indonesia, BTKI or MoF). The latest tariff schedule was released in 2017.

Since 2008, companies must receive Ministry of Trade approval as registered importers for a range of processed products manufactured from meat, cereal, sugar and cocoa. Similar restrictions were placed on imports of animals in 2011. In line with the Ministry of Trade regulation on the Import and Export of Animals and Animal Products issued in September 2011, these imports can only be carried out if the domestic production and supply are not sufficient to meet consumer demand at an affordable price.

A variable export tax on cocoa and palm oil was put in place in 2010 and 2015, respectively. The tax rate on Crude Palm Oil (CPO) depends on reference prices and is zero for prices below USD 750 per tonne. When reference prices exceed this level, the tax is imposed on a sliding scale between USD 3 and USD 200 per tonne. Since 2015, the government collects an additional export levy for palm oil of USD 55/tonne on top of the variable export tax to finance subsidies to biodiesel, infrastructure, R&D projects on palm oil, replanting in small farms, market promotion and human resource development.

To reduce the dependency of fossil fuel the government policy has been focused in the last two decades in shifting from fossil fuels consumption to biofuels mainly from palm oil, introducing in 2006 the first regulation on biofuel development. The Ministry of Energy and Mineral Resources (MERM) led the research and development process and started a mandate to use biofuels in transportation in 2008, starting from B2.5 and B7.5. Indonesian biodiesel mandates expanded in 2015 with the MERM Regulation 12/2015 establishing a 10% biofuel blending requirement. Since then the biofuel blending rates has been progressively increasing to its current level of 30% for biodiesel across all uses (Halimatussadiah et al., 2021[6]). To ensure the success of the blending mandate, the Indonesia Oil Palm Estate Fund (BPDP) provides a subsidy to biofuel producers. The BPDP collects the additional export levy and redistributes it to biofuels producers selling their products domestically. In 2021, 16% of palm oil production was dedicated to biofuels, 94% of which were consumed domestically. A moratorium on the issuance of licenses for new palm oil plantations entered into force in 2018, in an attempt to combat the palm oil-driven deforestation and loss of peatland, followed by a Presidential Instruction on National Action Plan on Indonesian Sustainable Palm Oil 2019-2024.

Indonesia is a member of the Association of Southeast Asian Nations (ASEAN), Asia-Pacific Economic Cooperation (APEC), and World Trade Organization (WTO). It participates in trade liberalisation between ASEAN members and their major trading partners in the region, including China, Japan, India, Korea, Australia and New Zealand. The ASEAN economies committed in 2015 to complete the formation of the ASEAN Economic Community by 2025. This is intended to develop a single market and production base, a highly competitive economic region, a region of equitable economic development, and a region fully integrated into the global economy (ASEAN Secretariat, 2017[7]).

Climate change mitigation policies in agriculture

Targets and policy measures to reduce greenhouse gas emissions from agriculture

Total GHG emissions in Indonesia increased during 2000-18 from about 1 000 to 1 637 $MtCO_2eq$, 56% of which correspond to agriculture, forestry and other land use. According to "The State of Indonesia's Forest" (MoEF, 2021[8]), deforestation and forest degradation were the largest contributors to GHG emissions in 2018 (44.19%) followed by fuel and electricity (36.38%). Agriculture represents 13%. Efforts to reduce GHG emissions focus on converting from fossil fuels to biofuels, mostly palm oil, which impacts land use. The government is also willing to reduce GHG emissions in other sectors, such as AFOLU, to improve environmental sustainability of exported commodities, which would facilitate more advantageous access to European markets of products such as palm oil, cocoa, coffee and rubber. Indonesia also participates in the Global Methane Pledge initiative.

Indonesia submitted its updated Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) in July 2021. It aims to reduce GHG emissions 29% by 2030 compared to business-as-usual,[1] or by 41% contingent on sufficient international financial support. Indonesia plans to peak GHG emissions in 2030 and could reach net-zero GHG emissions by 2060 or sooner (WRI, 2021[9]). The NDC includes adaptation measures for a long-term strategy that targeted net-zero emissions by 2060 or earlier.

A USD 1 billion forest and climate partnership with Norway ended abruptly in June 2021 when the moratorium on palm oil concessions introduced in 2018 expired without plans for a replacement, sending mixed signals about Indonesia's commitment to tackle the climate crisis.

Indonesia's Long-Term Strategy for Low Carbon and Climate Resilience 2050

Indonesia's Long-Term Strategy for Low Carbon and Climate Resilience (LTS-LCCR) 2050 aims to contribute to global mitigation goals while achieving national development, and finding a balance between objectives for emissions reduction, economic growth, justice and climate-resilience. According to this strategy, the AFOLU sector could become a net sink by 2050 under the Current Policy Scenario (CPoS), and by 2030 under the Low Carbon and Climate Resilience Scenario (LCCP). The strategy states that the latter, more ambitious LCCP objectives will be achieved only with international support to increase investment, technology and capacity-building. Economic growth is expected in all scenarios: 0.61% for CPoS and 0.62% for LCCP (Government of Indonesia, 2021[10]).

The long-term strategy suggests technologies to apply to the agricultural sector, accompanied by qualitative targets. They include: (1) adoption of low-emission varieties and water-saving cultivation systems in paddy fields; (2) utilisation of manure for biogas, and livestock feed improvement in livestock management; and (3) reduced use of synthetic fertiliser. The ambition is for sustainable intensification, improved productivity and advanced technology to reduce the pressure on forest areas and avoid deforestation. Under CPoS, low-emission rice varieties are expected to cover 0.93 million hectares by 2030 and 1.96 million hectares by 2050 – the latter corresponding to approximately 24% of the total rice field area. The CPoS and LCCP set similar targets for biogas implementation, accounting for 41 000 heads in 2030 and 94 000 heads in 2050. However, these numbers remain low compared to the national livestock population (18 million heads in 2021) due to the high investments required for biodigester and flaring facilities. Application rates of urea under CPoS would decrease from 0.1183 tonnes/ha in 2010 to 0.1174 tonnes/ha in 2050. The adoption of mitigation practices may result in further reductions in the use of urea in 2030 and 2050.

Market-based instruments

The government passed a bill to reform tax structures and reduce the budget deficit created by measures to combat the impacts of COVID-19. This reform included the creation of a carbon tax initially limited to coal power plants, in line with Indonesia's commitment to curb GHG emissions over the next decade. The tax will be set at a minimum of IDR 30 per kilogramme of carbon dioxide equivalent (USD 2.1 per $MtCO_2eq$) starting from April 2022. The government is working on a presidential decree on the economic value of carbon to develop a broader carbon tax mechanism based on emission limits (cap and tax) and a carbon exchange where companies can trade their emissions permits. Carbon pricing will eventually reach other sectors in the economy. The objective is to fully implement the carbon exchange in 2025, applying a gradual expansion of carbon taxation and carbon tax management regulations to other sectors (Jakartaglobe, 2021[11]). It was not clear as of January 2022 if this will include agriculture.

Research and development (R&D)

The climate change strategy of the agricultural sector includes mitigation and adaptation for increased resilience through climate-smart agriculture. It aims to achieve self-sufficiency and farmer welfare, while considering the value of reducing carbon emissions.

Certain R&D and extension programmes focus on climate smart practices and technologies, including: (1) development of plant varieties resistant to climate stress and plant pest; (2) development of a planting calendar adjustment system that takes climate change into account; (3) development of water-balance modelling and plant nutrition on agricultural land, and a geographic information system for distribution points of nutrients and water; and (4) development of efficient agricultural equipment and machinery for agricultural production processes. They are implemented by the Indonesian Agency of Agriculture Research and Development (IAARD).

Domestic policy developments in 2021-22

The budget of the MoA decreased in recent years, from IDR 32.7 trillion (USD 2.44 billion) in 2015 to IDR 15.8 trillion (USD 1.09 billion) in 2020, but increased to IDR 16.3 trillion (USD 1.15 billion) in 2021. The budget reduction in 2020 was largely due to a budget reallocation to finance the COVID-19 policy response, including in agriculture, and specifically an initiative to strengthen food availability. The total budget for food security, administered by several ministries, has also increased from IDR 80 trillion in 2020 to IDR 99 trillion in 2021.

In 2021, the MoA published the Standard in Business Activity and Product to guide the Implementation of Business Licensing. Following up on Indonesian Law on Job Creation, this regulation defines the standards applied to companies registering for a business license. It aims to improve the business climate in the agricultural sector and to increase investment and access to private services.

The MoA in collaboration with the insurance company PT Jasindo offers insurance known as AUTSK (Asuransi Usaha Ternak Sapi/Kerbau). In 2021, PT Jasindo launched a new more advanced digital application Protan (Proteksi Pertanian) or Agriculture Protection App. MoA aimed the crop insurance to cover 1 million hectares, and the cattle insurance to cover 120 000 heads, in 2021. Eighty per cent of the annual crop insurance fee is covered by the government subsidy. Farmers can receive up to IDR 6 million (USD 0.4 thousand) per hectare if production fails, while pay-outs for dairy cattle are about IDR 10 million (USD 0.7 thousand) per head if the cattle died or IDR 5 million (USD 0.35 thousand) if the cattle are sick and slaughtered.

To strengthen food security, Indonesia established a National Food Agency (NFA, or Badan Pangan Nasional BAPANAS) in 2021. This new agency is under the direct authority of the President of Indonesia and has the task of co-ordinating the main government duties in the food sector, substituting the former

Food Security Agency that was under the authority of the MoA (GoI, 2021[12]). NFA controls and stabilises stocks and prices of nine food commodities: rice, corn, soybeans, sugar (for direct consumption), shallot, chilly, eggs, beef, and chicken meat.

The new NFA has five strategic objectives: (1) stabilising food prices at the producer and consumer levels; (2) maintaining food availability across time and regions; (3) formulating food importation policy; (4) achieving food and nutrition security for all; and (5) ensuring the safety of food traded or distributed. To carry out those tasks, some competencies belonging to other ministries were transferred to NFA, namely: (1) food import policy from the Ministry of Trade; (2) food reserves policy from the MoA, including food price policies; and (3) food reserve management previously supervised by BULOG and the Ministry of State-Owned Enterprises (SOEs). NFA also manages food safety in co-ordination with the Food and Drug Monitoring Agency/BPOM (Suryana, 2021[13]).

In 2021, Indonesia also established the National Research and Innovation agency (*Badan Riset dan Inovasi Nasional: BRIN*) (GoI, 2021[12]). The objective is to implement a more integrated approach to research and development (R&D) and innovation across all sectors and disciplines led by the Ministry of Research and Technology, including four non-ministerial government agencies, and 48 R&D ministerial institutions. The research agency IAARD under the MoA is to transfer 1 000 of their researchers to BRIN, while the remaining 1 800 staff, mainly non-researchers, focus on technology transfer and dissemination, in particular for small scale farmers.

Integration of R&D activities seeks to avoid budget inefficiencies and overlap of activities in different institutions. The challenge for the BRIN is to ensure a smooth management of the transition and the co-ordination with the sectoral Ministries, including the MoA, in delivering research results, to ensure the long term viability of this new governance structure (Sudaryanto and Rafani, 2021[14]).

Climate Change Adaptation measures

The government has included climate resilience as part of the agenda in the National Medium-term Development Plan (RPJMN) 2020-2024 which includes as 6th National Priority “Building Environment and Enhancing Disaster Resilience under Climate Change”. The target is to reduce the potential impact of extreme weather and climate related events on the economy by 1.15% of GDP in 2024. This target is expected to be achieved through four strategies, namely: (1) Protecting the vulnerable in the coastal and marine sectors; (2) Improving water security; (3) Increasing climate resilience in the agricultural sector; and (4) Protecting the health sector from climate impacts.

According to the RPJMN 2020-2024, the agricultural sector is targeted to contribute to the resilience of the whole economy reducing its total potential economic loss by 0.21% of GDP by 2024. This target is planned to be achieved by increasing agricultural productivity and resilience with protection against floods, drought, and pest outbreaks, training farmers to increase their understanding of good on farm practices.

Law Number 22/2019 on Sustainable Agricultural Cultivation System prescribes the use of low emission practices such as the use of low emission intensity rice varieties (such as Inpari or Cisadane) and rehabilitation of abandoned land and water management. It seeks to improve agricultural productivity, increasing farmers’ income, and striving for water availability by adapting practices to the environmental conditions of production (Government of Indonesia, 2021[10]). The law integrates environmental, social, cultural and economic aspects in order to account for the carrying capacity of the ecosystem, the adaptation needs to climate change and the food security objectives. There are three classifications of location-based climate resilience action, based on its priority: (1) the “super-priority” areas due to high potential hazards, high vulnerability, and high risk; (2) the “top priority” areas; and (3) the priority areas. This classification will be considered for funding allocation for infrastructure, technology and capacity building.

Trade policy developments in 2021-22

Indonesia assumed the G20 Presidency during 2022 at the 15th G20 Summit in Riyadh (Saudi Arabia) on 22 November 2021. The MoA will lead the G20 Agriculture Working Group (AWG) under the theme "Balancing Food Production and Trade to Achieve Food for All" (Ministry of Agriculture, 2021[15]). Indonesia has identified three priority areas: (1) building resilient and sustainable agriculture and food systems; (2) promoting open, predictable and transparent agricultural trade to ensure food availability and affordability for all; and (3) innovative agri-entrepreneurship through digital agriculture to improve livelihood of farmers in rural areas.

Indonesia signed the Regional Comprehensive Economic Partnership (RCEP) on 15 November 2020, together with other 14 countries in the Asia-Pacific region. RCEP took effect on 1 January 2022 and combines and deepens a number of existing bilateral and regional agreements. It represents the largest free trade agreement in the world covering around 30% of both the global population and global GDP.

Contextual information

Indonesia is the fourth most populous country in the world, and its large population contines to grow rapidly, and contributes to a high population density of 151 inhabitants per km^2. Indonesia is also one of the world's largest agricultural producers. The importance of agriculture in the economy has been falling over the last two decades, but the sector still accounts for almost 14% of GDP. The reduction in the share of the work force employed in the agriculture sector has been proportionally much larger, declining from 45% in 2000 to 28% in 2020, with a significant increase in the average production per employed person in the sector.

Indonesia is a net agro-food exporter and an increasing share of its total exports come from the sector (21.6% in 2020). The country is also a large importer of agro-food products. Total agricultural area in Indonesia has increased by almost one-third in the last two decades and currently represents 2.1% of the agricultural land in all countries covered in this report. While food crop production is predominantly based on small family farms, there are large commercial farms producing perennial crops, particularly palm oil.

Indonesia's economy has a solid growth record, at around 5% per year between 2000 and 2019. Real income per capita in 2020 more than doubled since 2000. In 2020, GDP decreased by 2.1% as a consequence of the COVID-19 pandemic and related restrictions, but economic growth was back in 2021 at 3.3%. The inflation rate has been steadily decreasing from 6.4% in 2015 to less than 1.6% in 2021, while the rate of unemployment was 4.1% in 2020.

The value of agro-food exports and imports has oscillated around a slowly increasing trend since 2011, with USD 35.2 billion of exports and USD 19.3 billion of imports in 2020. Around 73% of agro-food exports are processed products to be further transformed by industries in other countries such as rubber and palm oil. A similarly significant share of agro-food imports (71%) are destined for further processing in Indonesia.

Table 15.3. Indonesia: Contextual indicators

	Indonesia		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	1 098	3 302	2.7%	3.0%
Population (million)	205	274	4.8%	5.2%
Land area (thousand km²)	1 878	1 878	2.3%	2.3%
Agricultural area (AA) (thousand ha)	47 177	62 300	1.6%	2.1%
			All countries[1]	
Population density (inhabitants/km²)	117	151	53	63
GDP per capita (USD in PPPs)	5 352	12 073	9 281	20 929
Trade as % of GDP	26	14	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	15.6	13.7	2.9	4.9
Agriculture share in employment (%)	45.3	27.7	-	-
Agro-food exports (% of total exports)	6.8	21.6	6.2	8.5
Agro-food imports (% of total imports)	12.7	13.7	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	84	75	-	-
Livestock in total agricultural production (%)	16	25	-	-
Share of arable land in AA (%)	43	42	32	34

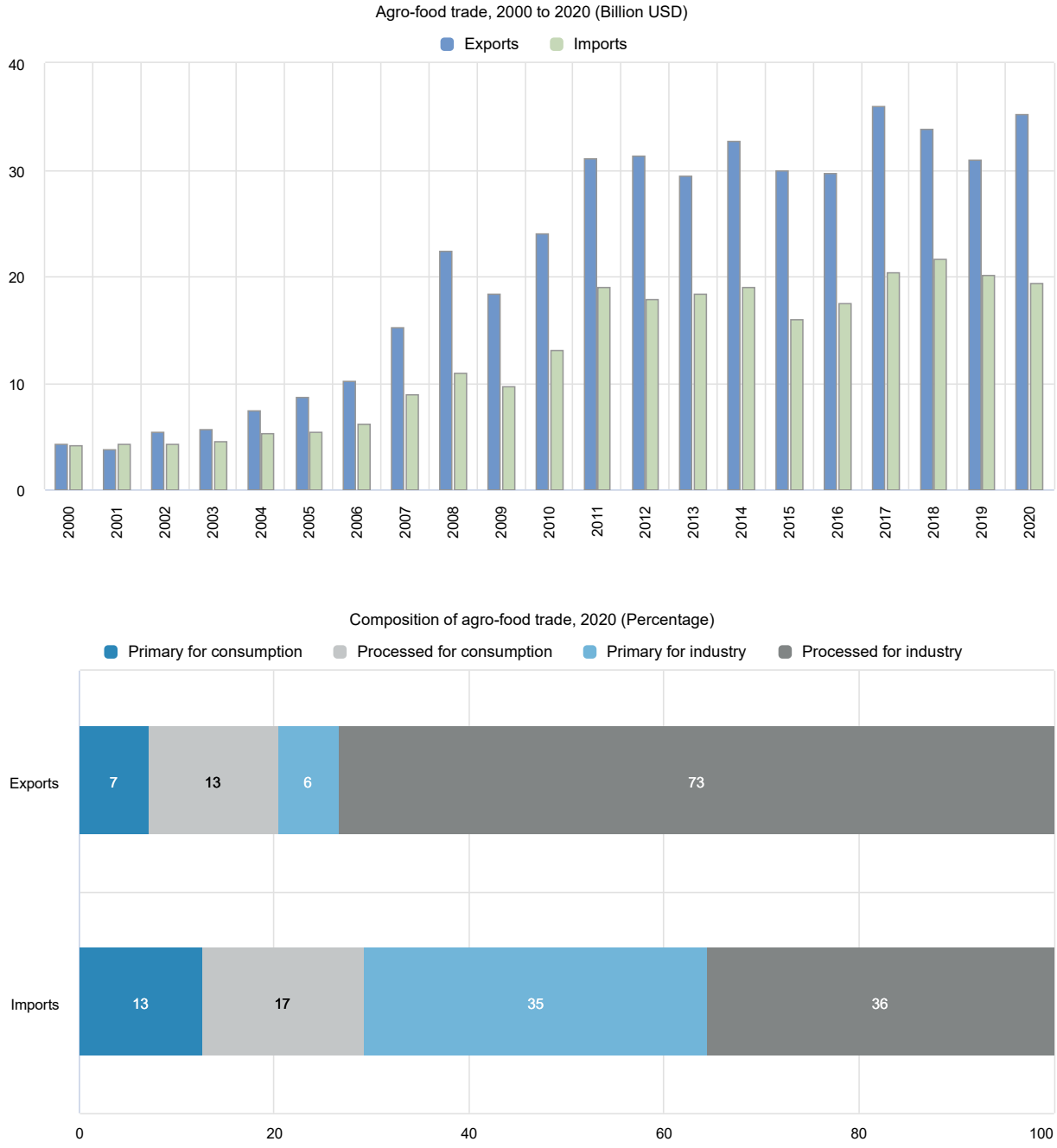
Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 15.5. Indonesia: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 15.6. Indonesia: Agro-food trade



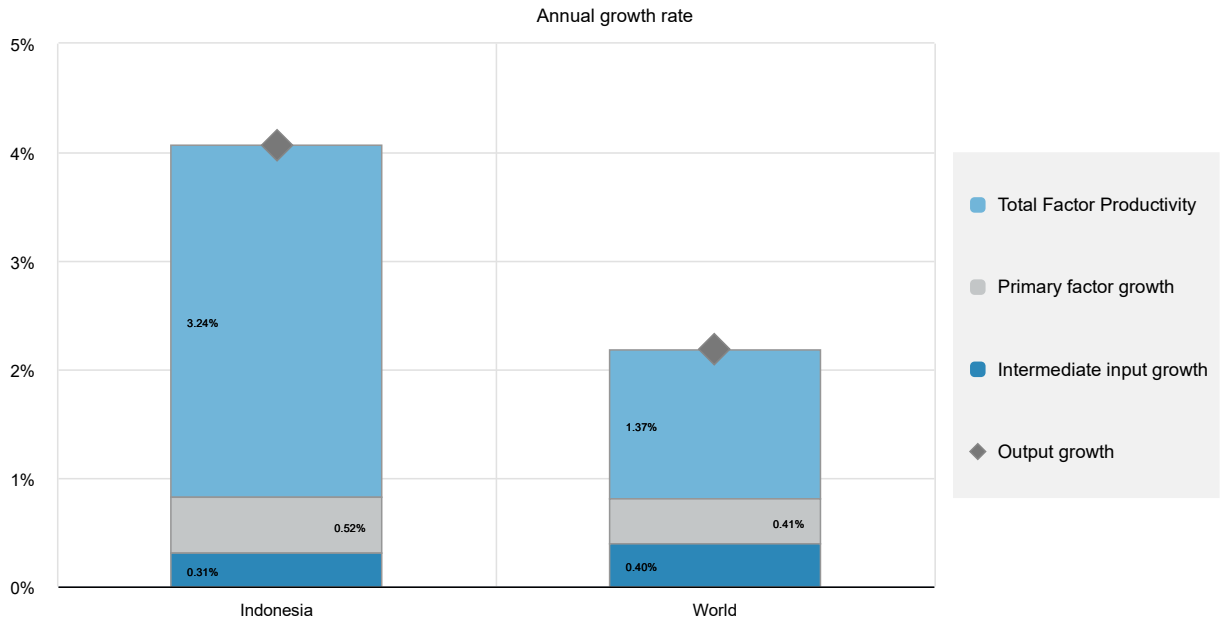
Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Indonesia's agricultural production increased at an annual rate of 4.1% in 2010-19. Most of this growth is productivity-driven: Total Factor Productivity (TFP) has increased by 3.2% per year, representing technological improvements and improved efficiency to combine different production factors. Additional primary factors, including land, and intermediate inputs have contributed an additional 0.5 and 0.3 points

to the production growth, respectively. Unlike in the 1990s, Indonesia's growth in output and TFP has significantly outperformed the global averages during the last 10 years.

Indonesian agriculture accounts for an increasing share of national water extractions, which was 85.2% in 2020. However, the sector's shares of energy used has fallen since 2000 to 1.2% in 2020, while the share of GHG emissions has remained relatively stable at 13.3% in 2020. The country's phosphorous balance is below the OECD average, while the nitrogen balance has decreased in the last two decades to significantly negative levels in 2020.

Figure 15.7. Indonesia: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 15.4. Indonesia: Productivity and environmental indicators

	Indonesia		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.0%	3.2%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	17.9	-62.4	32.1	30.0
Phosphorus balance, kg/ha	1.5	1.7	3.4	2.9
Agriculture share of total energy use (%)	2.4	1.2	1.7	2.0
Agriculture share of GHG emissions (%)	13.2	13.3	8.6	9.7
Share of irrigated land in AA (%)	10.3	..	-	-
Share of agriculture in water abstractions (%)	79.3	85.2	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Note

[1] The Business as usual scenario (BAU) implies an increase in GHG emissions of 115% higher than the level of emissions in 2010 (see Table 1 in (Government of Indonesia, 2021[10]))

16 Israel

Support to agriculture

Despite efforts to introduce market-oriented reforms and temporary measures to lift trade restrictions early in the COVID-19 pandemic, total support to agriculture in Israel continued to increase from 2019 to 2021. The total support estimate (TSE) amounted to 0.4% of GDP in 2019-21.

The share of producer support in gross farm receipts (PSE) reached 14% in 2019-21, under the OECD average and below the 2000-02 level of 19%, but above levels seen in the early 2010s. At the same time, the 91% share of potentially most-distorting forms of support remains much higher than the OECD average. This can be explained by the persistence of domestic price support and border measures in favour of several meat and dairy products, and selected fruits and vegetables. Poultry and milk producers benefit from the largest share of market price support, accounting for 48% of the total producer support in 2019-21.

Single commodity transfers (SCT) represented 85% of the PSE in 2019-21. Market price support is the main component of SCT: poultry, tomatoes, eggs, apples and bananas have the highest share of SCT in commodity gross farm receipts.

The share of general services support estimates (GSSE) in total support in 2019-21 amounted to 3% of the value of the agriculture production, slightly below the OECD average, and the same proportion as in 2000-02. These expenditures focused mostly on agricultural innovation and infrastructure.

Recent policy changes

To facilitate agriculture policy reforms, the government introduced Decision no. 213 in August 2021, “Increasing competition in agriculture and streamlining regulation processes in the field of imports”. Though the implementation acts of the Decision are still under discussion, it aims to reduce customs for fresh produce and ease import procedures. It also includes commitments for more investments in agriculture innovation and proposes a shift towards direct support to farmers.

The 2021 Dairy Agreement sets out the policy for local production and import of dairy products to Israel for the coming years. It leaves open the possibility to re-discuss the target price mechanism by 2026, and exempts imports of specific dairy products from customs. In parallel, the government eliminated customs charges on butter to prevent shortages and lower living expenses.

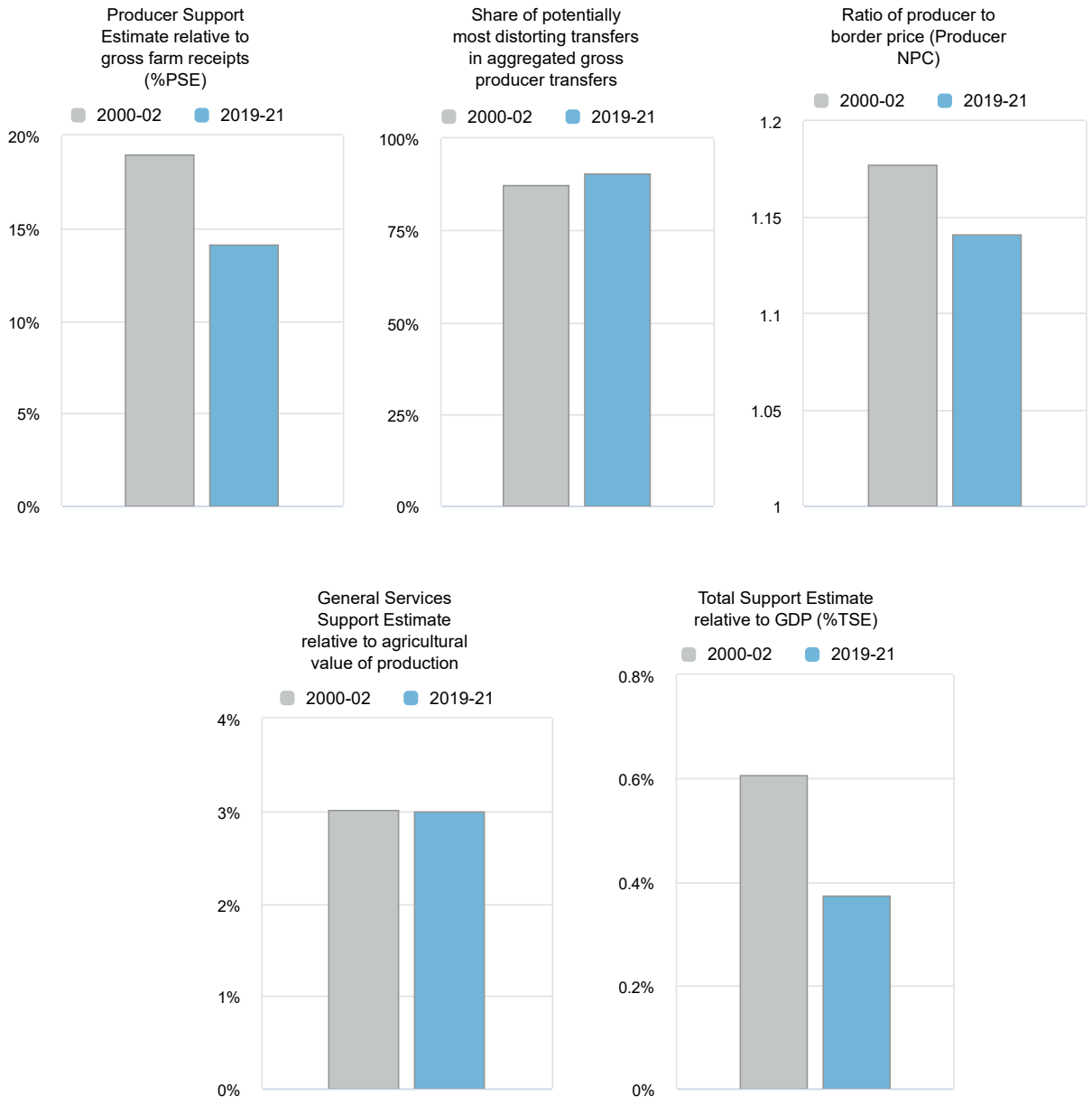
An inter-ministerial committee was assembled to establish Israel’s vision, goals and objectives for Israel’s climate-ready and sustainable food system for 2030, and to promote integration of climate change assessment and adaptation actions in planning and policy.

Free trade agreements (FTAs) with the European Free Trade Association (EFTA) signed in 2018, the FTA with Ukraine signed in 2019, the United Kingdom-Israel Free Trade Agreement, and a related protocol for the mutual recognition of organic produce entered into force in 2021.

Assessment and recommendations

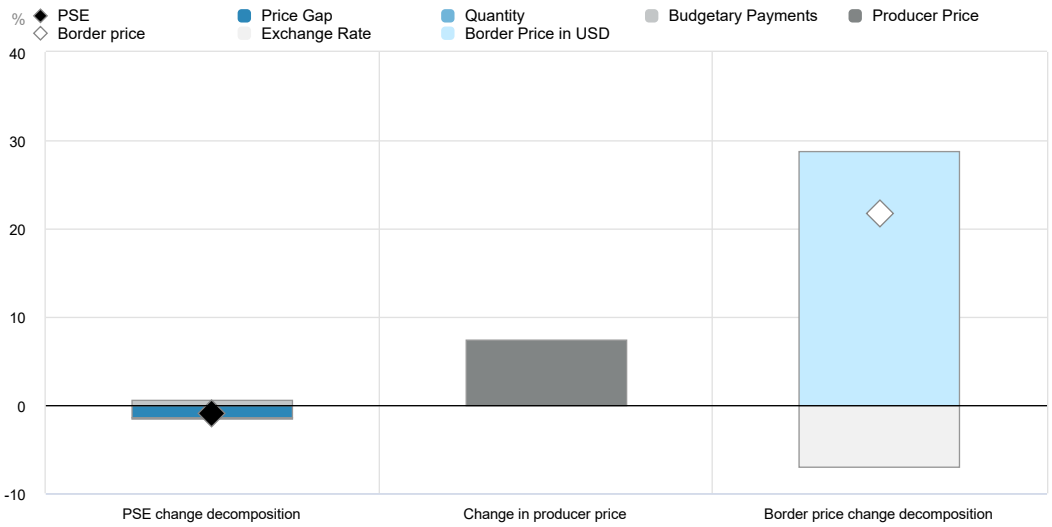
- Tackling climate change requires effective action to limit greenhouse gas (GHG) emissions arising from the agriculture and food sector. While direct GHG emissions from agriculture represent a small share of emissions, this should not prevent the government from including the sector in national targets and the Nationally Determined Contribution (NDC). GHG emissions generated by the sector's activities, energy and water needs should be fully accounted for in mitigation efforts. This requires quantifying emissions associated with current activities and mitigation efforts.
- The level of support to agriculture in Israel remained relatively stable between 2019 and 2021, but some commodities remain insulated from international markets. The focus on price support distorts markets, taxes consumers, and can harm the environment.
- International price inflation and market tensions associated with recovery from the COVID-19 pandemic and Russian aggression against Ukraine should further encourage the Israeli Government to pursue the needed reforms proposed under Decision no. 213.
- While the new dairy sector agreement, the exemption of customs on butter and the gradual tariff reform of the beef sector are steps to limit market distortions, several commodities remain subject to high levels of border protection. Israel maintains high tariffs for goods such as poultry meat, sheep meat, and certain fruits and vegetables. These could be gradually removed and replaced temporarily by direct payments, if necessary. The tariff system for agriculture should also be simplified, avoiding non-ad-valorem tariffs.
- Expenditure on agricultural knowledge and innovation systems declined since 2019, after multiple years of steady growth, which may limit the future productivity and environmental performance in the sector. From 2010 to 2019, production was driven by inputs rather than innovation, as measured by total factor productivity (TFP), which is not sustainable in the long term. Additional funding could be made available by redirecting market-distorting subsidies, which amounted to about ILS 340 million (USD 100 million) annually from 2019-21, towards agriculture knowledge and information systems.
- Israel's skilled farmers, continued investments and comprehensive water management system enable it to sustain a productive agricultural sector under very intense water stress, and contribute to the sector's adaptation to water risks. Still, sustainability and flexibility could be improved by ensuring that farmers are charged water prices in line with marginal costs of supplying water, by facilitating further trading in water allocations among irrigating farmers and other water users, and by using optional compensations for unused water quotas in severely dry years.
- The government should build on recent initiatives to limit the sector's GHG emissions and other negative environmental impacts. This includes reducing the high and rising nitrogen surplus associated with agriculture production, and limiting methane emissions generated by livestock activities. Regional agri-environmental programmes should be scaled up and complemented by targeted policies and regulations incentivising better environmental performance. R&D and agriculture extension activities should encourage environmental improvements. Reforming the most-distorting agriculture support policies, particularly in the case of animal production, would also contribute to that effort.

Figure 16.1. Israel: Development of support to agriculture



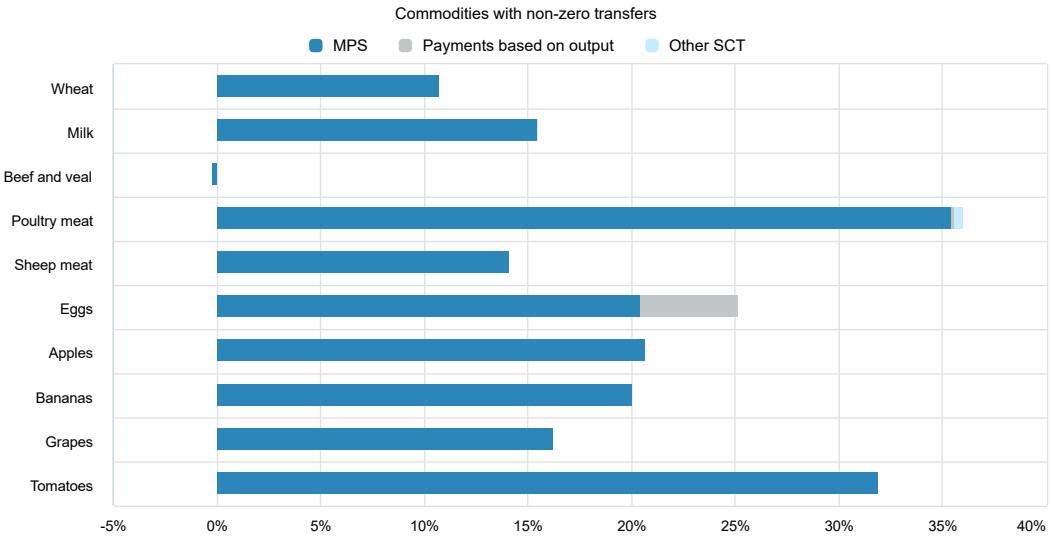
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 16.2. Israel: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 16.3. Israel: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 16.1. Israel: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**3 337**	**9 122**	**8 639**	**8 956**	**9 772**
***of which:** share of MPS commodities (%)*	58.28	60.54	59.08	60.95	61.59
Total value of consumption (at farm gate)	**3 635**	**11 504**	**10 617**	**11 329**	**12 566**
Producer Support Estimate (PSE)	**680**	**1 324**	**1 074**	**1 410**	**1 488**
Support based on commodity output	485	1 115	887	1 200	1 258
Market Price Support[1]	475	1 098	871	1 184	1 239
Positive Market Price Support	489	1 099	872	1 185	1 240
Negative Market Price Support	-14	-1	-1	0	-1
Payments based on output	10	17	16	16	19
Payments based on input use	160	116	110	112	126
Based on variable input use	106	86	79	82	96
with input constraints	0	0	0	0	0
Based on fixed capital formation	42	15	18	16	11
with input constraints	0	0	0	0	0
Based on on-farm services	12	15	14	14	18
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	25	87	72	91	97
Based on Receipts / Income	21	68	52	73	78
Based on Area planted / Animal numbers	4	19	20	18	19
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	8	6	5	7	7
With variable payment rates	5	6	5	7	7
with commodity exceptions	0	0	0	0	0
With fixed payment rates	2	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	1	0	0	0	0
Percentage PSE (%)	**19.02**	**14.12**	**12.15**	**15.36**	**14.85**
Producer NPC (coeff.)	**1.18**	**1.14**	**1.12**	**1.16**	**1.15**
Producer NAC (coeff.)	**1.23**	**1.16**	**1.14**	**1.18**	**1.17**
General Services Support Estimate (GSSE)	**100**	**273**	**245**	**304**	**272**
Agricultural knowledge and innovation system	51	106	106	109	103
Inspection and control	16	26	25	29	25
Development and maintenance of infrastructure	10	120	96	143	121
Marketing and promotion	11	1	1	2	1
Cost of public stockholding	12	11	9	12	11
Miscellaneous	0	9	7	9	11
Percentage GSSE (% of TSE)	**12.96**	**17.16**	**18.55**	**17.73**	**15.44**
Consumer Support Estimate (CSE)	**-612**	**-1 537**	**-1 283**	**-1 534**	**-1 795**
Transfers to producers from consumers	-446	-1 096	-865	-1 176	-1 247
Other transfers from consumers	-172	-444	-420	-359	-551
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	5	3	3	2	4
Percentage CSE (%)	**-16.60**	**-13.33**	**-12.09**	**-13.54**	**-14.28**
Consumer NPC (coeff.)	**1.20**	**1.15**	**1.14**	**1.16**	**1.17**
Consumer NAC (coeff.)	**1.20**	**1.15**	**1.14**	**1.16**	**1.17**
Total Support Estimate (TSE)	**781**	**1 597**	**1 318**	**1 714**	**1 759**
Transfers from consumers	617	1 540	1 286	1 535	1 799
Transfers from taxpayers	335	501	453	537	512
Budget revenues	-172	-444	-420	-359	-551
Percentage TSE (% of GDP)	**0.61**	**0.37**	**0.33**	**0.42**	**0.37**
Total Budgetary Support Estimate (TBSE)	**305**	**499**	**447**	**530**	**521**
Percentage TBSE (% of GDP)	**0.24**	**0.12**	**0.11**	**0.13**	**0.11**
GDP deflator (2000-02=100)	**100**	**133**	**131**	**132**	**136**
Exchange rate (national currency per USD)	**4.34**	**3.41**	**3.56**	**3.44**	**3.23**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Israel are: wheat, cotton, groundnuts, peanuts, tomatoes, peppers, potatoes, avocados, bananas, oranges, grapefruit, grapes, apples, carrots, easy peelers, dates, milk, beef and veal, sheep meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Agriculture was a priority for Israel during its early years for three main reasons. First, the state needed to settle undeveloped areas of the country for geopolitical security. Second it wanted to avoid food shortages, due in part to an inability to import agricultural products from surrounding countries. Third, it needed to provide employment and livelihood for new immigrants to Israel (OECD, 2010[1]). Its objectives are still to improve food supply and self-sufficiency in agricultural products that can be produced locally, expand existing export markets, and maintain the rural population, particularly in the peripheral areas.

Over the past thirty years, Israel implemented a number of reforms related to the provision of subsidies, central planning of agricultural industries, and the allocation of production quotas, price controls and import protection. Major reforms in the agricultural sector began in the early 1990s with trade and market reforms limiting the role of the state in agricultural markets, including in central planning, consumer prices, and export and import policies for specific commodities. Reforms continued into the 2000s with a focus on competitiveness and gradual efforts to limit interventions in the dairy and beef sectors. Most recently, in 2021 the government renewed its impetus to reform in order to lower food prices. Despite these, the country continues to support its agriculture with price controls, import tariffs and payments to farmers (Table 16.2).

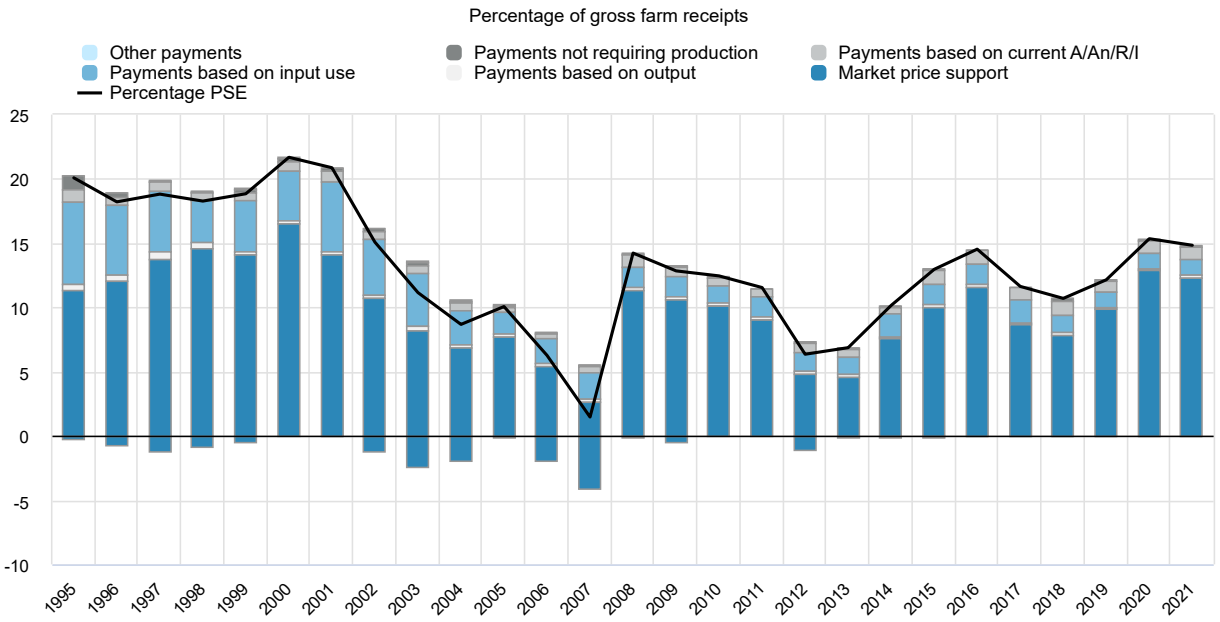
Table 16.2. Israel: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
1985-1990	Trade liberalisation General economic reforms	Economic stabilisation programme Privatisation of state-owned enterprises Dismantling of state grain trading (imports) agency Dismantling of regional co-operatives Debt restructuring and write offs Fruit and vegetable production quotas abolished
1991-1994	Market and trade reforms (export liberalisation)	Gradual abolition of state monopoly of fruits and vegetables exports State meat trading replaced with the Kosher Meat Import Law Consumer price controls removed (except milk, eggs and flour) Reform of agricultural production and marketing boards (diminishing functions) Changes in water pricing Uruguay Round Agricultural Agreement
1995-1999	Trade reforms (import liberalisation)	Non-tariff barriers removed and ceiling binding Broiler sector reformed Reduction of 40% of fresh water use for agriculture FTAs signed
2000- 2010	Focus on competitiveness	Foreign exchange controls abolished Dairy sector reform Abolished minimum prices and surplus removal for fruit and vegetables Abolition of broiler production quotas Farmers' agreement on water charges and water supplies FTAs signed
2010-2021	Continued efforts to reform key sectors	Reform agreement in the beef sector opening import quotas Dairy sector planning law 2011, second dairy agreement in 2021 Eggs reforms discussed Measures to improve the agriculture marketing systems Water price reforms for equity reasons FTAs signed

Over the last 20 years, trends in producer support in Israel, expressed as percentage of gross farm receipts, encompassed four main phases: (1) a steady reduction until the food crisis of 2007-08; (2) a rapid rebound in support with this crisis, leading to a plateau in 2008-11; then (3) a fall and new increase in

support from 2012-16; and (4) fluctuating levels since 2016. Fluctuations in agricultural support are largely attributable to market price support (and to input support early-on), as budgetary support to producers remained relatively stable. The market price support results largely from guaranteed minimum prices and import tariffs, while budgetary support is mostly provided based on current production and input use (Figure 16.4).

Figure 16.4. Israel: Level and PSE composition by support categories, 1995 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The government is involved in **allocating key factors of production**, including land, water and foreign labour. Land and water resources are almost entirely state-owned. Land is allocated to farmers for a nominal fee and is not tradeable. Water is allocated to farmers through a quota system; all water consumption is metered and charged. The government also applies a yearly quota for foreign workers with permits to work in agriculture. Both the overall quota and the allocation of workers to individual farmers are strictly regulated.

Some commodities are supported by **guaranteed prices and production quotas**. Guaranteed prices for milk are based on the average cost of production and, while updated regularly, they diverge considerably from the level and evolution of prices on international markets. Minimum prices are also guaranteed for wheat, based on the Kansas market price, adjusted for quality and transportation costs. Egg production quotas and recommended prices are applied together with border protection as an instrument to provide price support to producers and are the basis for calculating maximum retail prices. On the other hand, consumer price controls are applied for a range of basic food products, including bread, milk and dairy products, eggs and salt. Egg and poultry producers in "peripheral areas" at the northern border receive

payments, based on output levels for eggs, and encompassing a mixture of payments decoupled from production and output payments for poultry producers (OECD, 2010[1]).

Capital grants provide support to investments. Farmers who participate in the **investment support** scheme also receive income tax exemptions and accelerated depreciation. Since 2009, an investment support programme was implemented to partly replace foreign workers in the agricultural sector, but budgetary allocations for this programme declined strongly in recent years.

The Insurance Fund for Natural Risks in Agriculture (*Kanat*) provides subsidised **insurance schemes**. The share of support in the total insurance premium is 80% in the case of the multi-risk insurance schemes and 35% in the case of the insurance schemes against natural hazards. Since 2010, revenue insurance is applied to rain-fed crops to protect against a loss of revenue caused by price falls, low yields or both.

In 2015, a **credit fund** launched with the goal of establishing or expanding small farms that specialise in crop production. The government serves as the guarantor for bank loans with an 85% guarantee to ensure that small farms with insufficient collateral can access loans.

Israel's economy is supported by a transparent and open **trade regime** overall. However, border tariff protection on agro-food products remains an important tool to support agricultural producers. Israel's average applied Most Favoured Nation (MFN) tariff on agricultural goods (WTO definition) amounted to 11.6% in 2020, down from 27.7% in 2012, still much higher than the 2% average for non-agricultural goods (WTO, 2018[2]; WTO, ITC and UNCTAD, 2021[3]). Israel has tariff rate quotas (TRQs) for wheat, fats and oils, walnuts, prunes, maize, citrus juices, beef and sheep meat, and various dairy products. Most of Israel's preferential trade agreements also include tariff-quota commitments for agricultural products, often with reduced out-of-quota tariffs. In total, Israel implements over 660 preferential TRQs for agricultural goods.[1]

Israel's **tariff profile** for agricultural products remains uneven, despite reforms that began in 2014. There are high – sometimes prohibitive – tariffs for goods such as dairy products, eggs, and certain fruits and vegetables, and low, sometimes zero, tariffs for other commodities such as specific coarse grains, sugar, oilseed and frozen beef. The tariff system on agriculture is complicated, involving specific, compound or mixed duties (WTO, 2018[2]); in 2020, 16.6% of imported agricultural products were subjected to non-ad-valorem rates, compared to 3.1% for all goods (WTO, ITC and UNCTAD, 2021[3]). At the same time, some 50.7% of agriculture imports entered Israel duty-free, mostly through MFN access and preferential agreements (notably with the European Union and the United States). With the exception of beef, poultry (including turkey), and mutton and products thereof, there is no legal requirement that imported food and agricultural products be kosher, although imported, non-kosher agro-food products are rarely accepted by local marketing chains.

Budgetary allocations for **research and development** regularly increase and account for over 20% of the total agriculture-related budget in recent years. During 2019-21, ILS 358 million (USD 105 million) was allocated annually to agriculture research and development, of which ILS 70 million (USD 21 million) was used for a competitive research fund. Together with effective transmission of innovation to the farm level through a public extension service, this allowed Israel to become a world leader in agricultural technology, particularly for farming in arid and desert conditions.

The government introduced and applied a number of programmes to support climate change adaptation. In addition to its forward-looking water resource management – in which irrigation relies on recycled wastewater and desalinated water, flexible quotas, and irrigation charges – the government supports research and development of improved agronomic practices, breeding, soil conservation and efficient use of resources. The programme also maintains the Israel Plant Gene Bank to conserve indigenous plant species. Efforts to develop a national quantitative assessment of climate change risks for agriculture are ongoing.

Climate change mitigation policies in agriculture

Israel has no sector-specific target for climate change mitigation in agriculture because agriculture accounts for a limited share of the country's total GHG emissions (2.6% in 2019)[2] Agriculture does not feature in Israel's Nationally Determined Contribution or national mitigation plan. Furthermore, GHG emission reduction potential in Israeli agriculture has not yet been quantified.

However, the government contributed to the development and supported the adoption of a number of agriculture practices and technical measures to reduce GHG emissions in addition to generating other environmental and economic benefits, such as:

- Conservation or regenerative agricultural practices, including minimum tillage, cover crops and the addition of organic matter to soils (compost and treated manure), supported through financial support, research and development and extension activities.
- Improving the use of nitrogen in soils by reducing the use of natural and synthetic fertilisers, treated wastewater, and soil amendments through R&D investments and extension activities.
- Improving the treatment of organic agricultural waste including manures, green waste, tree uprooting and animal mortality management through specific policies.
- Developing knowledge and know-how for climate-smart agriculture in view of achieving higher yields in a challenging climate, including via a more efficient use of water resources.
- Protecting trees and forests in rural and urban areas to sequester carbon, including perennial plants in agriculture.
- Facilitating the role of farming as a host for renewable energy production. Renewable energy production is largely supplied through generators located on agricultural lands; wind turbines are placed in fields, and solar panels are positioned on agricultural structures such as livestock barns and shelters. Israel started a multi-faceted pilot project to examine the benefits of dual agriculture-photovoltaic practices (also known as Agri-PV).

Although the GHG reduction potential of these measures remains unknown, the quantification of the benefits is important to put into place national emission reduction plans. The Ministry of Agriculture plans to conduct a study on the costs and benefits of various measures to reduce GHG emissions in agricultural production.

Domestic policy developments in 2021-22

Overall policy reforms

After four rounds of parliamentary elections in two years (April 2019 – March 2021) the new Israeli Government (established on 13 June 2021) passed the state budget for 2021 and 2022. Along with the budget, a new Arrangements Law was also passed.

On 1 August 2021, the new government introduced a major resolution to facilitate agriculture policy reforms, called Decision no. 213 "Increasing competition in agriculture and streamlining regulation processes in the field of imports". However, this decision was removed from the Arrangements Law and its implementation acts are still in discussion. Decision 213 aims to reduce customs on agricultural fresh produce and to ease import procedures. At the same time, the decision includes commitments for more innovation investments in agriculture and proposes a shift towards direct support to farmers. The Decision also creates the basis for an intergovernmental team aiming to analyse the supply chain of fruits and vegetables and to examine market barriers and failures, including marketing margins.

Sector specific reforms

Due to a significant scarcity of butter, custom duties on imported butter were temporarily lifted from March 2020 to the end of 2021. In December 2021, the Minister of Finance, in collaboration with the Minister of Agriculture, issued an order eliminating customs charges on butter to prevent shortages and help lower living expenses. The directive calls for the elimination of customs taxes on butter for consumers, as well as a temporary tariff exemption for butter destined for industrial uses until the end of 2022.

On 14 January 2021, after a long period of intensive negotiations, representatives of the Ministry of Finance, the Ministry of Agriculture and Rural Development (MARD) and producers signed the new **Dairy Agreement**, which sets out the policy for local production and import of dairy products to Israel for the coming years. Under this framework the target price mechanism remains unchanged for the next three years, after which the Ministers of Agriculture and Finance need to decide whether to extend the mechanism for another two years, until 2026. Imports of cheese, yoghurts and dairy desserts up to 5% fat content are exempted of customs, and the TRQ for yellow cheese will increase by 65% over the next 5 years.

Negotiations are ongoing on a far-reaching reform of the **egg sector**. The potential reform includes the elimination of the quota system, a decrease of custom duties, investment in new and larger hen houses, and compensation for chicken farmers leaving production. Egg production is planned to gradually move towards free-range hen houses. The reform includes an upgrading of the sector with regard to both sanitary conditions and animal welfare.

Preparation for the Jewish Shmita (Sabbatical) Year

Preparation for the Jewish Shmita (Sabbatical) Year concluded in the summer of 2021. The Hebrew year 5782 (September 2021 – September 2022) is a Sabbatical Year (*Shmita*), which is a Jewish traditional law occurring every seven years. It applies only to the biblical land of Israel and forbids the cultivation of agricultural land unless under specific circumstances. Almost 600 producer requests for non-cultivation were submitted during 2021 and an additional ILS 30 million (USD 9 million) was allocated. In total, about ILS 93 million (USD 29 million) will be dedicated to support farmers who choose not to cultivate their land during *Shmita*.

In addition, a total of ILS 7 million (USD 2 million) was approved (for 2021-22) for investments in new greenhouses in the non-Jewish sector to increase their production potential, and to support conversion to growth in soil-less beds and hydroponics (a “specific circumstance” that allows cultivation during the Sabbatical Year).

It should be noted that the majority of the more than 7 000 Israeli farmers act accordingly to the Jewish law solution of a sale permit. In the Sabbatical year the land “is sold” to whoever is not Jewish and thus it can be farmed in a similar way as a normal year. The Chief Rabbinate Office – a state institution – is handling the sale permits (contracts, legal fees etc) in the current Sabbatical Year at an estimated cost of ILS 8 million (USD 2.5 million).

Climate change adaptation and water management

Israel’s significant dependence on the wellbeing of the global and local food systems and the projected climate change impacts on regional food availability and food security raise the urgent need to integrate climate readiness in all areas of its food policy. To fulfil this purpose, an inter-ministerial committee led by the Ministry of Agriculture and Rural Development and the Ministry of Environmental Protection has been assembled. The committee will establish Israel’s vision, goals and objectives for Israel’s climate-ready and sustainable food system for 2030, and will promote integration of climate change assessment and adaptation actions in planning and policy.

Water allocations for most of the country in 2021 remained unchanged compared to 2020, though an additional allocation of 20 million cubic meters was provided to irrigators in the south via the national system. Contrary to forecasts, suggesting a 20% rain shortfall, total precipitation in 2021 reached its multi-annual average. The Sea of Galilee maintained its high water level and low salinity. However, water supply in northern rivers slightly decreased, as did the aquifers in the coastal plain. In the southern part of the country, the level of precipitation was below average, and accordingly water consumption from the national system in the area increased.

The forecast for 2022 remains stable with projections estimating total precipitation to be 100% of the multi-annual average. Water allocations for 2022 will be increased by 15 million cubic meters via the national system plus an addition of 10 million cubic meters for the *Shmita* year for farmers from the non-Jewish sector who will increase their production to compensate lower production from Jewish farmers choosing not to cultivate during this year (who keep their quotas to irrigate trees on their farms).

The work of connecting the Galilee and eastern valleys to the national system is progressing, as well as increasing the production from the Sorek Desalination Plant.

Water prices remained the same in 2021. According to the 2006 Farmers' agreement, the current outline ends in June 2022 and the price is expected to increase. A public hearing was held and discussions have been initiated regarding the planned price increase and compensations for farmers, but no agreement has been achieved yet.

Trade policy developments in 2021-22

The revised free trade agreement (FTA) with EFTA signed in 2018, the new FTA with Ukraine signed in 2019, and a United Kingdom–Israel Free Trade Agreement, as well as a protocol for the mutual recognition of organic produce, all entered into force in 2021. The new FTA with Korea was signed in May 2021, but has not yet been ratified. Negotiations on new FTAs with the People's Republic of China, Viet Nam, the Eurasian Economic Union, Guatemala, India and a new comprehensive economic partnership agreement (CEPA) with the United Arab Emirates are at varying stages of progress. A revised FTA with MERCOSUR is under negotiation.

Contextual information

Israel's economy is relatively small but has been growing rapidly and its GDP per capita more than doubled over the last two decades, even as the population increased by 50%. The share of agriculture in total employment and in GDP has fallen to around 1%. Israel is unique among developed countries in that land and water resources are nearly all state-owned. Jewish rural communities, principally the kibbutz and moshav, dominate agricultural production, accounting for about 80% of agricultural output. Partly due to this structure, total agricultural area has moderately increased over the past twenty years. While the agricultural sector is relatively diversified, most of the value of production and exports is generated by high value fruits and vegetables.

Table 16.3. Israel: Contextual indicators

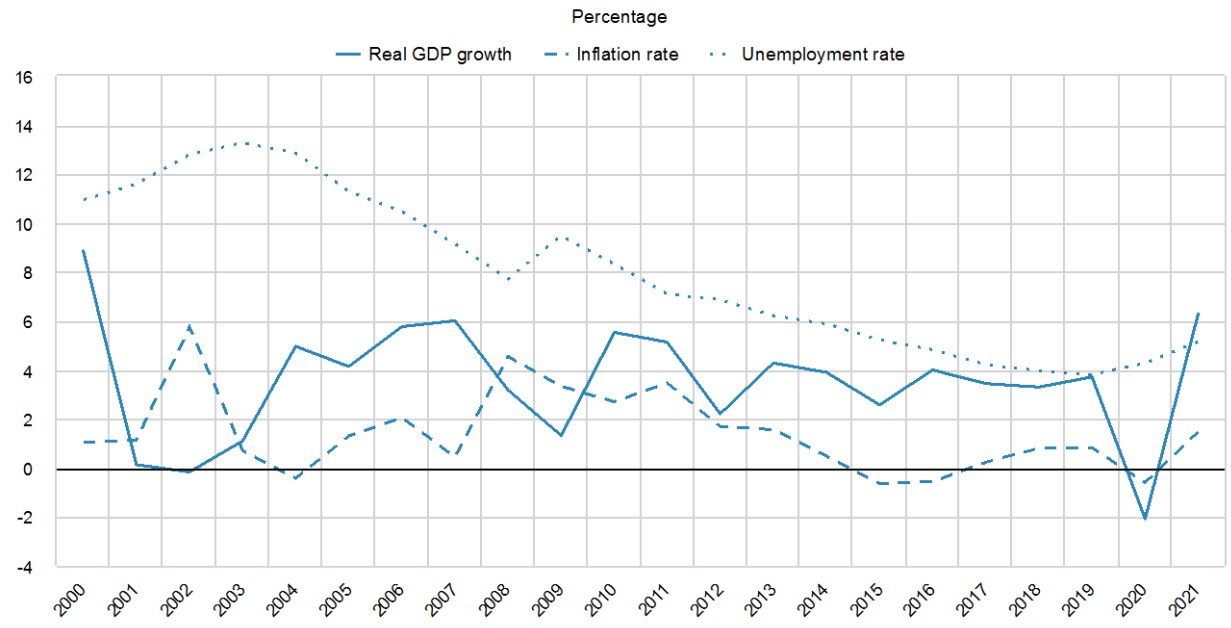
	Israel		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	157	391	0.39%	0.36%
Population (million)	6	9	0.15%	0.18%
Land area (thousand km^2)	22	22	0.03%	0.03%
Agricultural area (AA) (thousand ha)	566	638	0.02%	0.02%
			All countries[1]	
Population density (inhabitants/km^2)	290	422	53	63
GDP per capita (USD in PPPs)	24 893	42 403	9 281	20 929
Trade as % of GDP	25	15	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	1.5	1.3	2.9	4.9
Agriculture share in employment (%)	2.2	0.9	-	-
Agro-food exports (% of total exports)	3.1	4.4	6.2	8.5
Agro-food imports (% of total imports)	5.3	9.5	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	55	59	-	-
Livestock in total agricultural production (%)	45	41	-	-
Share of arable land in AA (%)	60	59	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Israel has maintained a highly-performing economy among OECD countries, with robust GDP growth exceeding 3% per year on average and close to full employment from 2017 to 2019. Its economy contracted in 2020 due to the COVID-19 pandemic and associated lockdown measures, but recovered quickly in 2021, while unemployment remained relatively low in 2020-21. At the same time inflation fluctuated around zero in the last five years (Figure 16.5)

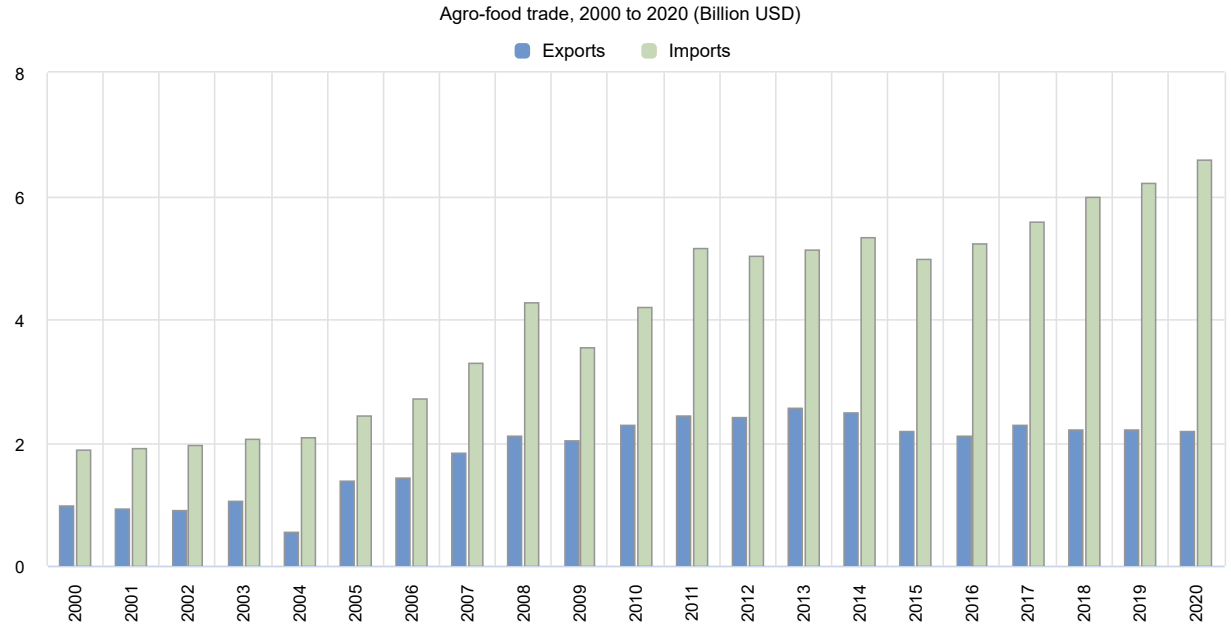
The agriculture trade balance of Israel continued to decline in 2020, with the value of imports of mostly processed food products exceeding the value of exports of mainly primary commodities (Figure 16.6). This gradual shift may be partly influenced by the relative appreciation of the Israeli currency compared to the US dollar and the Euro since 2015.

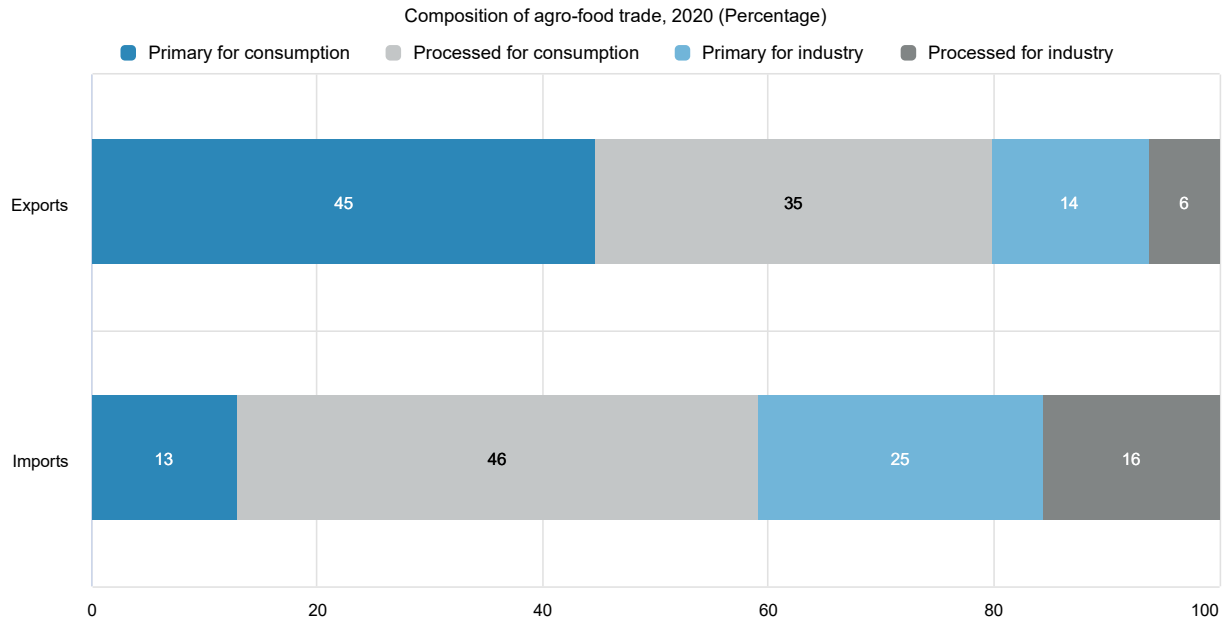
Figure 16.5. Israel: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 16.6. Israel: Agro-food trade



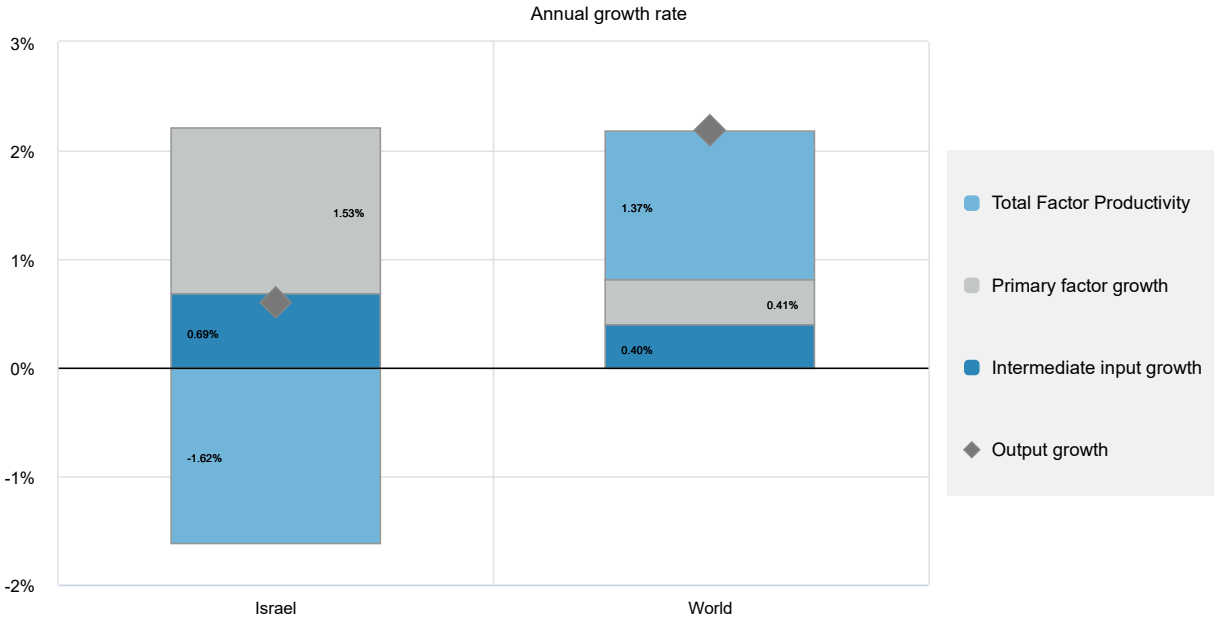


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

While agriculture research and development activities continue to be strong, the overall productivity of Israeli agriculture, measured by total factor productivity (TFP), has been declining since 2010-19. While agricultural output has increased, inputs, particularly land and the use of farm machinery, and intermediate inputs such as animal feed have increased faster over this period (Figure 16.7).

While agriculture's water use performance has largely improved, the environmental performance of Israel's agriculture has deteriorated since 2000. Despite a 75% increase in irrigation area, agriculture's share of freshwater abstraction has declined by 46%, largely due to changes in water management, encompassing the use of recycled water, efficient irrigation technologies and water demand policies. At the same time, nutrient surpluses have grown over time, particularly due to the increase in the use of fertilisers, to reach a level over seven times the OECD average levels for nitrogen and over twenty times for phosphorus (Table 16.4).

Figure 16.7. Israel: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 16.4. Israel: Productivity and environmental indicators

	Israel		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	2.6%	-1.6%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	188.8	224.4	32.1	30.0
Phosphorus balance, kg/ha	65.7	69.9	3.4	2.9
Agriculture share of total energy use (%)	1.2	1.6	1.7	2.0
Agriculture share of GHG emissions (%)	3.3	2.8	8.6	9.7
Share of irrigated land in AA (%)	43.4	67.3	-	-
Share of agriculture in water abstractions (%)[1]	64.0	35.0	46.3	43.7
Water stress indicator	61.0	39.3	9.7	8.6

Note: * or closest available year.
1. Share of agriculture fresh water abstraction in total fresh water abstraction.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

As noted above, GHG emissions remain close to 3% of total emissions. GHG emissions from agriculture are routinely assessed as part of Israel's national emission reporting to the UNFCCC based on IPCC methodology. Over the past decade, Israel has reported annual emissions of nitrous oxide (N_2O) and methane (CH_4) amounting from agricultural activities – enteric fermentation, manure management and agricultural soils. Israel's agriculture accounts for 10.8% of national methane emissions, 58.5% of national nitrous oxide emissions, and all in all 2.6% of greenhouse gas emissions in CO_2-equivalent (Table 16.5).

Carbon dioxide (CO_2) emissions from burning of fuels in agriculture are attributed to the energy sector, but the proportion of agriculture in these emissions is small.

Table 16.5. Israel: GHG emissions from agriculture 2011-2019

Unless specified, the estimates are in thousand tonnes

Process	Enteric fermentation	Manure management		Agricultural soils	Total agricultural emissions		
Greenhouse gas	CH_4	CH_4	N_2O	N_2O	CH_4	N_2O	Total CO_2eq
average 2012-2018	36.6	2.9	0.6	3.4	39.6	4.0	2 076.4
SD 2012-2018	1.4	0.1	0.03	0.2	1.4	0.2	93.5
% National emissions	10.8	0.9	8.8	49.6	11.7	58.5	2.6

Source: Derived from the Israel Central Bureau for Statistics.

References

OECD (2010), *OECD Review of Agricultural Policies: Israel 2010*, OECD Review of Agricultural Policies, OECD Publishing, Paris, https://doi.org/10.1787/9789264079397-en. [1]

WTO (2018), *"Trade Policy Review: Israel", Secretariat Report, World Trade Organization, Geneva*. [2]

WTO, ITC and UNCTAD (2021), *World Tariff Profiles 2021*, WTO, ITC, UNCTAD, Geneva, https://www.wto.org/english/res_e/booksp_e/tariff_profiles21_e.pdf. [3]

Notes

[1] Including the Ukrainian, UK and EFTA's TRQs approved as part of their respective FTAs with Israel, which entered into force in 2021.

[2] More information on GHG emissions is in the section on Contextual information.

17 Japan

Support to agriculture

Japan gradually reduced its support to agriculture during the last ten years, but the level of support plateaued more recently. Support to producers (PSE) as a share of gross farm receipts (41% in 2019-21) remains more than twice the OECD average. The total support estimate to agriculture (TSE) represented 0.9% of Japan's GDP in 2019-21, most of which was direct support to producers.

Market price support (MPS) remains the main element of Japan's agriculture support due to high border measures, particularly for rice, pork and milk. Consequently, average producer prices overall are still 60% higher than world reference prices. The share of potentially most-distorting support (MPS, support based on output and variable input use without input constraint) declined but still accounts for 84% of PSE in 2019-21. Budgetary support to producers is mostly payments based on area and income.

Expenditures for general services (GSSE) are 22% of Japan's total support to the sector. Compared to the size of the sector, GSSE corresponds to almost 13% of the agricultural value of production, higher than the OECD average but less than in the 1990s. Over 80% of the GSSE goes to the development and maintenance of agricultural infrastructure, irrigation in particular, while 10% goes to financing the agricultural knowledge and innovation system.

Recent policy changes

In May 2021, Ministry of Agriculture, Forestry and Fisheries (MAFF) released the Strategy for Sustainable Food Systems, called MeaDRI (Measures for Achievement of Decarbonisation and Resilience with Innovation), a strategy to transform Japan's food systems and increase sustainability and productivity by 2050 by enhancing engagement of stakeholders at each stage of food supply chains, and promoting innovation to reduce environmental load. The strategy includes 14 Key Performance Indicators (KPIs) and a road map for developing and implementing innovative technologies and production methods by 2050. The agriculture-related KPIs include targets for the reduction of chemical fertiliser and pesticide applications as well as for increasing land under organic farming.

In October 2021, Japan set a Nationally Determined Contribution (NDC) target of reducing greenhouse gas (GHG) emissions by at least 46% relative to 2013 levels by 2030, with the long-term goal of achieving net-zero by 2050. In line with the MeaDRI, MAFF revised the 2017 climate change mitigation plan for the agriculture, forestry and fisheries sectors, and raised the emission mitigation target from a total of 38.8 $MtCO_2eq$ to 49.5 $MtCO_2eq$ by 2030. This accounts for 3.5% of the reduction pledge made in the NDC. In the mitigation plan, forest land plays a significant role as a carbon sink to meet the GHG reduction targets, while various payments and credits schemes are being implemented to incentivise GHG emission reductions in agricultural production.

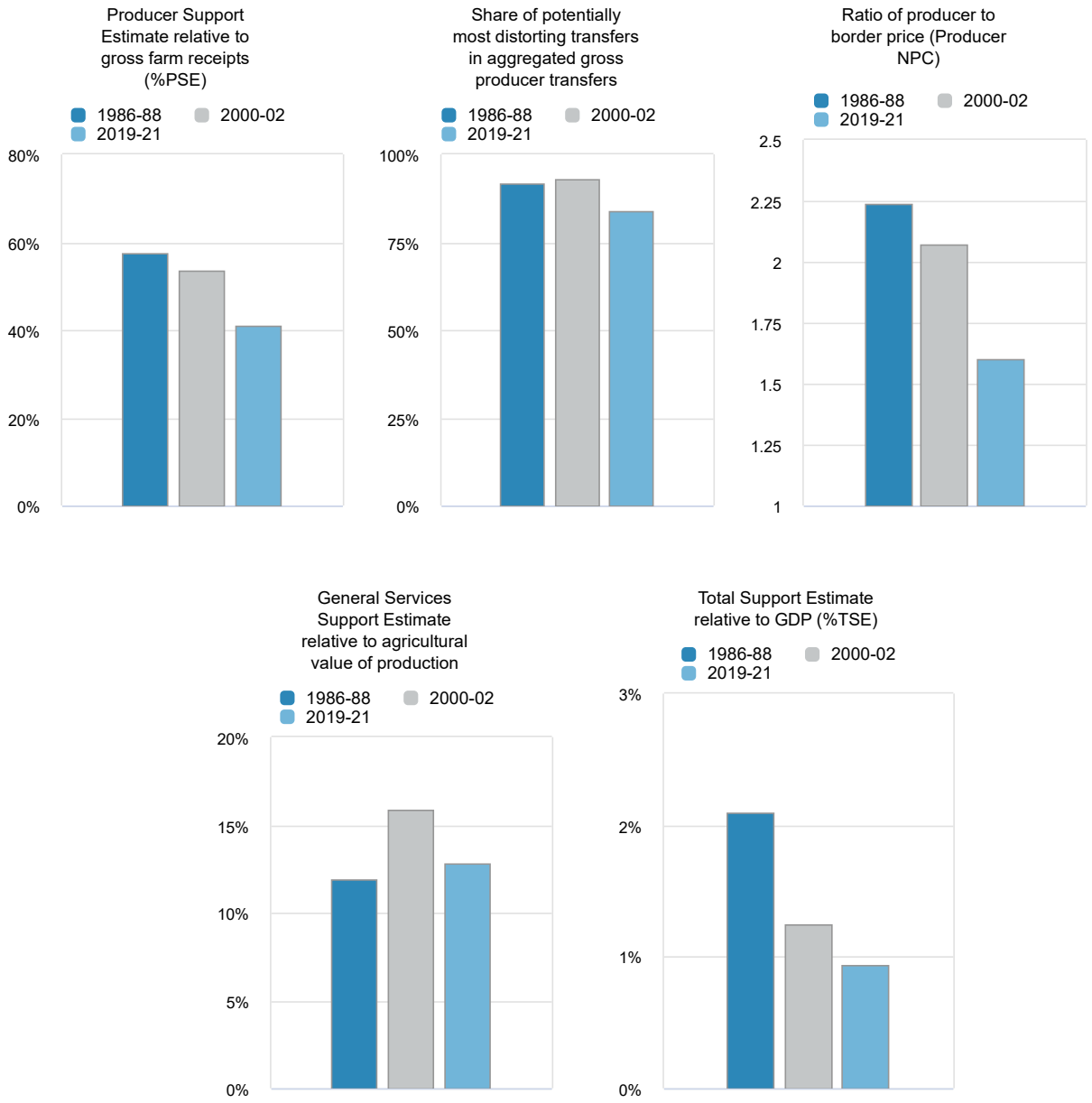
The Regional Comprehensive Economic Partnership (RCEP) with 14 countries in the Asia-Pacific region entered into force in January 2022. RCEP is the first Economic Partnership Agreement (EPA) that Japan has with the People's Republic of China (hereafter "China") and Korea. Japan eliminated tariffs on 56% of

agricultural imports from China, 49% from Korea, and 61% from ASEAN, Australia and New Zealand. Sensitive agricultural products such as rice, wheat, beef, pork, dairy products, and sugar and starch are exempt from tariff reductions.

Assessment and recommendations

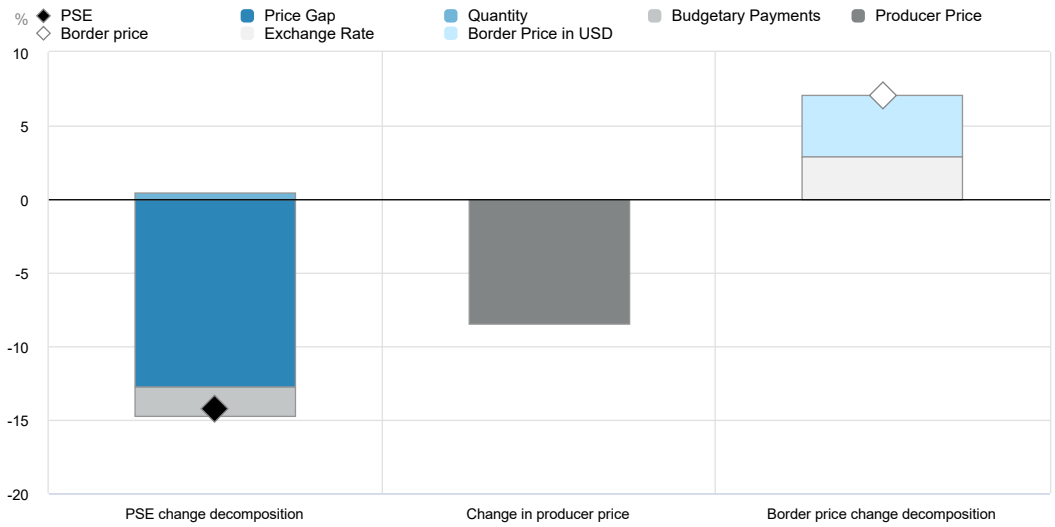
- Japan's share of GHG emissions from agriculture relative to total emissions is the lowest among OECD countries. However, the agricultural sector is responsible for nearly 80% of total methane (CH_4) emissions, mainly due to rice cultivation and livestock enteric fermentation. Thus, policies seeking to minimise CH_4 emissions from rice paddy fields and livestock production will be particularly effective in reducing GHG emissions originating from the agricultural sector.
- Japan has made progress in reforming agricultural support policies since the early 2000s, but support to producers remains more than twice the OECD average and continues to be dominated by MPS, which distorts markets. Further improvements should be envisaged to reduce MPS and eliminate measures impeding market signals.
- The annual value of agriculture, food, forestry and fishery exports continued to increase in recent years. While this signals a move towards a more market-oriented agricultural sector, the exclusion of key products from trade agreements, including RCEP, limits the economic gains of opening the country to international trade. A gradual reduction of trade barriers on agricultural products would contribute to structural change and further productivity growth in the Japanese agri-food sector.
- Japan's new systemic approach, MeaDRI, is a promising sector-wide initiative to increase the sustainability and productivity of its food systems, but will require complementary measures to be effective.
- MeaDRI's 14 KPIs and the road map for sustainable transition to enhance engagement of stakeholders in food supply chains are welcome initiatives. The government should improve or develop policies to incentivise farmers and other stakeholders to take up innovative technologies and production methods through R&D, networking, capacity-building, strategic advice and multi-actor partnerships.
- MeaDRI prioritises R&D in new technologies to reduce environmental impact and enhance agricultural productivity. Skills development and knowledge transfer should be reinforced to reap the benefits of technological innovations. Agricultural education, training and extension systems should also improve to upgrade famers' skills and knowledge concurrently with technology and industry developments.

Figure 17.1. Japan: Development of support to agriculture



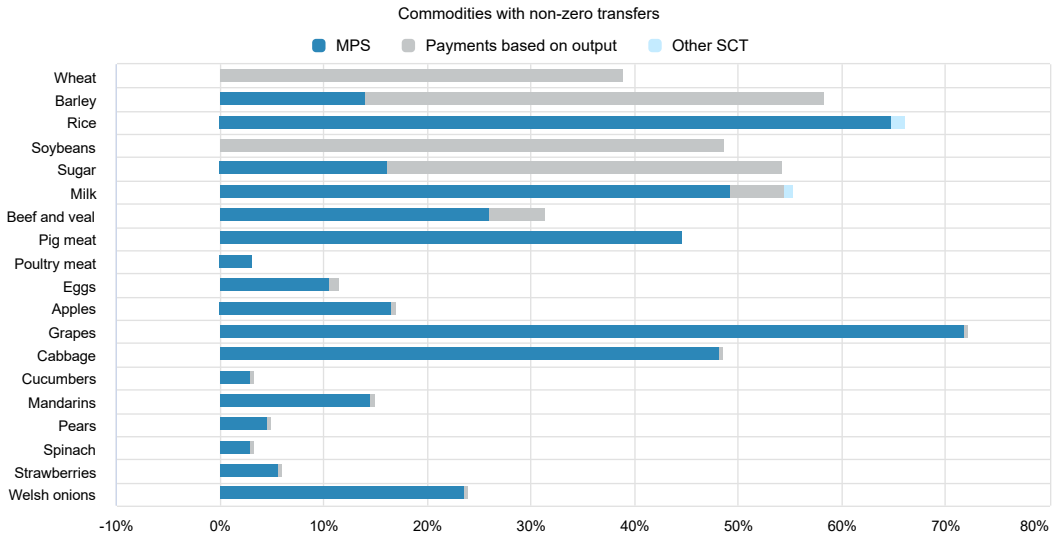
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 17.2. Japan: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 17.3. Japan: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 17.1. Japan: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**72 767**	**76 354**	**82 291**	**81 560**	**83 675**	**81 638**
***of which:** share of MPS commodities (%)*	68.36	63.81	67.80	67.97	67.84	67.59
Total value of consumption (at farm gate)	**94 458**	**107 904**	**117 593**	**119 286**	**120 541**	**112 952**
Producer Support Estimate (PSE)	**44 611**	**43 955**	**37 070**	**37 245**	**40 331**	**33 634**
Support based on commodity output	40 996	40 828	31 016	31 669	33 681	27 698
Market Price Support[1]	39 458	38 471	28 963	29 987	31 281	25 622
Positive Market Price Support	39 458	38 471	28 963	29 987	31 281	25 622
Negative Market Price Support	0	0	0	0	0	0
Payments based on output	1 539	2 358	2 053	1 682	2 399	2 077
Payments based on input use	1 434	976	877	949	1 000	681
Based on variable input use	403	85	9	10	8	9
with input constraints	403	85	0	0	0	0
Based on fixed capital formation	890	724	597	656	732	404
with input constraints	403	85	0	0	0	0
Based on on-farm services	142	167	270	284	260	268
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	621	613	2 211	1 875	2 825	1 933
Based on Receipts / Income	0	0	194	222	183	178
Based on Area planted / Animal numbers	621	613	2 017	1 653	2 642	1 755
with input constraints	0	0	1 555	1 194	2 172	1 299
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	1 560	1 538	2 967	2 752	2 826	3 322
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	1 560	1 538	2 967	2 752	2 826	3 322
with commodity exceptions	1 560	1 257	2 729	2 515	2 588	3 084
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**57.42**	**53.61**	**40.98**	**41.93**	**43.50**	**37.52**
Producer NPC (coeff.)	**2.24**	**2.07**	**1.60**	**1.64**	**1.66**	**1.52**
Producer NAC (coeff.)	**2.35**	**2.16**	**1.69**	**1.72**	**1.77**	**1.60**
General Services Support Estimate (GSSE)	**8 769**	**12 141**	**10 581**	**10 410**	**12 592**	**8 740**
Agricultural knowledge and innovation system	514	861	1 030	1 075	1 060	954
Inspection and control	55	66	110	89	119	121
Development and maintenance of infrastructure	7 747	10 620	8 749	9 040	10 418	6 790
Marketing and promotion	152	248	568	90	869	745
Cost of public stockholding	301	345	124	116	126	130
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**16.29**	**21.66**	**22.19**	**21.84**	**23.79**	**20.62**
Consumer Support Estimate (CSE)	**-53 525**	**-49 474**	**-41 309**	**-43 115**	**-43 692**	**-37 120**
Transfers to producers from consumers	-38 964	-38 460	-29 468	-30 627	-31 417	-26 360
Other transfers from consumers	-14 520	-11 100	-12 429	-13 056	-12 826	-11 407
Transfers to consumers from taxpayers	-108	35	6	6	6	6
Excess feed cost	68	51	583	562	546	640
Percentage CSE (%)	**-56.73**	**-45.81**	**-35.12**	**-36.15**	**-36.25**	**-32.87**
Consumer NPC (coeff.)	**2.31**	**1.85**	**1.55**	**1.58**	**1.58**	**1.50**
Consumer NAC (coeff.)	**2.31**	**1.85**	**1.54**	**1.57**	**1.57**	**1.49**
Total Support Estimate (TSE)	**53 272**	**56 130**	**47 657**	**47 660**	**52 929**	**42 381**
Transfers from consumers	53 485	49 559	41 898	43 683	44 243	37 767
Transfers from taxpayers	14 308	17 670	18 189	17 033	21 512	16 020
Budget revenues	-14 520	-11 100	-12 429	-13 056	-12 826	-11 407
Percentage TSE (% of GDP)	**2.10**	**1.24**	**0.94**	**0.93**	**1.05**	**0.85**
Total Budgetary Support Estimate (TBSE)	**13 814**	**17 659**	**18 693**	**17 673**	**21 647**	**16 759**
Percentage TBSE (% of GDP)	**0.54**	**0.39**	**0.37**	**0.34**	**0.43**	**0.34**
GDP deflator (1986-88=100)	**100**	**105**	**97**	**97**	**98**	**97**
Exchange rate (national currency per USD)	**147.09**	**118.19**	**108.52**	**109.05**	**106.76**	**109.77**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Japan are: wheat, barley, soybean, rice, sugar, milk, beef and veal, pig meat, poultry, eggs, apples, cabbage, cucumbers, grapes, mandarins, pears, spinach, strawberries and Welsh onions.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Agricultural land reform was implemented immediately after World War II, transferring farmland ownership from landlords to previously tenanted farmers in order to improve their economic and social position. It restricted sales of farmland to non-farmers and strongly protected farmers' rights. This policy applied until 2009, when the Agricultural Land Act was revised to allow non-agricultural companies to lease farmland. Japan also invested in agricultural research, extension services, and land infrastructure to recover from the devastation of the war. At the same time, the government kept controls on rice procurement – from production to distribution to consumers – under the Food Management Law in order to secure food supply.

To address the rising disparity in living standards and productivity between agriculture and other sectors, Japan implemented the Agricultural Basic Act in 1961 to increase farmers' incomes by promoting the modernisation of agriculture. From the mid-1950s to the mid-1990s, agricultural policies focused on price and marketing control, including tariffs for key products, particularly rice, to ensure affordable food prices for consumers while increasing farm income in rural areas.

In 1993, at the conclusion of the Uruguay Round trade negotiations, Japan agreed to a preferential quota on rice imports. The Food Management Law was repealed in 1995, introducing market mechanisms to rice distribution. Following the replacement of the GATT with the WTO in 1999, Japan converted non-tariff border measures to tariff rate quotas (TRQs) for major commodities, including rice.

Rapid globalisation of the economy, together with the continued decline in farming population and farmland area adversely impacted Japanese farming communities. In response, the Agricultural Basic Act was replaced by the Food, Agriculture and Rural Areas Basic Act in 1999 to establish four basic principles: (1) a stable food supply; (2) the desired multifunctional roles of agriculture; (3) sustainable development of agriculture; and (4) development of rural areas. Under the act, ten-year agricultural policy plans, named the Basic Plan for Food, Agriculture and Rural Areas, have been formulated since 2000.

Recent agricultural policy reforms were aimed at helping the sector become more competitive and resilient. These reforms involved the promotion of farmland consolidation and the re-organisation of agricultural co-operatives. Japan also introduced the revenue insurance programme to diversify farmers' risk-management tools. Moreover, Japan abolished the government-administered rice production quota system in 2018. Further, to capture increasing demand for Japanese food products overseas, agricultural and food exports became a key policy goal. In 2021, to increase the sustainability and production potential of Japan's food systems, the "Measures for Achievement of Decarbonisation and Resilience with Innovation (MeaDRI)" Strategy was developed. MeaDRI is a sector-wide initiative to improve environmental, social, and economic outcomes throughout supply chains by 2050.

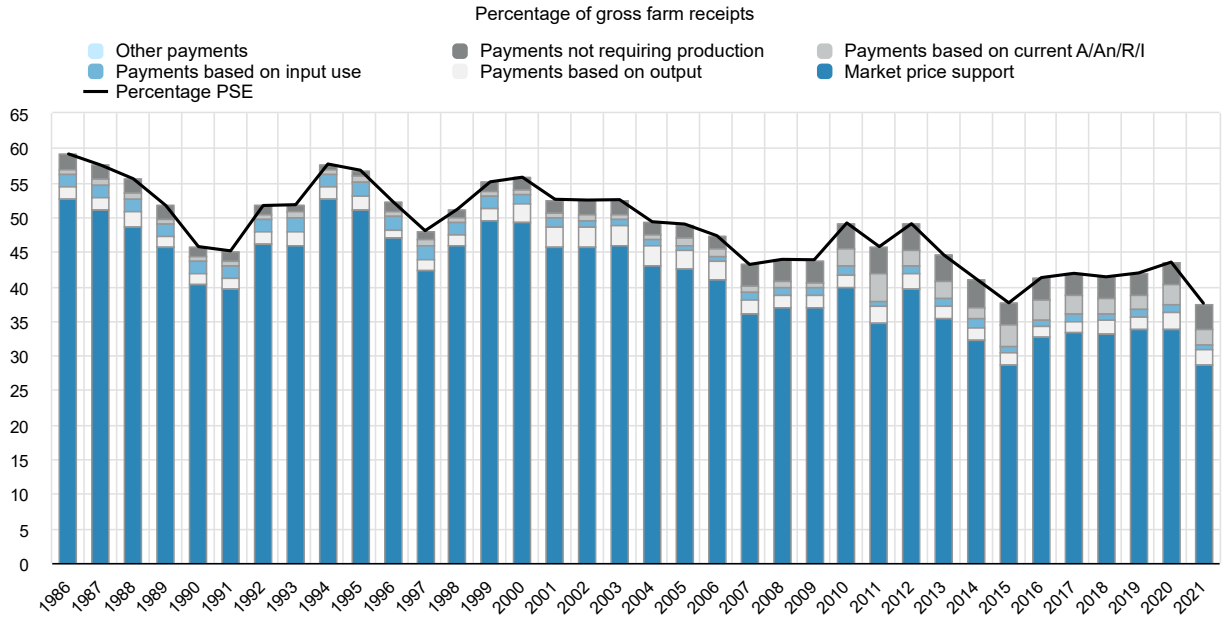
In parallel, Japan improved market access through large-scale trade agreements in recent years, including the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in 2018, the Japan-EU Economic Partnership Agreement (Japan-EU EPA) in 2019, the Japan-US Trade Agreement in 2020, and the Regional Comprehensive Economic Partnership (RCEP) in 2022.

Table 17.2. Japan: Agricultural policy trends

Period	Policy directives	Changes in agricultural policies
Prior to1960	Eradication of rural poverty and securing food supply	Agricultural land reform implemented to help farmers own farmland Arrangements to increase food production (Agricultural Co-operatives Act of 1947, Agricultural Disaster Compensation Act of 1947, Agricultural Land Act of 1957) Policy priority given to increasing rice production to solve serious food shortage (Food Management Law of 1942, Five Year Food Production Increase Plan of 1952)
1960-1980	Reduction of income disparities between agriculture and other industries	Basic Agricultural Act (1961) to increase farmers' income by increasing farm size, improving farmland, adopting agricultural machinery and technology and shifting from rice and wheat-based production to livestock, vegetables and fruits. Rice policy goal changed from increasing rice production to managing quantity as full self-sufficiency achieved in 1967 Rice production adjustment control introduced in 1971
1980-2010	Adjusting towards internationalisation, bringing market principles to the agricultural sector, and integrating concepts of 'rural area' and 'food' into agricultural policies	Agricultural Management Framework Reinforcement Act (1993) systematises support for qualified farmers Act on Stabilization of Supply, Demand and Prices of Staple Food (1994) changes the role of government in rice state trading; government only purchases for stockpiling purposes Quantitative quotas of rice replaced by tariff rate quota (1999) Act on Food, Agriculture and Rural Areas (1999) aims to establish stable agricultural structure in the new economic and social conditions; food self-sufficiency goal and direct payments for farmers in mountainous areas introduced
2010-Present	New agricultural reforms to enhance competitiveness and resilience	Farmland reforms (2009 revision of Agricultural Land Act to allow leases, 2013 Act on Promotion of Agricultural Land Intermediary Management to facilitate agricultural land consolidation) Amendment of Agricultural Co-operatives Act (2015) Abolition of rice production quota system (2018) Introduction of the revenue insurance programme (2019) Large-scale trade agreements (CPTPP, Japan-EU EPA, Japan-US Trade Agreement, RCEP) and export promotion of agricultural and food products Formation of MeaDRI strategy with sustainability and food related goals (2021)

Support to farmers declined from close to 57% of gross farm receipts in the mid-1980s to less than 38% in 2015, but stabilised around 41% in recent years. The share of market price support also declined but, while Japan provides a range of budgetary forms of producer support, higher domestic prices continue to provide the majority of transfers to producers, accounting for close to 80% of PSE in 2019-21 (Figure 17.4).

Figure 17.4. Japan: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Basic Plan for Food, Agriculture and Rural Areas revised in 2020 (hereafter the 2020 Basic Plan) sets Japan's agricultural policy direction for the next decade. The Basic Plan aims to continue necessary agricultural policy reforms both to make the sector competitive and manage issues facing the sector, while putting an increased emphasis on rural communities, smart agriculture and digitalisation, and risk management (e.g. with respect to natural disasters). The Basic Plan also aims to ensure a stable food supply and improved food self-sufficiency.

Japan maintains a system of high border protection and domestic price support for key agricultural products. On average, tariffs on agricultural products amounted to 15.8% in 2020, compared to 2.5% for non-agricultural products. However, agricultural tariffs vary considerably, with over 35.7% of tariff lines duty-free and 3% of them above 100% (ad valorem equivalent), while 13.3% of agricultural tariff lines have non-ad valorem tariffs (WTO, 2021[1]). **Tariff rate quotas** with high out-of-quota tariffs apply to some commodities, like starch and dairy products.

Rice import happens through **state trading**, fulfilling Japan's minimum-access commitment under the WTO Agreement on Agriculture. A TRQ of 682 200 tonnes (milled) applies. The maximum **mark-up** (collected by the government when importing and selling on domestic markets) for rice imports is set at JPY 292 (USD 2.7) per kg, and the out-of-quota tariff-rate is JPY 341 (USD 3.1) per kg.

A **revenue-based payment** is available for farmers meeting certain requirements and producing rice, wheat, barley, soybean, sugar beet and starch potato, if revenues from these crops drop below historic

average revenues. Ninety per cent of the difference between current revenue and the past average is compensated by the government (75%) and the farmers' reserve fund (25%).

The **direct support payment** for upland crops (wheat, barley, soybean, sugar beet, starch potato, buckwheat and rapeseed) is based on the combination of area and output. The government provides area payments based on current planting, and output-based payments according to the volume of sales and the quality.

A **crop diversification payment** goes to farmers who switch their use of paddy fields from table rice production to other crops (wheat, soybeans, or rice for feed and processing). This payment is area-based, but output is also taken into account for rice for feed and flour. Within this crop diversification programme, a payment is also provided to municipal governments if the production area employs high-yield rice variety for feed and processing, or cultivates buckwheat or rapeseed.

The **Livestock Stabilisation Programme**, known as Marukin, provides support payments to beef cattle and hog producers when the average sales price falls below the average production cost. Ninety per cent of the difference between costs and sales prices are paid to producers, to which the government contributes 75% and the rest are provided by the producers' reserve fund. Output-based compensation also goes to producers of raw milk used for dairy processing.

Commodity insurance is voluntary and available for a range of commodities (rice, wheat, barley, livestock, fruit and field crops) and horticultural facilities. It covers yield losses and damage to facilities from pests and natural disasters. Degradation of crop quality is also insured for rice, wheat, barley and fruit. Government support covers around 50% of the insurance premium. In 2019, Japan launched **the revenue insurance programme** to provide a safety net for farmers in case of revenue loss. The programme compensates the loss of farm revenue stemming from both market and natural causes, relative to a benchmark based on the previous five years' revenues. The government supports 50% of the insurance premium and 75% of the reserve fund. Farmers can participate in either commodity insurance or revenue insurance programme to avoid duplicate payments.

Japan provides financial support to **young farmers** (under 50 years old) during a training period (maximum of two years) and during the initial operation period (maximum of five years). Other annual subsidies are available for agricultural co-operation to compensate the training cost of young farmers.

The Agricultural Land Act establishes **Agricultural Committees** in municipalities to manage agricultural land use. Purchasing, selling and leasing of agricultural land need to be approved by the Committee. In 2014, **Farmland Banks**[1] were established in all prefectures to reinforce the intermediary role of the government in land transactions. The banks improve farmland conditions and infrastructure (e.g. expansion of plot size and investment in drainage facilities) if necessary, and then lease the consolidated farmland to business farmers. Subsidies are provided to landowners and regional authorities that lease farmland to the banks.

Public investment in **rural and agricultural infrastructure** is a core agricultural policy, including farmland, agricultural roads, dams and irrigation, and drainage facilities. The government also invests in the prevention of natural disaster and restoration of farm infrastructure, and in construction of public health and recreational facilities associated with agriculture.

Hilly and mountainous areas represent about 40% of both total agricultural land and total agricultural output in Japan. Area-based direct payments go to farmers in these areas to compensate for the physical disadvantage imposed on agricultural production, and thus to avert the abandonment of agricultural land. Other payments are available to support collective engagement of local stakeholders in maintaining **the multifunctional roles of agriculture**. Direct payments for **environmentally friendly agriculture** are provided to farmers who conduct activities effective in preventing global warming or conserving biodiversity.

Japan currently has 20 **Economic Partnership Agreements (EPAs)** and other trade agreements in force with Singapore, Mexico, Malaysia, Chile, Thailand, Indonesia, Brunei Darussalam, the Association of Southeast Asian Nations (ASEAN), Philippines, Switzerland, Viet Nam, India, Peru, Australia, Mongolia, CPTPP, the European Union, the United States, the United Kingdom and RCEP. In addition, Japan is engaged in EPA negotiations with Colombia and Turkey, and China and Korea for the plurilateral free trade agreement.

Climate change mitigation policies in agriculture

In 2019, total emissions from agricultural in Japan amounted to 31.7 $MtCO_2eq$, accounting for 2.6% of Japan's total emission (Greenhouse Gas Inventory Office of Japan, 2021[2]). The land use, land use change and forestry (LULUCF) sector was a net sink of -50.1 $MtCO_2eq$ in 2019. Forested land was a large net sink and captured -55.1 $MtCO_2eq$ in 2019, while grasslands and croplands emitted about 1.0 and 5.2 $MtCO_2eq$, respectively.

In its Nationally Determined Contribution submitted to the UNFCCC in October 2021, Japan committed to an economy-wide reduction in GHG emissions of at least 46% relative to 2013 levels by 2030, an ambitious target aligned with the long-term goal of achieving net-zero by 2050. All UNFCCC national inventory sectors are covered by this commitment, including the agriculture and LULUCF sectors, although sector-specific targets are not given.

Under the Measures for Achievement of Decarbonisation and Resilience with Innovation (MeaDRI) adopted in 2021 (see below), MAFF set several targets linked with GHG mitigation. These include reductions in carbon dioxide emissions, and in chemical fertiliser and pesticide applications.

In line with the MeaDRI, MAFF revised the 2017 climate change mitigation plan[2] for the agriculture, forestry and fisheries sectors and raised the emissions reduction target from 38.8 $MtCO_2eq$ to 49.5 $MtCO_2eq$ by 2030. The new target represents a higher share of the emissions reductions pledged in the NDC, 3.5% compared to 2.8%.

In the revised mitigation plan, LULUCF plays a significant role as a carbon sink to meet the GHG reduction targets. MAFF is taking action to sequester 38 $MtCO_2eq$ in forest sinks while supporting cropland and grassland management (e.g. application of compost and green manure, and use of biochar) to sequester 8.5 $MtCO_2eq$ above 2013 levels. In total, the expected removal of carbon from the atmosphere accounts for 94% of 2030 GHG reduction targets (46.5 $MtCO_2eq$).

Besides sequestration strategies, the mitigation plan also aims to reduce GHG emissions from agricultural and fishery production up to an additional 3 $MtCO_2eq$ beyond 2013 levels by 2030. These reductions are set to come from improved energy efficiency in horticultural greenhouses (1.5 $MtCO_2eq$), reduced emissions from agricultural machinery (7 900 tCO_2eq) and reduced N_2O from crop production (0.2 $MtCO_2eq$). Reduction of CH_4 emission from rice cultivation is accounted for 1.0 $MtCO_2eq$ through, for example, extending the period of mid-season-drainage in paddy fields.

GHG mitigation efforts in agriculture are conducted mostly via support payments, grants or credits. For instance, direct payments for environmentally friendly agriculture are provided to farmers who conduct GHG mitigation activities, such as applying compost and extending the period of mid-season-drainage. These activities must be in conjunction with reducing the use of synthetic fertilisers and pesticides by more than half relative to conventional farming practices in the region. The government provides investment support for farmers to introduce climate-smart technologies such as renewable energy and biomass-based greenhouse heating systems in horticulture.

In the livestock sector, dairy farmers with more than a certain size farmland for feed production (0.4 ha/dairy cow in Hokkaido and 0.1 ha/dairy cow in other regions) and who conduct environmentally-friendly practices (e.g. no tillage, chemical fertiliser and pesticide application reductions) can receive area-based payments.

Livestock farmers can receive support to invest in green infrastructure, such as biogas plants and composting facilities for better manure management and clean energy production.

The J-Credit scheme was implemented in April 2013 as a carbon credit certification for domestic activities. Under the scheme, the government certifies and grants a credit for the GHG emissions reduced through energy-saving technologies and sequestered through forest management. The credit can be sold to companies, event organisers and other entities to utilise for offsetting. As of January 2022, 387 projects were registered, with expected emission reductions or avoidance totalling 15.3 $MtCO_2eq$. Among these, 107 projects (accounting for 1.5 MtCO2eq) were from the agriculture, forestry and fisheries sectors.

Research and development (R&D) and knowledge transfer programmes complement these mitigation efforts. R&D and knowledge transfers are a high priority to achieve the MeaDRI long-term goals of net-zero carbon emissions while maintaining productivity, as explained in the next section.

Domestic policy developments in 2021-22

Food systems sustainability

MAFF released the Strategy for Sustainable Food Systems, **MeaDRI**, in May 2021. The MeaDRI is a 2050 strategy to transform Japan's food systems and increase both sustainability and productivity potential by (1) enhancing engagement of stakeholders at each stage of food supply chains, and (2) promoting innovation to reduce environmental load. The strategy is based on policy discussions with multiple agricultural stakeholders. MAFF promotes this strategy as a new initiative model for sustainable food systems in the Asia Monsoon region which is characterised by hot and humid climate and paddy field farming.

The strategy includes **14 Key Performance Indicators (KPIs)** and a road map for developing and implementing innovative technologies and production methods by 2050. The agriculture-related KPIs include:

- Zero CO_2 emission from fossil fuel combustion in agriculture, forestry and fisheries
- 50% reduction risk-weighted use of chemical pesticides[3] by dissemination of the Integrated Pest Management and newly-developed alternatives
- 30% reduction in chemical fertiliser use
- Increase of land under organic farming to 1 Mha (equivalent to 25% of farmland)[4]
- At least 30% enhancement in productivity of food manufacturers (by 2030)
- Sustainable sourcing for import materials (by 2030)

MAFF allocated JPY 2.5 billion (USD 22.8 million) of the 2021 budget to MeaDRI measures, with a plan of an increased budget in 2022 linked to more enhanced conditionality in relation to environmental and climate objectives. The measures include a new R&D and demonstration programme, supporting two main objectives: (1) accelerating the development and the implementation of Smart Agriculture[5] and (2) promoting the R&D of innovative technologies by scaling up competitive research funds. Second, they support activities at local level or in food supply chain networks, where multiple actors collaborate to facilitate the transition to sustainable food production and distribution. For instance, a new subsidy supports municipalities to promote organic agriculture in various ways. Third, the government also offers support for the training of local action groups, consisting of multiple actors (e.g. extension services, farmers, companies of fertilisers, pesticides and machinery vendors, ICT vendors, and farm co-operatives), that will jointly engage in dissemination of green practices.

Innovation and digitalisation

Accelerating the implementation of **Smart Agriculture** and digitalisation is one of the key visions within the 2020 Basic Plan. The October 2020 Smart Agriculture Comprehensive Policy Package was revised in February 2021. The document identifies the necessary measures to reach the goal of having "most of key agricultural producers in Japan practice data-driven agriculture by 2025." The measures range from conducting pilot studies to providing training opportunities.

In November 2021, the Prime Minister led the first meeting of the Council for the **Digital Denen-Toshi Vision.**[6] The focus of the vision is to use increased digitalisation to revitalise rural economy while enjoying the benefits of rural living such as well-being and sustainability. To accelerate digitalisation, a five-year action plan to train 2.3 million digital professionals was announced in December 2021. In the agricultural sector, professional training to acquire new IT and digital skills in smart agriculture is to be provided to 30 000 people per year in agricultural schools.

Rural development

One of the key policy objectives for Japan is to revitalise **rural areas** to cope with the impacts of an aging population and associated labour shortages. The 2020 Basic Plan defined three pillars essential for rural policies: (1) securing income and employment opportunities, (2) improving living conditions of rural areas, and (3) creating new momentum and vitality in rural communities. In June 2021, MAFF released the Plan's mid-term report, written based on discussions with external experts about future visions for rural policies corresponding to these three pillars.

In conjunction with the report, multiple schemes were developed and implemented in 2021-2022:

- **The rural innovation initiative** is a new scheme, aiming to support economic diversification in rural areas. Drawing earnings from two or more sources rather than from agriculture alone can stabilise incomes and secure more job opportunities. Multiple income sources vary such as agro-tourism, food processing, and renewable energy production. Inter-sectoral collaboration through utilisation of local resources is the key to success.
- To improve living conditions particularly in hilly and mountainous areas, MAFF launched the **Region Management Organization for rural areas (RMO) projects**. RMOs are expected to play vital roles in supporting community members, for instance, those who are unable to fulfil their shopping needs, and in preserving rural landscapes to maintain resilience and sustainability of rural communities. MAFF provides financial supports to communities planning to establish the RMOs. By 2027, the RMOs are to be established in more than 100 regions.
- Increasing investment in human capital is essential for rural vitality. MAFF launched **the rural animator training programme** in May 2021. The rural animator is expected to initiate and sustain community activities related to the local economy, supporting the creation of development plans, and showing leadership. The training programme comprises of online courses and practical studies.

Risk management

A series of torrential rains hit Japan in July and August 2021. They triggered severe flooding and landslides in southern, western and eastern Japan, leaving extensive damage to agriculture, forestry and fisheries. Total estimated damages amounted to JPY 129.6 billion (USD 1.2 billion). The government earmarked supplementary budgets of JPY 83.6 billion (USD 0.8 billion) for the restoration efforts in the sector, mostly intended to support the recovery of farmland and agricultural facilities and to conduct work to rehabilitate damaged roads and land subject to landslides.

Trade policy developments in 2021-22

Japan signed **the Regional Comprehensive Economic Partnership (RCEP)** on 15 November 2020 with 14 countries in the Asia-Pacific region, and the trade agreement took effect on 1 January 2022. RCEP is the first EPA that Japan has with China and Korea. On agricultural goods, Japan eliminated tariffs on 56% of imports from China, 49% from Korea, and 61% from ASEAN, Australia and New Zealand respectively. Japan's sensitive agricultural products such as rice, wheat, beef, pork, dairy products and sugar and starch are exempted from tariff elimination and reduction.

Japan's annual export value of agriculture, food, forestry and fishery products exceeded JPY 1 trillion (USD 9.1 billion) in 2021. It took 15 years to achieve the export target of JPY 1 trillion which was first mentioned in 2006. To accelerate this trend, Japan renewed the 2020 Strategy of Export Expansion of Agricultural, Forestry, Fishery Products and Food in December 2021. The renewed strategy includes, for instance, the revision of the Act on Facilitating the Export of Agricultural, Forestry and Fishery Products and Food to stipulate **the commodity associations** for 28 major commodities. They include beef, apple, yellowtail, and scallops. The commodity associations group together different stakeholders within a marketing chain for the purpose of developing overseas markets. To promote Japan-made products, they are expected to create brand standards, determine the quality and production methods of products, and unify sales methods.

Contextual information

Japan is the world's third largest economy after the United States and China with relatively small land area and high population density (Table 17.3). The country has experienced slow economic growth and deflation for most of the past two decades, but has one of the lowest unemployment rates among OECD countries (Figure 17.5). Agriculture constitutes 1% of GDP and 3% of employment in 2020 (Table 17.3), yet the sector accounts for 9% of GDP if all food-related industries are considered (MAFF, 2022[3]). In value terms, livestock accounted for more than one-third of total agricultural production, followed by vegetables (25%), rice (18%) and fruits (10%) in 2020 (MAFF, 2022[4]).

Two-thirds of the country area is covered by mountains, leaving only 12% of the total land area for agriculture, more than half of which are rice paddy fields. Total agricultural land has decreased from 4.8 million hectares in 2000 to 4.4 million hectares in 2020 (MAFF, 2021[5]) due to the abandonment and conversion of farmland to non-farm uses (e.g. residential, industrial, or commercial uses). The agricultural workforce declined by more than half since 1980 to 1.9 million in 2021, and the pace of this decline has accelerated in the last decade (MAFF, 2021[6]). There are 1.03 million commercial farm households, which is less than half the number in 2000. The average farm size increased from 1.4 hectares to 3.2 hectares between 1990 and 2021 (MAFF, 2021[7]), but still remains small compared to other OECD countries. The average age of farmers is 67.8 years in 2020 and about 70% of farmers in Japan are over 65 years old (MAFF, 2021[6]).

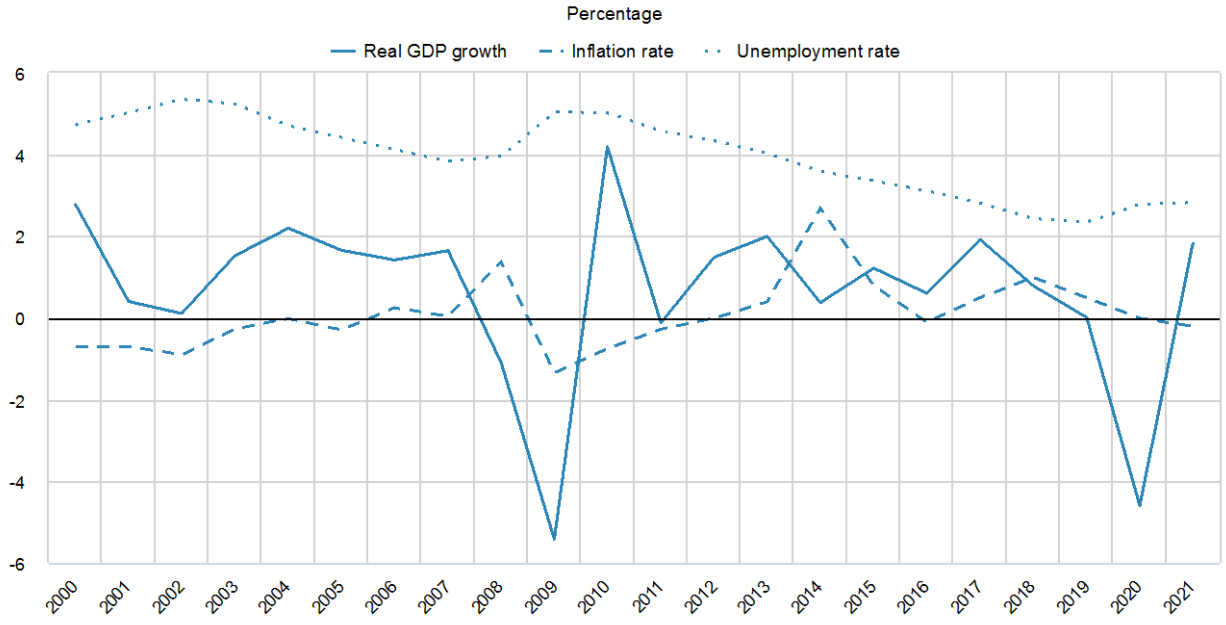
Table 17.3. Japan: Contextual indicators

	Japan		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	3 461	5 251	8.7%	4.8%
Population (million)	127	126	2.9%	2.4%
Land area (thousand km^2)	365	365	0.4%	0.4%
Agricultural area (AA) (thousand ha)	4 830	4 397	0.2%	0.1%
			All countries[1]	
Population density (inhabitants/km^2)	340	337	53	63
GDP per capita (USD in PPPs)	27 285	41 775	9 281	20 929
Trade as % of GDP	9	13	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	1.5	1.0	2.9	4.9
Agriculture share in employment (%)	5.0	3.0	-	-
Agro-food exports (% of total exports)	0.3	1.0	6.2	8.5
Agro-food imports (% of total imports)	9.7	9.2	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	68	64	-	-
Livestock in total agricultural production (%)	31	36	-	-
Share of arable land in AA (%)	93	94	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

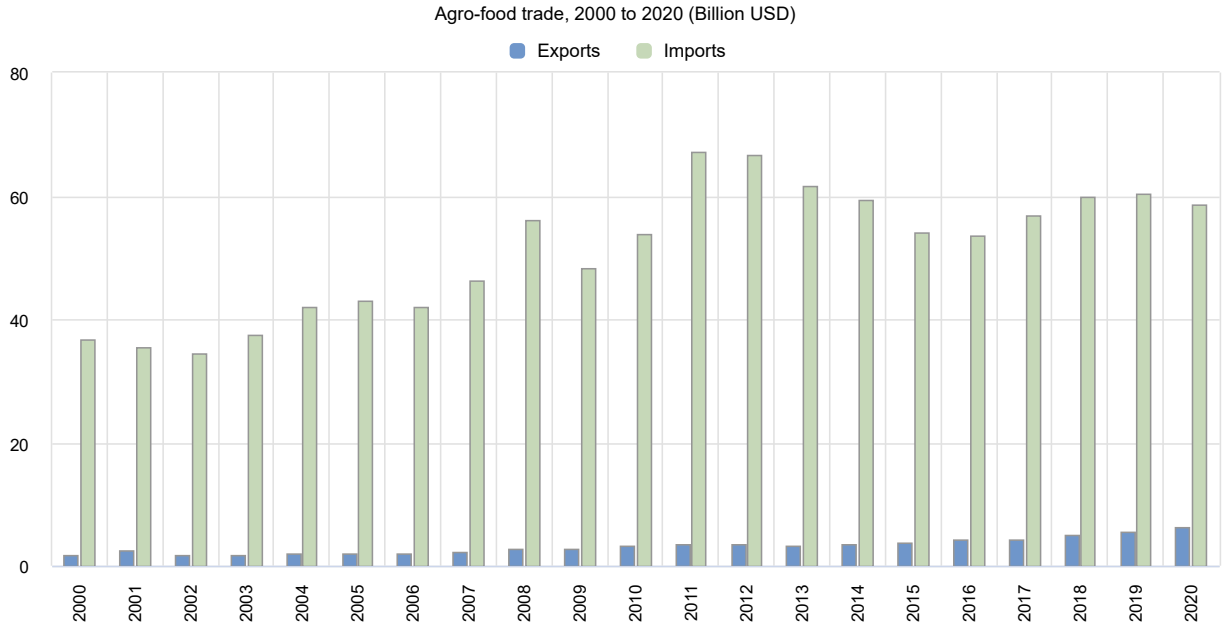
Japan is one of the world's largest importers of agro-food products, and the United States is the biggest source of agricultural imports. The food self-sufficiency rate was 37% in 2020 on a calorie basis, meaning that more than 60% of Japanese calorie supply depended on imports. Agro-food exports are much smaller than imports, but the export value in 2020 increased by 11.6% from the previous year, reaching its highest level at JPY 655 billion (USD 6.1 billion). It is about three times higher than that of 2000 (MAFF, 2021[8]; MAFF, 2021[9]). Most of Japan's agro-food exports are directed at final consumers (Figure 17.6). Processed food products such as alcohol and beverages, sauces and seasonings, and snacks account for the majority of Japan's agro-food exports. Among the unprocessed products, apples, beef and green tea are the most exported.

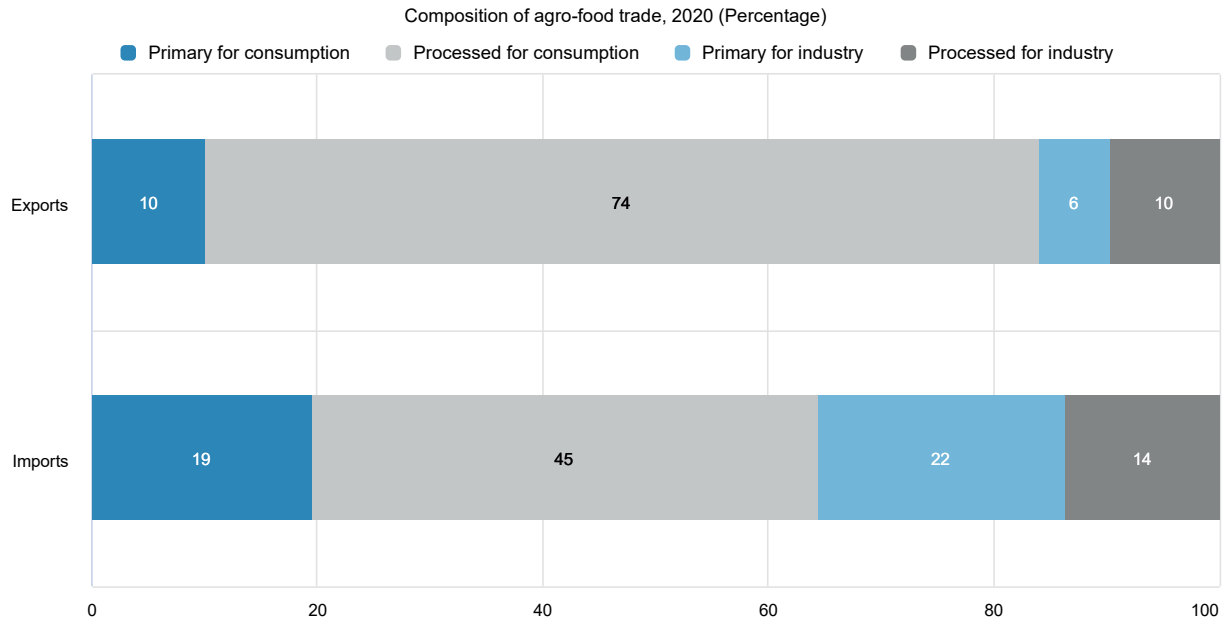
Figure 17.5. Japan: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 17.6. Japan: Agro-food trade



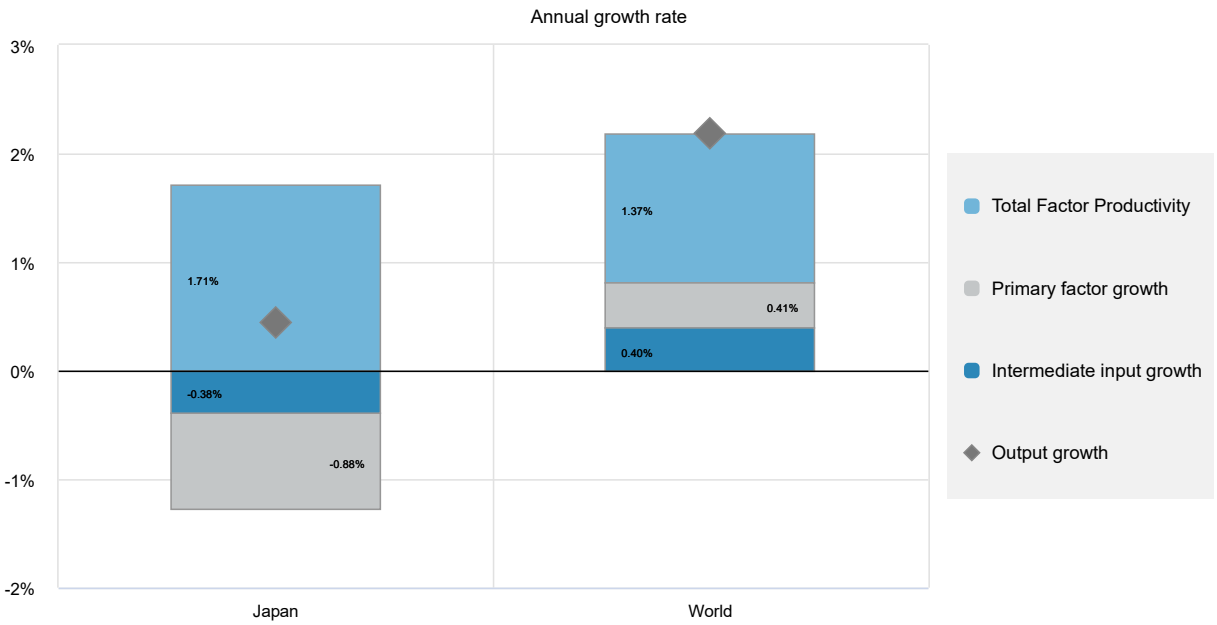


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Japan's agricultural Total Factor Productivity (TFP) growth averaged 1.7% a year between 2010 and 2019, which is slightly above the global average (Figure 17.7, Table 17.4). Recent TFP growth in Japan's primary agriculture has allowed some modest output growth, despite reductions in the use of primary production factors, in particular labour, and intermediate inputs.

Japan's nitrogen and phosphorus balance are among the highest in OECD countries (Table 17.4). The high and increasing nitrogen balance is due to a combination of high fertiliser use, and livestock production on limited pasture land. The high phosphorus balance, in contrast, is partly a result of soil characteristics: the reaction of soil in Japan, particularly Andosols, in which inorganic phosphate renders the phosphate almost insoluble and unavailable for uptake by plants, requiring more intensive phosphorus use by the agricultural sector (OECD, 2019[10]; Shindo, 2012[11]). Agriculture's share of total energy use is below the OECD average, as is its share in GHG emissions. Methane (CH_4) from rice cultivation accounted for the largest share of agricultural emissions (38%), followed by CH_4 from enteric fermentation (24%), CH_4 and nitrous oxide (N_2O) emissions from manure management (19%), and N_2O from agricultural soils (18%). The volume of agricultural water use has remained stable for the past few decades. In 2018, the Japanese agricultural sector used 67.6% of water of which 94% was directed for paddy field irrigation (MLIT, 2021[12]). As a consequence, while average water stress in Japan has fallen somewhat, it remains much higher than the OECD average.

Figure 17.7. Japan: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 17.4. Japan: Productivity and environmental indicators

	Japan		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.0%	1.7%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	170.8	179.3	32.1	30.0
Phosphorus balance, kg/ha	72.0	56.8	3.4	2.9
Agriculture share of total energy use (%)	1.2	1.2	1.7	2.0
Agriculture share of GHG emissions (%)	2.5	2.6	8.6	9.7
Share of irrigated land in AA (%)	54.7	54.4	-	-
Share of agriculture in water abstractions (%)	65.8	67.7	46.3	43.7
Water stress indicator	20.7	18.9	9.7	8.6

Notes: * or closest available year. Data for nutrients balance refer to the year 2016.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Officially called the Public Corporations for Farmland Consolidation to Core Farmers through Renting and Subleasing.

[2] Officially called the Plan for Global Warming Countermeasures of the Ministry of Agriculture, Forestry and Fisheries.

[3] The risk-weighted use of chemical pesticides is estimated with the Acceptable Daily Intake (ADI) basis.

[4] As of 2018, total land under organic farming is 23 700 hectares (equivalent to 0.5% of farmland).

[5] According to MAFF, Smart Agriculture uses robot technology and ICT to achieve ultra-labour-saving and high-quality production.

[6] Officially called the Council for the Realisation of the Vision for a Digital Garden City Nation. “Denen” and “Toshi” mean countryside and city, respectively, in Japanese.

18 Kazakhstan

Support to agriculture

Support to producers in Kazakhstan fell from 8.5% of gross farm receipts in 2000-02 to 6.4% in 2019-21. The share of potentially most-distorting gross producer transfers fell from an average of 98% in the early 2000s to 80% in 2019-21, mostly based on output, including market price support (MPS), and variable input use without constraints. Support based on variable input use and fixed capital formation account for most budgetary transfers to producers. Domestic prices were lower than world prices for several agricultural commodities, generating aggregate MPS worth about -1% of gross farm receipts in 2019-21. Reflecting individual commodity price gaps, single commodity transfers in 2019-21 were negative for rice, sunflower and maize, with the largest positive transfers going to barley and wheat.

Support to general services (GSSE) accounted for 15% of total budgetary support for agriculture in 2019-21 and corresponded to 1.9% of the value of agricultural production. Of this, spending on inspection and control comprised 39% and spending on infrastructure (mostly irrigation and drainage, and the establishment of a digital land cadastre) 38%. Total support to agriculture (TSE) declined from 1.6% of GDP in the early 2000s to 1.1% in 2019-21.

Recent policy changes

Important changes were made to the overarching agricultural development frameworks in 2021, with the endorsement of the National Project and Concept, which set out development goals over the next five and ten years, respectively. The National Project development goals include increasing productivity, exports, agri-food processing and rural incomes. Various measures were outlined to enhance investments in support of these goals, including the provision of subsidised finance, and improvements to agricultural insurance, subsidy mechanisms and the taxation system, and measures to stimulate R&D. The Concept also outlines goals that seek to strengthen the National Project over the longer term by setting stronger targets for productivity and exports while expanding its set of development goals to include agro-industrial investments and food availability.

The endorsement of the new National Project did not result in immediate changes to agricultural subsidies. However, it sets directions for the development of state support, which includes expanded availability to all crop producers regardless of their size, a refocusing towards technological development, and a linking of subsidies to outcomes rather than intermediate processes. Changes were also made to the subsidy eligibility rules for livestock producers to allow greater access for small-scale producers.

KazAgro Holding was merged with Baiterek Holding, the state-owned national development institution, on 15 March 2021. The reorganisation will allow agricultural producers to receive loans based on the “one window” principle, while current conditions for financing agribusiness will remain intact.

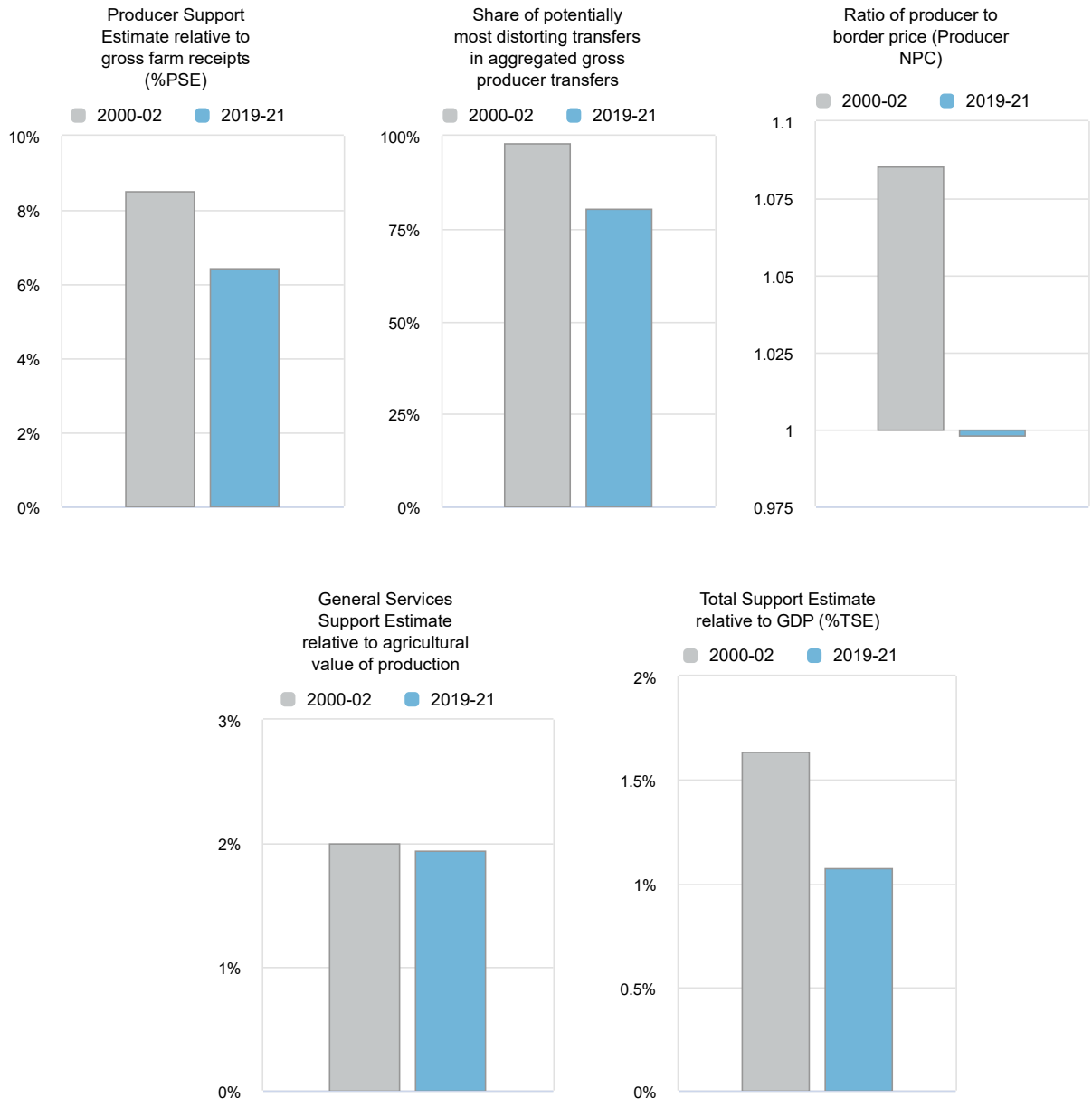
In 2021, Kazakhstan signed a free trade agreement (FTA) between the Eurasian Economic Union (EAEU) and Serbia. The new agreement expands the list of goods that can be traded without customs duties,

including the supply of cheese, alcoholic beverages and cigarettes to Serbia. In addition, the EAEU signed FTAs with Viet Nam, Iran and Singapore.

Assessment and recommendations

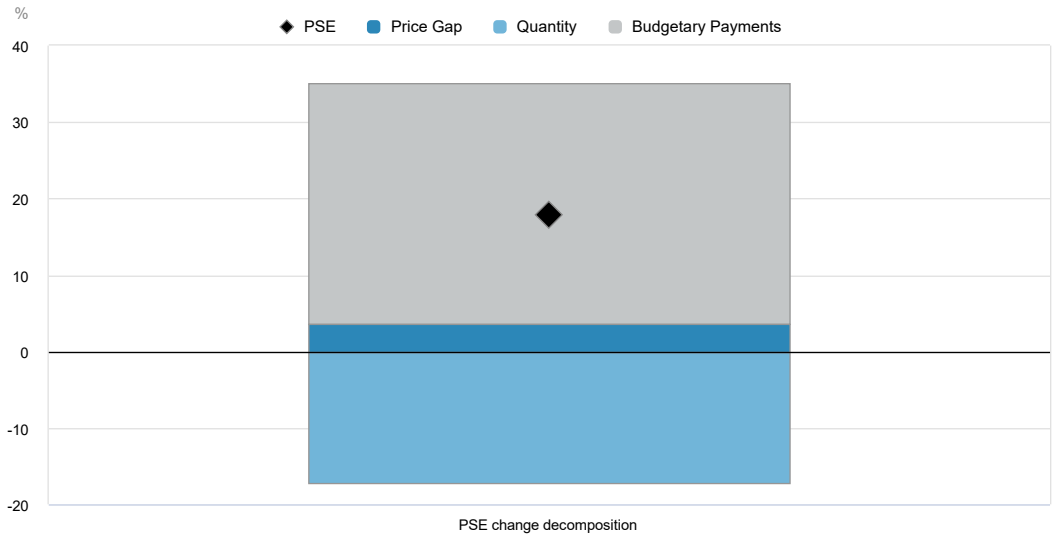
- Agriculture is the second largest emitter of greenhouse gases (GHGs) after the energy sector, and Kazakhstan should specify how much and how to reduce agricultural emissions to meet the country's emission reduction commitments. Moreover, the lack of a coordinated and systemic approach hinders the country's ability to increase its resilience to the effects of climate change, and steps should be taken to enhance agriculture's adaptation to the impacts of climate change.
- While total support to agriculture is small relative to the overall economy, most producer support is potentially most-distorting to agricultural production and trade, and likely to exacerbate pressures on natural resources. In particular, the subsidies for inorganic fertilisers and chemical inputs, and for industrial feed should be re-assessed considering their potential environmental impacts.
- Reform of the crop insurance system is welcome and should increase the role of private insurers, reduce farmers' costs and make the system more transparent.
- Efforts to provide more stable policy, streamline support to fewer measures and create a national digital cadastre database for agriculture increase the transparency and credibility of reform, and should be continued.
- The government continues to focus on increasing the output of domestic processed products to replace processed food imports. Care should be taken to ensure that this objective does not lessen producers' exposure to international competition or divert resources to rent-seeking activities.
- Secure property rights to land – including simplified procedures for land acquisition – are necessary to improve the economic incentives for sustainable resource management. Farm decision-making could be improved by incorporating environmental concerns into agricultural policies.
- Agriculture is among the most risk-prone sectors in the country. Adverse weather conditions, pests and diseases, and price volatility pose challenges for farmers and agribusiness firms, and can strain government finances. Kazakhstan could enhance the resilience of its agriculture sector by adopting a broader, more integrated approach to risk management than the current system of ex ante public sector activity associated with crop and livestock disease, and ad hoc, ex post emergency responses to local disasters.

Figure 18.1. Kazakhstan: Development of support to agriculture



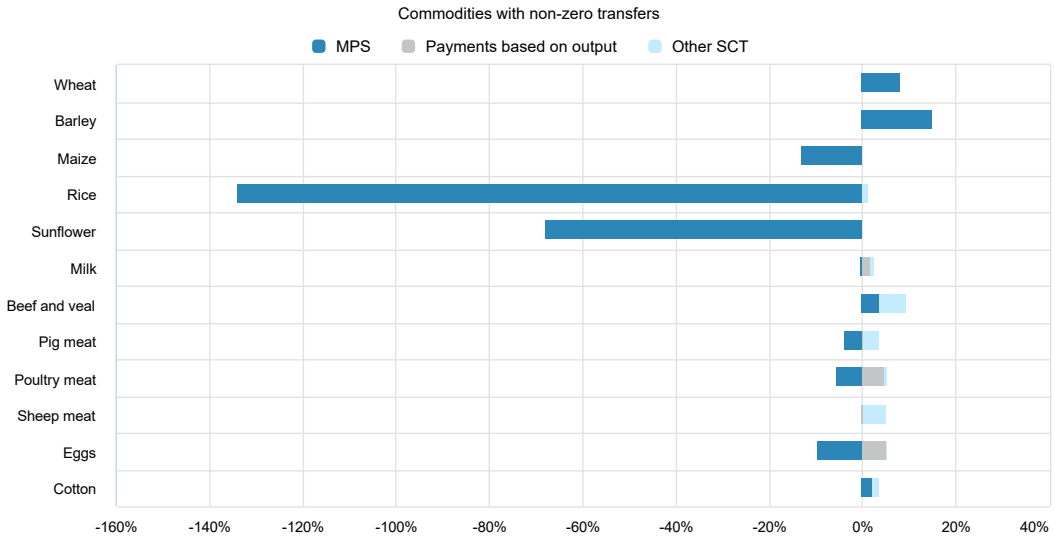
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 18.2. Kazakhstan: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 18.3. Kazakhstan: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 18.1. Kazakhstan: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**3 367**	**15 237**	**13 418**	**15 072**	**17 222**
***of which:** share of MPS commodities (%)*	76.61	62.21	62.40	63.00	61.24
Total value of consumption (at farm gate)	**2 933**	**13 574**	**12 382**	**13 249**	**15 092**
Producer Support Estimate (PSE)	**286**	**1 066**	**1 201**	**931**	**1 065**
Support based on commodity output	268	-120	102	-172	-289
Market Price Support[1]	268	-192	-4	-229	-344
Positive Market Price Support	369	356	364	296	407
Negative Market Price Support	-101	-548	-368	-525	-751
Payments based on output	0	72	105	57	55
Payments based on input use	18	1 149	1 036	1 078	1 333
Based on variable input use	8	757	632	690	950
with input constraints	0	0	0	0	0
Based on fixed capital formation	10	387	400	384	377
with input constraints	0	0	0	0	0
Based on on-farm services	0	5	4	5	6
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	36	63	25	21
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	36	63	25	21
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**8.50**	**6.41**	**8.21**	**5.74**	**5.72**
Producer NPC (coeff.)	**1.09**	**1.00**	**1.01**	**0.99**	**0.99**
Producer NAC (coeff.)	**1.09**	**1.07**	**1.09**	**1.06**	**1.06**
General Services Support Estimate (GSSE)	**67**	**296**	**286**	**335**	**267**
Agricultural knowledge and innovation system	3	56	57	53	57
Inspection and control	29	115	106	154	85
Development and maintenance of infrastructure	28	113	110	116	113
Marketing and promotion	0	5	6	5	5
Cost of public stockholding	5	0	0	0	0
Miscellaneous	1	8	7	8	8
Percentage GSSE (% of TSE)	**18.96**	**15.10**	**14.06**	**18.06**	**13.39**
Consumer Support Estimate (CSE)	**-313**	**783**	**419**	**832**	**1 098**
Transfers to producers from consumers	-288	115	-148	181	311
Other transfers from consumers	-21	-4	-10	-1	0
Transfers to consumers from taxpayers	0	601	549	590	665
Excess feed cost	-4	71	28	63	122
Percentage CSE (%)	**-10.67**	**6.11**	**3.54**	**6.58**	**7.61**
Consumer NPC (coeff.)	**1.12**	**0.99**	**1.01**	**0.99**	**0.98**
Consumer NAC (coeff.)	**1.12**	**0.94**	**0.97**	**0.94**	**0.93**
Total Support Estimate (TSE)	**353**	**1 963**	**2 037**	**1 857**	**1 997**
Transfers from consumers	309	-111	158	-179	-311
Transfers from taxpayers	65	2 078	1 889	2 037	2 308
Budget revenues	-21	-4	-10	-1	0
Percentage TSE (% of GDP)	**1.64**	**1.07**	**1.12**	**1.09**	**1.02**
Total Budgetary Support Estimate (TBSE)	**85**	**2 156**	**2 041**	**2 085**	**2 341**
Percentage TBSE (% of GDP)	**0.39**	**1.18**	**1.12**	**1.22**	**1.19**
GDP deflator (2000-02=100)	**100**	**786**	**770**	**802**	**..**
Exchange rate (national currency per USD)	**147.38**	**407.42**	**382.87**	**413.36**	**426.03**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Kazakhstan are: wheat, rice, maize, barley, sunflower, potatoes, cotton, milk, beef and veal, pig meat, sheep meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

In the late Soviet era, all sectors of Kazakhstan's economy, including agriculture, were regulated by central planning. Production, the marketing of agricultural inputs and outputs, and processing and distribution of food were controlled by state enterprises. Agriculture was supported by high, administered prices and considerable input and output price subsidies, in addition to policies such as cheap energy and transport, which were not agriculture-specific. After the mid-1990s price liberalisation removed the benefit of output prices above world levels and key input prices below them. From the early 2000s, Kazakhstan vacillated in pursuing trade liberalisation. It was not until its accession to the WTO in 2015 that the country implemented more liberal measures.

Kazakhstan became an independent country in 1991 following the collapse of the Soviet Union. Stabilisation and transition to a market economy were its main economic challenges. During the transition, the agricultural sector was affected by economic shocks, land reform and reduced government support. The main agricultural policies were geared towards decreasing food import-dependency and increasing domestic food production (Baubekova, Tikhonova and Kvasha, 2021[1]).

Table 18.2. Kazakhstan: Agricultural policy trends

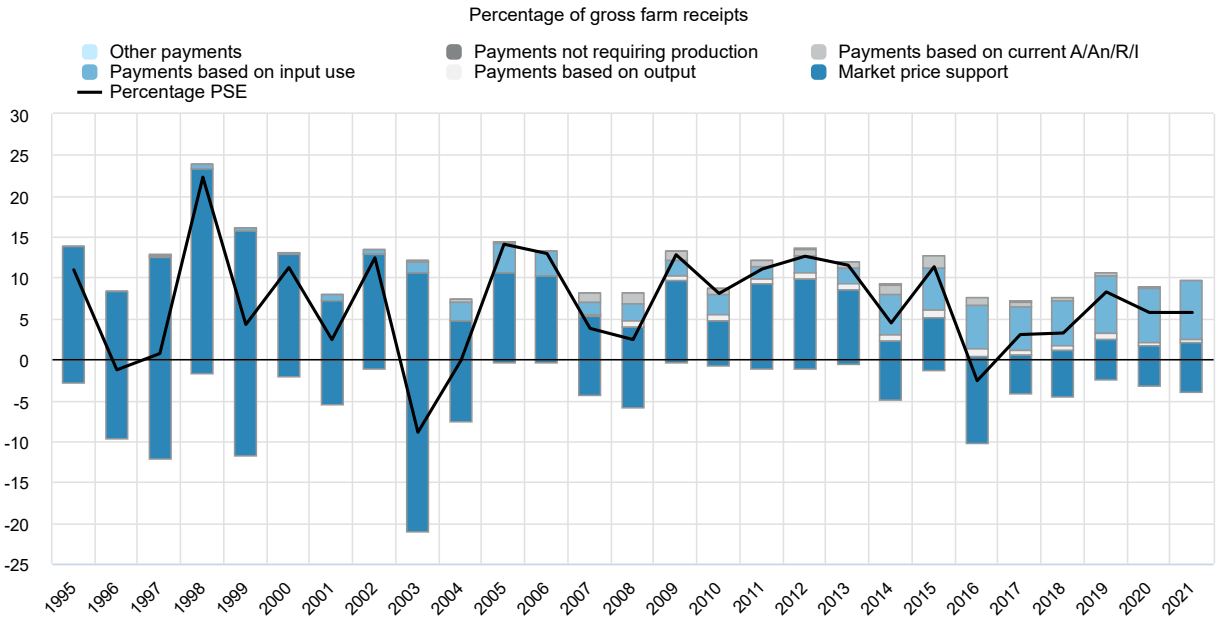
Period	Broader framework	Changes in agricultural policies
Prior to 1992	Soviet era Closed economy	Government control of the agricultural economy through regional trade controls, input supply controls, and the continuation of soft budget constraints Taxation of the agricultural sector to support the industrial sector Tariffs Low administrated prices on energy and transport
1992-1997	Initial structural reforms towards an open economy	Price liberalisation of agricultural products and inputs Emergence of new policy institutions
1998-2002	Economic crisis Stabilisation measures	Debt rescheduling Limited support to the sector Agrarian Credit Corporation created as main agricultural lender (credit at preferential rates) Restructuring agricultural enterprises
2003-2015	Agriculture as part of economic diversification	Price support Support for import-competing products Tariff protection for meat Taxation of agricultural exports
2015-present	Reforms to trade liberalisation	WTO accession 2015 EAEU membership in 2015 Elimination of payments per hectare for priority crops Promotion of agricultural co-operatives Increase in land tax rates Debt restructuring programme Introduction of investment subsidies Introduction of interest concessions Agricultural insurance reform

Source: (OECD, 2013[2]; Baubekova, Tikhonova and Kvasha, 2021[1]).

Producer support in Kazakhstan reveals no distinct long-term trend. The %PSE fluctuated considerably between 1995 and 2020. In some years, negative support provided through depressed market prices for some products offset budgetary allocations and positive support provided through higher domestic prices for others. However, overall policies are supportive of domestic producers (Figure 18.4). Net producer support was positive in most years, due also to increasing support related to the use of production inputs,

in particular credit, over the past ten years. Overall, total budgetary support to agriculture increased relative to the size of the economy, now representing about 1% of GDP. As market price support was estimated as strongly negative in 2016, net TSE shows a substantial drop in that year. However, in addition to budgetary support to producers, support to consumers was also significant in recent years.

Figure 18.4. Kazakhstan: Level and PSE composition by support categories, 1995 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The State Programme of Agro Industrial Complex Development for 2017-2021 (hereafter, "the 2021 State Programme") provided the main agricultural policy framework in Kazakhstan up until the end of 2021. While maintaining the principles of the previous framework (Agribusiness-2020 Programme), the 2021 State Programme put a stronger emphasis on the development of, and support to, individual household plots and small farms, agricultural producer co-operatives and agriculture supporting services and infrastructure. In addition, some input subsidies including on seed, fertiliser and pesticides have been increased.

The National Project for the Development of Agriculture for 2021-2025 (here after "the National Project") and the Concept for the Development of Agriculture for 2021-2030 (here after "the Concept") provide frameworks for the development of the agricultural sector. The National Project was endorsed in October 2021 while the Concept was endorsed in December 2021. More details and both of these policy frameworks are provided in the Domestic policy developments section.

Kazakhstan applies a range of border and domestic price intervention measures. Border measures are implemented within the Customs Union of the Eurasian Economic Union (EAEU) and include tariff rate quotas (TRQs) and non-tariff measures. TRQs apply to imports of lower-grade beef and of poultry products.

Intervention in domestic markets is twofold. The State Commission for the Modernisation of the Economy undertakes intervention purchases of grains to support domestic producer prices. At the same time, consumption price stabilisation is in place for 29 commodities. Purchases occur after harvest at market prices and commodities are stored and released at below-market prices later in the year.

For crops, per tonne payments go to oilseeds, rice, sugar beet and cotton to be used for processing. Headage and output payments support the livestock sector. Large commercial livestock producers receive most of these. Other forms of support to livestock are silage and fodder subsidies, support to artificial insemination and to the purchase of young cattle for feedlots.

Purchases of mineral fertiliser and high-quality seeds receive subsidies. Administered prices below market prices apply to diesel fuel sold to agricultural producers; total volumes supplied at these prices during sowing and harvesting periods are pre-determined as well.

Investment subsidies, together with concessional credit, represent the principal forms of support to agriculture. Concessional credit comes through numerous channels. Several credit agencies provide loans at reduced interest rates under the umbrella of the state company Baiterek Holding, which has absorbed the subsidiaries and functions of KazAgro Holding since 2021 (see details in Domestic policy developments section). Along with agricultural producers, food processors benefit from concessional credit and leasing of machinery and equipment from credit agencies of Baiterek Holding.

The current interest rate subsidy applies to loans issued by financial institutions with a nominal interest rate not exceeding 17% per annum. The interest rate subsidy reduces nominal rates by 10% for loans for the purchase of agricultural machinery, equipment and farm animals, for the purchase of fixed assets, construction, by 9% for replenishment of working capital and by 7% for spring field work and harvesting.

There are separate terms for interest rate subsidies for loan agreements concluded under the Economy of Simple Things programme, designed by the Ministry of National Economy to raise the domestic production and decrease import dependency for consumer products such as of food, textiles, and furniture. The programme is financed by the National Bank and applies to loans with a nominal interest rate not exceeding 15% per annum. For this programme, the interest rate subsidy is transferred through the Damu Fund and local governments, and reduces the nominal interest rate by 10% for loans for investment purposes, by 9% for loans to replenish working capital and for spring field and harvesting work.

The Credit guarantee system is a mechanism for guaranteeing loans from second-tier banks through the Fund for Financial Support to Agriculture.[1] The terms of the guarantee provide for the issuance of a loan of up to KZT 3 billion (USD 7 million) at a rate of no more than 17% per annum, for a period of up to 10 years. The commission for guaranteeing is 30% of the amount of the guarantee, of which 29.9% is paid by the local executive body and 0.1% is paid by the agricultural producer. The guarantee is provided for the implementation of investment projects in all types of activities in agriculture, as well as in the field of food production. At the same time, within the framework of the guarantee, there are priority investment areas, which are supported with higher guarantee rates.

Agricultural enterprises, co-operatives and individual farms benefit from special tax regimes with substantial concessions. For example, corporate and family farms enjoy a 70% discount on all business taxes applied in the country (property tax, social tax, VAT, corporate income tax and tax on vehicles). Since January 2016, primary processors and procurement organisations receive a 100% subsidy of VAT on agricultural products from individual farms.

The land tax applies since 2015. Individual farms of less than 3 500 hectares are eligible for a Single Land Tax set as a percentage of the cadastral value of land owned or used, which replaces the land tax and the five business taxes mentioned above. Since 2015, individual farms pay a 10% income tax for physical persons on an income above KZT 150 million (USD 0.4 million).

Harnessing information technologies is part of Kazakhstan's long-term strategy to simplify, facilitate control, and improve the transparency and effectiveness of government support to agriculture. An electronic system of subsidy payments applies to most subsidy programmes. Applicants to Baiterek credit and leasing can apply electronically.

Work continues by the Ministry of Agriculture, the Ministry of Digital Development, and the Defence and Aerospace Industries on the creation of the National Spatial Data Infrastructure project, which includes a section on agricultural land.

The Law on the Regulation of the Agro-Industrial Complex, signed by the President in October 2019, allows using the results of space monitoring to identify unused lands and return them to state property. A new digital cadastre for agricultural land stores 6.5 million data points on land plots, including soil, geo-botanical and agricultural lands.

Kazakhstan, together with Armenia, Belarus, Kyrgyzstan and the Russian Federation, is a member of the Treaty on the Eurasian Economic Union (EAEU) established in 2015. Kazakhstan's border measures are implemented within the Customs Union of the EAEU and a number of national responsibilities in the area of custom regulations are transferred to the EAEU, including SPS and technical regulations.

Climate change mitigation policies in agriculture

Kazakhstan is a party to the Paris Agreement on Climate Change. Through its Intended Nationally Determined Contribution (NDC), Kazakhstan set an economy-wide target to reduce GHG emissions 15% compared to 1990 by 2030, starting in 2021. This target covers all emissions, including from agriculture. Specific targets or reduction plans for the agricultural sector were not defined. There are also no mitigation policies for the agricultural sector. There are however cross-compliance requirements linked to some support payments that could help lower GHG emissions from agriculture. For example, some interest rate subsidies provided to livestock producers come with an obligation to rehabilitate the pasture lands. If the obligation is not met, the subsidy has to be returned to the government.

According to Kazakhstan's 2021 National Inventory Report submitted to the UNFCCC, agriculture was responsible for 37.1 $MtCO_2e$ of emissions, or 10.4% of total GHG emissions in 2019. Most agriculture emissions are composed of methane (59%), followed by nitrous oxide (41%). Annual GHG emissions from agriculture declined between 1990 and 1997 to 27.3 $MtCO_2e$ but have increased gradually since 1998. Annual emissions in 2019 were still 6.8 $MtCO_2e$ lower than in 1990.

Domestic policy developments in 2021-22

Agricultural development frameworks

The National Project and the Concept were developed with support by the UN Food and Agriculture Organization (FAO), and aim to reflect the UN Sustainable Development Goals. The National Project and the Concept were endorsed in October 2021 and December 2021, respectively. The National Project includes the following goals for enhancing the competitiveness of agro-industrial production, over the next five years: 1) increasing labour productivity by 2.5 times compared to 2019; 2) increasing the supply of locally produced basic food products; 3) doubling food exports compared to 2019, and raising the share of processed foods in total food exports to 70%; 4) generate higher and more stable incomes for 1 million rural people through the establishment of 7 sustainable food ecosystems (meat, fruits vegetables, sugar, dairy, grains, and oilseeds) and the implementation of investment projects. To achieve these goals the National Project includes plans to further develop and improve existing state support measures including through: the expansion of lending and leasing programmes for agribusiness; improvements to agricultural insurance; continued financing of crop cultivation through short and long-term loans; improvement of subsidising mechanisms and introduction of new forms of state support; continued work on forward

contracting of agricultural products to stimulate the cultivation of priority crops; the formation and maintenance of a reserve stock of grain, a forage fund, and stabilisation funds for socially significant food products; improvements to the taxation system; and a continuation of measures to stimulate R&D and build capacity for agro-industrial production.

The Concept sets out a number of key priority areas including: ensuring food security and improving quality of food; adjusting support mechanisms to focus on competitive products; industry development based on manufacturing, digitalisation, sustainability and development of human capital; commercialisation and knowledge tranfser; development and strengthening of phytosanitary and veterinary services; more efficient land use systems and water use for the production of agricultural products; growth of incomes and social support systems for the rural population, development of rural infrastructure; and the creation of production and distribution chains. The Concept also identifies a number of goals that that aim to strengthen those of the National Project by setting stronger targets for productivity and exports, while also expanding its set of development goals to also include for agro-industrial investments and food availability.

Forward contracting and price stabilisation

In 2021, the Food Contract Corporation JSC (FCC) carried out a forward purchase of agricultural products, and in order to stabilise the domestic market, since January 2021, the FCC has sold over 425 000 tonnes of grain. More than 325 000 tonnes of grain were sold to flour milling companies, resulting in mild fluctuations in bread prices and keeping the prices of wheat flour from spiking. In addition, the FCC formed a forage fund from the grain supplied by agricultural producers. In total, about 100 000 tonnes of grain were sold for the needs of livestock and poultry producers. The Food Corporation also purchased 5 000-6 000 tonnes of sunflower and buckwheat to sell to processing enterprises.

Crop subsidies

The endorsement of the new National Project did not result in immediate changes to agricultural subsidies. However, it sets the directions for the development of state support to the crop sector, which include expanded availability to all producers regardless of their size, a refocusing towards technological development, and a linking of subsidies to outcomes rather than intermediate processes.

One of the major changes is the gradual introduction of reciprocal obligations for subsidy payees that are designed to create incentives for diversification, technological change, environmental protection, and to prevent misuse of the subsidies. Other improvements include a reduction in the types of subsidies available and improvements in the efficiency of their administration, such as a reduction in the amount of documentation required and greater use of digital databases and system automation, which could also improve transparency and reduce the risks of corruption. A methodology for monitoring the effectiveness of subsidies is also being developed. More details will be available in 2022, when the final version of the subsidy mechanisms is presented by the Ministry of Agriculture (MoA) to the government.

Another change, which applies to all subsidies (crop subsidies, livestock subsidies, input subsidies, and Interest rate and investment subsidies) is the introduction of the so called “waiting list”, whereby the payment of subsidies will be carried out in turn, according to the date and time of the application. This “waiting list” method of disbursing subsidies was introduced to address the problem of the untimely receipt of subsidies by farmers associated with a shortage of government budget funds.

Livestock subsidies

In July 2021, the current rules for subsidising the development of pedigree livestock were revised. The capacity requirements for subsidised procurement of sheep by feedlots have been reduced from 5 000 heads to 500 heads for farmers of Atyrau, Kyzylorda and Mangystau regions, and to 1 000 heads in other regions. The National Project does not specify the exact changes in the subsidy system for livestock,

however it does set the general direction for improving the subsidy system. Furthermore, subsidies for milk production by co-operatives are to be eliminated, due to difficulties in compliance with sanitary requirements.

Input subsidies

Some additional producer groups were added to those eligible for seed subsidies in 2021. Subsidies are being provided for the use of high productivity and hybrid seeds by producers and agricultural co-operatives cultivating both tomatoes and cucumbers in industrial greenhouses. Subsidies for seeds, fertilisers and pesticides (bioagents) were also extended to producers and co-operatives cultivating crops in industrial greenhouses on land categorised as being for non-agricultural purposes.

Interest rate and investment subsidies, and credit guarantees

There have been amendments to the rules for subsidising rates under loan agreements issued by the Development Bank of Kazakhstan and the Agrarian Credit Corporation under the Employment Roadmap for 2020-2021. The changes concern the origin of the machinery procured. Previously the price ceilings for the machinery eligible for the subsidies were set differently depending on whether the machinery was produced in Kazakhstan or abroad, now – it no longer differentiates between the machinery produced in Kazakhstan or abroad and sets a unified price ceiling.

Merging of KazAgro Holding with Baiterek Holding

On 15 March 2021, KazAgro Holding was merged with Baiterek Holding, the state-owned national development institution. Three subsidiaries of KazAgro Holding were transferred to Baiterek Holding: the Agrarian Credit Corporation (ACC), KazAgroFinance (KAF) and the Fund for Financial Support of Agriculture (FFSA).[2] The FFSA functions for guaranteeing loans will be transferred to the Damu fund. The reorganisation will allow agricultural producers to receive loans on principle of “one window” on the basis of a wide branch network of the ACC. The current conditions for financing agribusiness will remain intact. Currently a roadmap for transferring the functions of KAF to ACC is being developed.

Consumer support measures

In 2021, the FCC expanded its list of procured goods from four to nine products, now including soft wheat, durum wheat, barley, sunflower, rapeseed, flax, buckwheat, oats and soya, to procure and release to processors for producing finished products.

Trade policy developments in 2021-22

The National Project sets the objective to double food exports, and raise the share of processed food in agro-food exports to 70%. Some of the new measures include the development of a network of trade and logistics infrastructure, wholesale distribution centres, the elimination of trade barriers, and the harmonisation of veterinary and phytosanitary requirements. It is envisaged that these measures will be achieved through negotiations with potential importers, foreign partners, as well as participation in the work of international organisations (WTO, OIE, IPPC, Codex Alimentarius Commission, FiBL and IFOAM).

In 2021, an import quota for sugar was introduced on the level of 134 400 tonnes from 15 May 2021 to 30 September 2021. Subsequently, in December 2021 the quota was set to 250 000 tonnes from 20 December 2021 to 31 August 2022.

In August 2021, the government set the quota for the export of sunflower seeds and sunflower oil to 15 000 and 32 000 tonnes, respectively, to secure the local supply of sunflower seeds and oil. Previously there were no quotas on these commodities

In 2021, Kazakhstan signed the free trade agreement (FTA) between the Eurasian Economic Union and its member states, as well as with Serbia. The new agreement expands the list of goods that can be traded without paying customs duty (including the supply of cheese, alcoholic beverages and cigarettes to Serbia).

In accordance with the established rules from 1 January 2021, Kazakhstan assumed chairmanship in all bodies of the EAEU. In March 2021 the President ratified the Agreement on measures aimed at unifying selection and breeding work with farm animals within the framework of the Eurasian Economic Union. The agreement is aimed at developing a common market for livestock breeding between the EAEU countries and removing barriers to mutual trade. In particular, it provides for approval of the created types, lines (breeds) and crosses of farm animals, molecular genetic examination of breeding products, determination of the breed of breeding animals and assessment of their breeding value.

Overall in 2021, the EAEU has signed FTAs with Viet Nam, Serbia, Iran and Singapore, two branch agreements were also adopted aimed at unification of requirements and production of circulation of seed products. Work is underway to form co-ordinated actions in the field of export development, and in addition to five technical regulations that were introduced as part of Kazakhstan's membership in the EAEU (regarding the safety of food products, fish and fish products, milk products, meat products, grain). Furthermore, a technical regulation for the safety of poultry and processed products was also adopted in 2021.

Trade policy responses to the COVID-19 pandemic

In 2021, Kazakhstan distributed 4 500 tonnes of wheat flour to Kyrgyzstan, and 5 000 tonnes of wheat flour to Afghanistan for humanitarian aid purposes.

Contextual information

Kazakhstan has the ninth largest land area in the world and is one of the least densely populated countries. It has the second-highest per-capita availability of arable land in the world. Kazakhstan is also an important exporter of mineral fuels. The country is an upper middle-income economy and the richest country in Central Asia, but its economy remains highly dependent on oil and commodity markets, which can be volatile. An important bottleneck to Kazakhstan's economic development is the state of infrastructure systems, particularly in transport. The share of trade in GDP (25%) is substantially higher than the average for all 54 countries analysed in the report (14%).

Although the contribution of agriculture to the economy has declined sharply since the early 1990s, agriculture remains an important economic sector, contributing to 5.4% of GDP and 15.4% of national employment. Over 75% (or 214.5 million hectares) of the country's territory is suitable for agricultural production, but only about 30% (or 106 million hectares) of the land is currently under agricultural production. Kazakhstan is one of the top ten grain exporters in the world, exporting to over 70 countries. The country's major crops are wheat, barley, cotton and rice, with wheat exports a major source of foreign currency. Livestock products, including dairy goods, leather, meat and wool also comprise an important share of agricultural production.

The farm structure is dualistic: with large-scale and often highly vertically integrated operations dominating the grain sector, while rural households produce the majority of meat and milk. Kazakhstan's agricultural sectors are particularly vulnerable to the effects of climate change, as increasingly frequent hot weather and severe droughts reduce water availability.

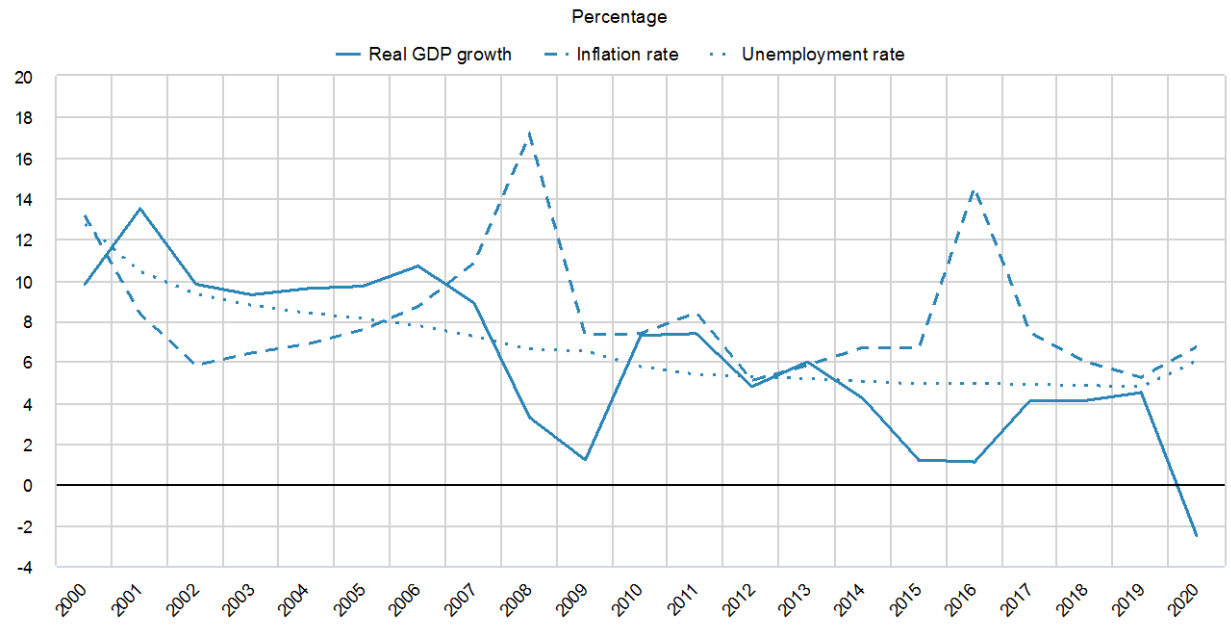
Table 18.3. Kazakhstan: Contextual indicators

	Kazakhstan		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	115	501	0.3%	0.5%
Population (million)	15	19	0.3%	0.4%
Land area (thousand km^2)	2 700	2 700	3.3%	3.3%
Agricultural area (AA) (thousand ha)	215 393	214 453	7.2%	7.3%
			All countries[1]	
Population density (inhabitants/km^2)	6	7	53	63
GDP per capita (USD in PPPs)	7 734	26 729	9 281	20 929
Trade as % of GDP	37	25	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	8.1	5.4	2.9	4.9
Agriculture share in employment (%)	36.6	15.4	-	-
Agro-food exports (% of total exports)	2.0	7.0	6.2	8.5
Agro-food imports (% of total imports)	0.7	10.4	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	56	58	-	-
Livestock in total agricultural production (%)	44	42	-	-
Share of arable land in AA (%)	14	14	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

The COVID-19 pandemic has hit the economy more than the crises in 2008 and 2015. In 2020, the economy contracted by 3% and domestic demand fell sharply because of job losses and lower disposable income (Azamat, 2020[3]). Unlike past recessions, the pandemic has severely hit the retail, hospitality, wholesale and transport sectors. Inflation increased during the coronavirus lockdown, mainly due to rising in food prices. Hoarding, driven by a fear of supply disruptions associated with restrictions on movement, contributed to higher food demand and food prices.

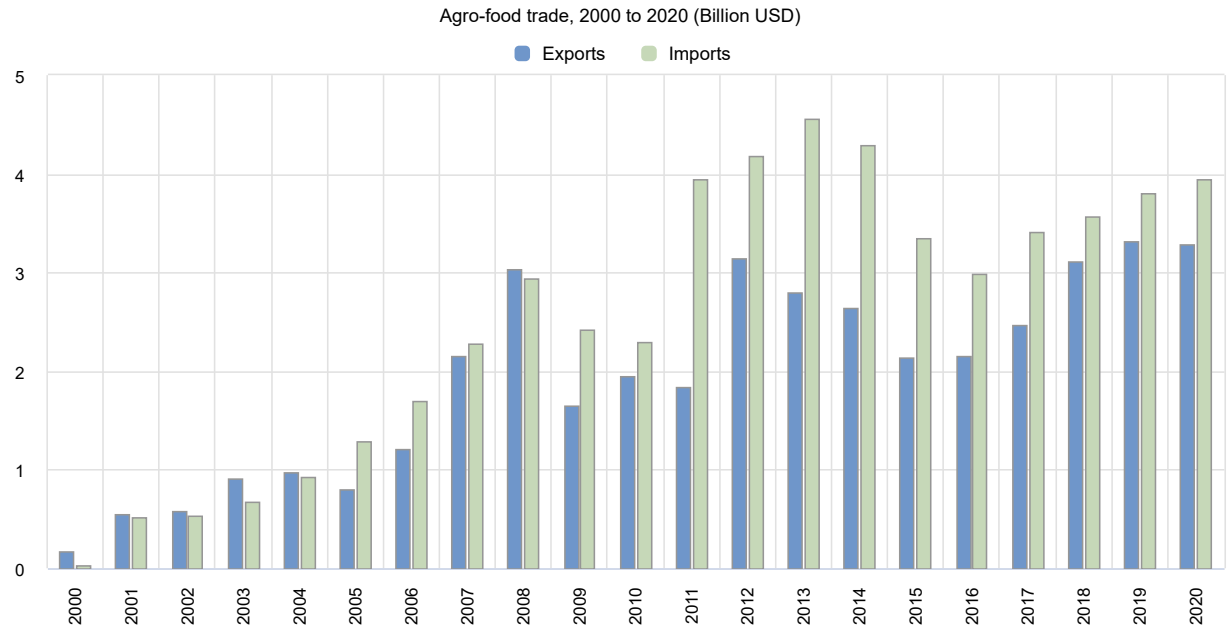
Figure 18.5. Kazakhstan: Main economic indicators, 2000 to 2020

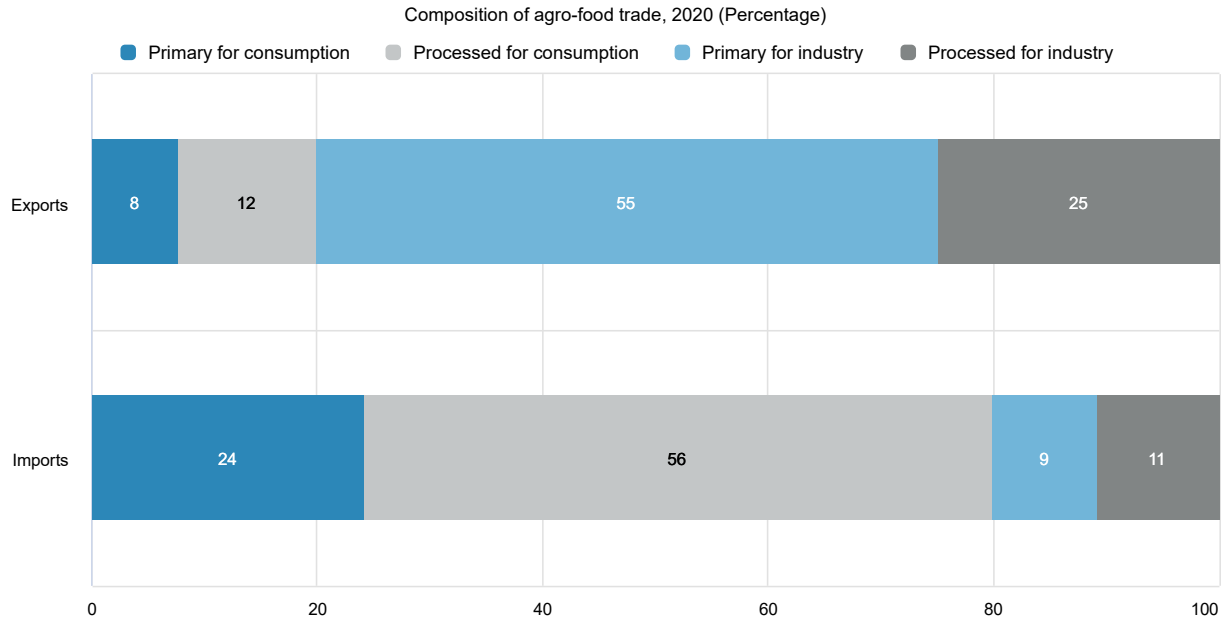


Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Kazakhstan has been a net agro-food importer since the mid-2000s, yet is one of the world's largest wheat exporters. More than 60% of agro-food exports are in primary commodities, the vast majority of which goes to processing by industry. More than 60% of agro-food imports are processed commodities, the bulk of which are for final consumption.

Figure 18.6. Kazakhstan: Agro-food trade



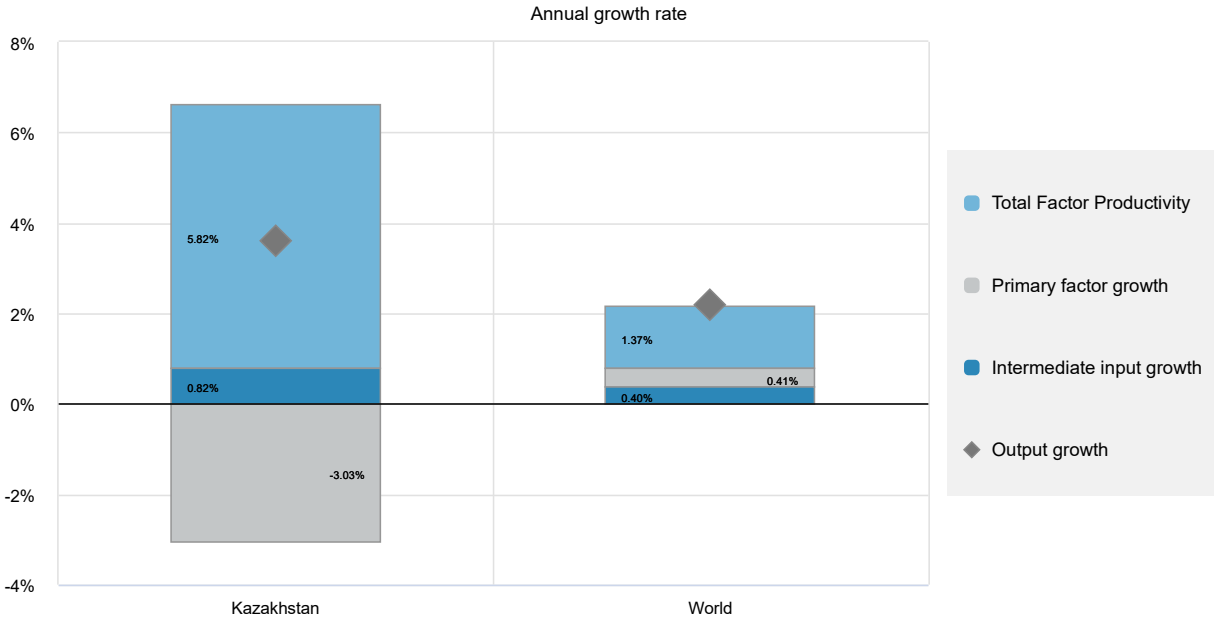


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Agricultural output has grown by about 4% per year between 2010 and 2019, far above the world average over this period. For Kazakhstan, this growth has been driven almost entirely by an impressive increase in TFP of nearly 6%. This along with a relatively minor increase in intermediate input use have easily exceeded a 3% decline in the use of primary factors.

The persistent negative average nutrient balances suggest that soil fertility may be being eroded, which may eventually cause yields and outputs to fall. Agriculture's share of energy use has remained steady, and around double that of the OECD average in 2000 and 2020. Agriculture's share of GHG emissions has fallen and appears to be converging with the OECD average. The share of agriculture in abstracted water has declined, but still remains much higher than the OECD average.

Figure 18.7. Kazakhstan: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 18.4. Kazakhstan: Productivity and environmental indicators

	Kazakhstan		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.4%	5.8%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	-14.8	-14.0	32.1	30.0
Phosphorus balance, kg/ha	-2.7	-2.3	3.4	2.9
Agriculture share of total energy use (%)	4.0	3.9	1.7	2.0
Agriculture share of GHG emissions (%)	13.0	10.5	8.6	9.7
Share of irrigated land in AA (%)	0.5	..	-	-
Share of agriculture in water abstractions (%)	68.1	63.2	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] The Fund for Financial Support to Agriculture is one of the subsidiaries of the former state-owned KazAgro Holding, now under Baiterek Holding.

[2] The FFSA was merged with the ACC at the end of December 2021 and the functions of microfinance, crop insurance and the function of an agent for "Rural Mortgage" within the framework of the project "With a diploma to the village", have been transferred to ACC.

19 Korea

Support to agriculture

Korea reduced support to agriculture over the past thirty years. Producer support declined from 62% of gross farm receipts in 1986-88 to 47% in 2019-21, still well above the OECD average. Potentially most-distorting transfers dominate producer support, mostly in the form of market price support (MPS) from tariff rate quotas (TRQs) with high out-of-quota tariffs. Since 2015, all import restrictions on agricultural products are applied as tariffs and TRQs.

Transfers to specific commodities represented 88% of support to farmers in 2019-21. MPS is also the main component of single commodity transfers (SCT). The share of SCT in commodity gross farm receipts is over 60% for soybeans, red pepper, garlic and barley, and 59% for rice.

Most of the remaining producer support goes to direct payment programmes, which were consolidated into a single programme in 2020. Agricultural insurance schemes and subsidies based on input use make up most of the remaining support, but are considerably smaller than direct payments.

General services expenditures (GSSE) grew in absolute terms but declined in relative terms to 8.3% of the value of agricultural production in 2019-21, and are well above the OECD average. The majority of GSSE went to development and maintenance of infrastructure (54%) with most of the remainder going to agricultural knowledge generation (19%), public stockholding (11%), and inspection and control (9%). Total support to agriculture (TSE) declined from 7.6% of GDP in 1986-88 to 1.5% in 2019-21, still much higher than the OECD average.

Recent policy changes

In 2021, the Korean Government enhanced its monitoring system for the New Direct Payments programme to prevent illegal receipts and increase administrative efficiency. The government expanded the scope of legal obligations for farmers to cover environmental protection and food safety beyond the management of existing farm areas and pesticide usage.

The Fifth Five-Year Plan to Foster Environment-friendly Agriculture (2021-25) was announced in October 2021. It details the government's efforts to expand environmentally friendly agriculture. Development of the Smart Agriculture Project continued in 2021 with the opening of two Smart Farm Innovation Valleys in Gimje, Jeollabuk-do, and Sangju, Gyeongsangbuk-do, in November and December 2021, respectively

The Ministry of Agriculture, Food and Rural Affairs (MAFRA) developed the Fifth Basic Plan to Support Female Farmers (2021-25). The plan aims to increase the participation of women in farming, promote the rights of female farmers and improve their quality of life. The Act on Fostering of and Support for Next Generation Farmers or Fishers and Young Farmers or Fishers passed in May 2021. The act provides an institutional foundation to help successors and young farmers settle in rural villages, to support sustainable rural development.

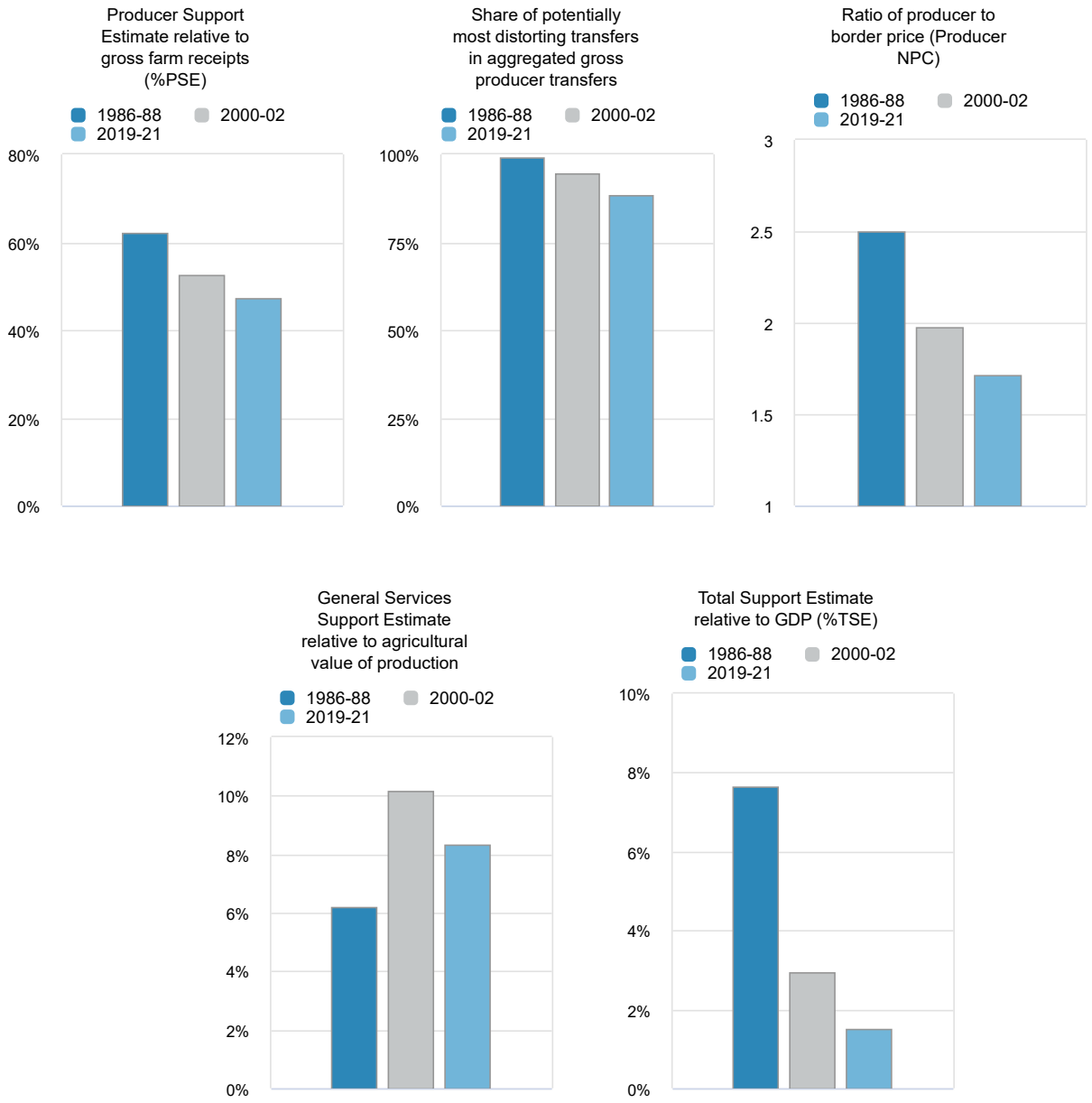
The government published Korea's National Food Plan in September 2021. The plan aims to contribute to the UN's Sustainable Development Goals by ensuring the stable production and supply of food and responding to a host of issues related to food, such as the environment, health and safety.

New sector-specific targets for greenhouse gas (GHG) emission reduction were announced at COP26 in 2021. The new targets require the GHG emissions in the agriculture and fisheries sectors to decline 27.1% relative to 2018 levels by 2030 and 37.7% by 2050. Korea joined the Global Methane Pledge announced at COP26 and set a target of reducing methane emissions 30% relative to 2018 levels nationally and 20.6% in the agricultural sector by 2030. The 2050 Agri-Food Carbon Neutrality Strategy was announced in December 2021. It includes GHG emission reduction plans for food production, distribution, consumption, and energy conversion, and detailed intermediate reduction goals. The strategy strengthens and expands existing efforts for climate change mitigation and adaptation in the agri-food sector.

Assessment and recommendations

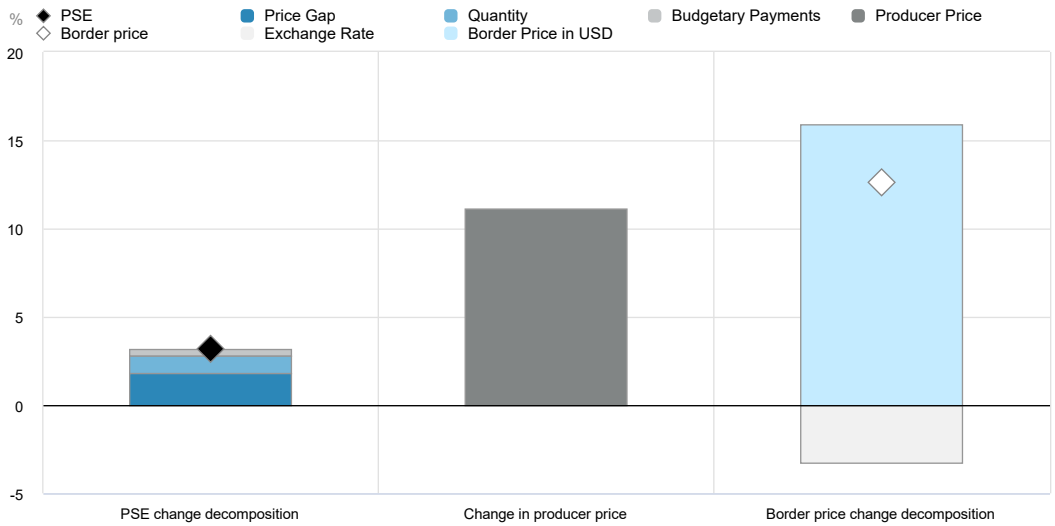
- Korea adopted new sector-specific mitigation targets and a new strategy to reduce GHG emissions. The 2050 Agri-Food Carbon Neutrality Strategy identifies policy options for these targets with the largest reductions expected from reduced use of mineral fertilisers and decreased emissions from enteric fermentation. However, it remains a work-in-progress and the details of how farmers will be incentivised to take up lower emissions practices remain to be finalised. A strong package of incentives will likely be required to ensure the strategy is successful in meeting the GHG emissions reduction targets, but it is important that any new incentives are not distortionary.
- The agricultural sector faces a declining and ageing farm population, pressures to improve productivity and meet societal demands, such as the preservation of natural resources and the environment, including the need to reduce GHG emissions from the sector to meet international commitments. Despite reforms, some agricultural policies do not align with these objectives.
- The high level of support to producers, 2.7 times the OECD average, is dominated by MPS, which distorts producers' decision-making, increases food prices at a time of inflationary pressure, is likely to harm the environment, and hinders agricultural innovation and the sector's capacity to adapt to climate change.
- The New Direct Payment Scheme, which integrated previous schemes into a single system in 2020, is a step towards reducing market distortions through less commodity-specific support and more diversification of agricultural production. Improvements to the scheme, through new monitoring systems and new legal obligations for food safety and environmental protection, can make the scheme more efficient and aligned with sector goals. However, these are not expected to change the overall levels or composition of support.
- Spending on knowledge systems and innovation continued to grow and smart agriculture was identified as an engine of innovation and growth in the sector. Co-operation between central and local governments is needed to ensure this investment benefits all stakeholders. Demonstration of new technologies and joint research programmes with the private sector can also help leverage innovation, investment and growth.
- The COVID-19 pandemic continues to impact the agricultural sector and government policies to address its effects expanded in 2021. It is important that temporary support programmes for effected sectors do not become permanent entitlements, which could be misaligned with wider policy goals for the sector.

Figure 19.1. Korea: Development of support to agriculture



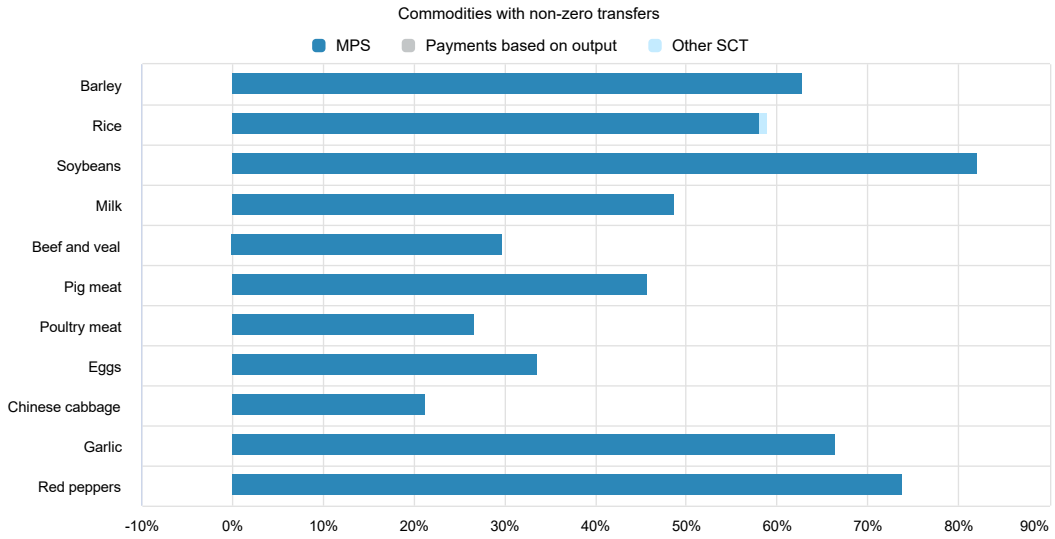
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 19.2. Korea: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 19.3. Korea: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 19.1. Korea: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**16 985**	**26 360**	**43 220**	**42 721**	**42 483**	**44 455**
***of which:** share of MPS commodities (%)*	74.33	63.27	63.72	60.63	60.39	70.15
Total value of consumption (at farm gate)	**17 247**	**33 199**	**59 151**	**60 087**	**58 537**	**58 830**
Producer Support Estimate (PSE)	**10 682**	**14 461**	**21 653**	**19 945**	**21 810**	**23 205**
Support based on commodity output	10 562	13 500	18 953	18 100	18 773	19 986
Market Price Support[1]	10 562	13 500	18 953	18 100	18 773	19 986
Positive Market Price Support	10 562	13 500	18 953	18 100	18 773	19 986
Negative Market Price Support	0	0	0	0	0	0
Payments based on output	0	0	0	0	0	0
Payments based on input use	90	470	556	571	556	542
Based on variable input use	29	207	267	193	298	309
with input constraints	4	34	44	44	46	41
Based on fixed capital formation	57	246	162	198	144	144
with input constraints	0	18	41	37	41	44
Based on on-farm services	4	17	128	180	114	89
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	29	490	495	540	481	464
Based on Receipts / Income	29	292	80	78	78	83
Based on Area planted / Animal numbers	0	198	415	462	403	381
with input constraints	0	160	12	37	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	1 598	733	1 999	2 063
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	0	1 598	733	1 999	2 063
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	1	0	0	0	0
Based on long-term resource retirement	0	1	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	50	0	0	150
Percentage PSE (%)	**62.26**	**52.65**	**47.15**	**44.75**	**47.91**	**48.67**
Producer NPC (coeff.)	**2.50**	**1.97**	**1.71**	**1.66**	**1.73**	**1.75**
Producer NAC (coeff.)	**2.65**	**2.11**	**1.89**	**1.81**	**1.92**	**1.95**
General Services Support Estimate (GSSE)	**1 066**	**2 676**	**3 606**	**4 001**	**3 245**	**3 571**
Agricultural knowledge and innovation system	67	243	875	869	852	904
Inspection and control	26	126	341	316	349	356
Development and maintenance of infrastructure	467	1 811	1 969	2 314	1 704	1 889
Marketing and promotion	0	26	39	37	38	42
Cost of public stockholding	505	471	383	465	302	381
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**8.92**	**15.63**	**14.26**	**16.69**	**12.94**	**13.32**
Consumer Support Estimate (CSE)	**-10 147**	**-15 369**	**-24 277**	**-24 275**	**-24 085**	**-24 471**
Transfers to producers from consumers	-10 015	-12 809	-17 623	-16 971	-17 252	-18 647
Other transfers from consumers	-205	-2 653	-6 689	-7 339	-6 863	-5 866
Transfers to consumers from taxpayers	73	93	36	35	30	41
Excess feed cost	0	0	0	0	0	0
Percentage CSE (%)	**-58.95**	**-46.06**	**-41.06**	**-40.42**	**-41.17**	**-41.63**
Consumer NPC (coeff.)	**2.45**	**1.86**	**1.70**	**1.68**	**1.70**	**1.71**
Consumer NAC (coeff.)	**2.44**	**1.85**	**1.70**	**1.68**	**1.70**	**1.71**
Total Support Estimate (TSE)	**11 821**	**17 230**	**25 295**	**23 981**	**25 085**	**26 817**
Transfers from consumers	10 220	15 462	24 312	24 310	24 115	24 512
Transfers from taxpayers	1 805	4 421	7 671	7 010	7 833	8 171
Budget revenues	-205	-2 653	-6 689	-7 339	-6 863	-5 866
Percentage TSE (% of GDP)	**7.64**	**2.93**	**1.49**	**1.45**	**1.53**	**1.50**
Total Budgetary Support Estimate (TBSE)	**1 258**	**3 731**	**6 341**	**5 881**	**6 312**	**6 831**
Percentage TBSE (% of GDP)	**0.81**	**0.64**	**0.37**	**0.36**	**0.39**	**0.38**
GDP deflator (1986-88=100)	**100**	**209**	**296**	**292**	**296**	**301**
Exchange rate (national currency per USD)	**812.03**	**1 224.03**	**1 163.29**	**1 165.29**	**1 180.13**	**1 144.46**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Korea are: barley, garlic, red pepper, Chinese cabbage, rice, soybean, milk, beef and veal, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Korea's agricultural sector experienced a number of structural changes in a short period, concurrent with its rapid industrialisation and associated economic growth. From the 1950s to the 1970s, the government concentrated primarily on increasing crop productivity and achieving self-sufficiency in staple foods, particularly rice.

Through the late 1980s and the 1990s, the main policy objectives were to restructure the sector and improve its competitiveness, in line with the opening of agricultural markets. With the progressive liberalisation of agriculture and food markets, agricultural policies in Korea adopted more diverse objectives, ranging from enhancing productivity to improving long-term agricultural sustainability. The accelerated growth and industrialisation around cities led to income disparity between farm and urban households.

From the year 2000, emphasis shifted to a broader set of objectives, including the revitalisation of the rural economy, the expansion of export markets, improvements in the environmental performance of agriculture and the promoting the food industry.

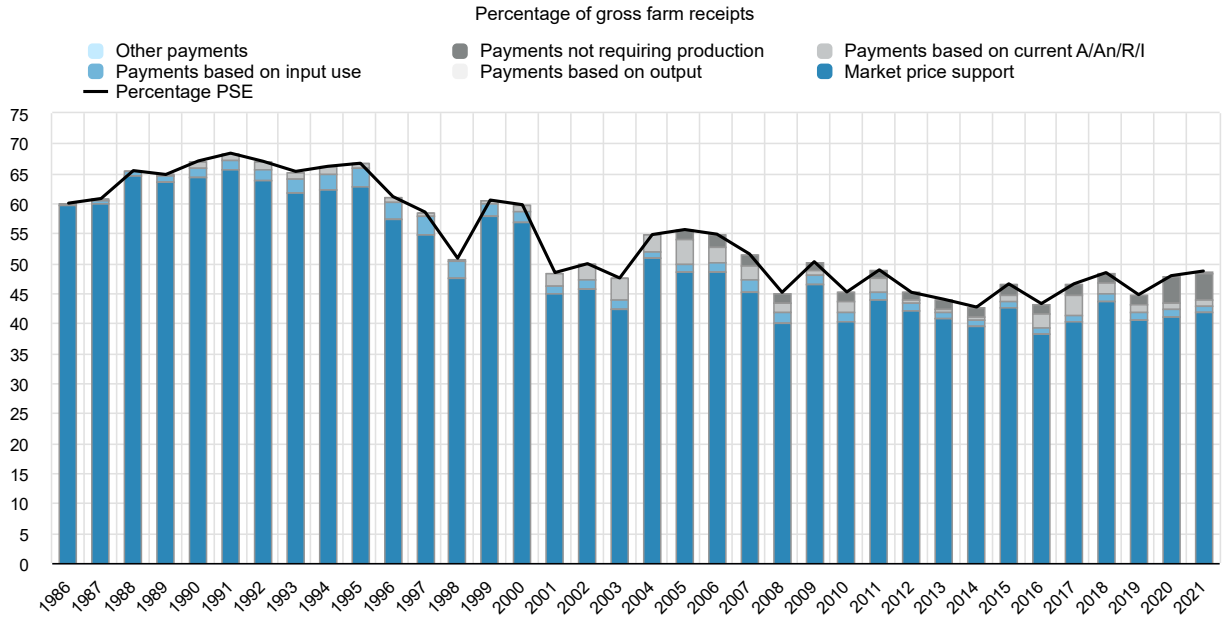
Korea's progressive engagement in multilateral and bilateral trade agreements induced progressive structural adjustments in the agricultural sector. During the late 1990s and 2000s, non-tariff measures on agricultural products were gradually converted to tariffs and tariff rate quotas (TRQs), with the exception of rice as agreed in the Uruguay Round Agreement on Agriculture. In January 2015, non-tariff measures on rice were also replaced by a TRQ (OECD, 2018[1]).

Table 19.2. Korea: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1970s	Relatively closed economy Policy focus on productivity and self-sufficiency	Price supports and government procurement programme for crops Subsidies for inputs (including fertiliser, seeds)
1980-1990	Exposure of domestic producers to open market Structural adjustment programmes	Tariff and non-tariff measures replaced by tariffs and tariff rate quotas (except for rice) Government procurement programme for crops Direct payment programmes (early retirement payments from 1997) Agricultural insurance scheme (from 1997)
2000-present	Responding to changing market demands Diversified policy objectives	Tariffs and tariff rate quotas Tariff concession through Free Trade Agreements Public stockholding scheme for major staple crops Direct payment programme for rice (2005-2019) Direct payment scheme reformed (from 2020) Environment-friendly agricultural programmes

Despite a 20% decline in overall support to farmers as a share of gross farm receipts over the past thirty years, Korea's PSE remains much higher than the OECD average. Market price support is a dominant component of total support to agriculture. The share of the MPS in total support showed only a moderate decrease during the last three decades (Figure 19.4). The share of support for general services slightly increased over the same period.

Figure 19.4. Korea: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Framework Act on Agriculture, Rural Community and Food Industry enacted in 2007 sets Korea's agricultural policy framework. It requires the government to establish a national policy plan every five years. The most recent plan, for 2018-22, includes four main policy objectives: (1) strengthening farmers' income safety net; (2) promoting innovation for sustainable agriculture; (3) enhancing food safety in the supply chain; and (4) improving rural welfare.

The public stockholding scheme for rice, known as the **Public Storage System for Emergencies**, was established in 2005. One of its objectives is to guarantee food security in times of natural disaster, or during a temporary shortage due to mismatching supply and demand. Under the scheme, the government purchases rice from farmers at market price during harvest season and releases the stocks at market prices when necessary. The government has a similar purchasing programme for soybeans.

The New Direct Payment System, introduced in May 2020, combines and replaces the previous agricultural direct payments for landscape conservation, environment-friendly agriculture, livestock products and paddy field farming (in the form of selective direct payments). The income compensation scheme for rice, which had been the main payment scheme in Korea, was also integrated into the new direct payment system. The overarching aims of the new direct payment system are to stabilise the incomes of small to medium-sized farms and to increase farm compliance with regulatory obligations in order to enhance public goods from agriculture and rural communities. In total, farmers have to comply with 17 regulatory obligations covering environmental protection, food safety, and farm management standards such as standards for pesticide application. There is also a direct payment for the transfer of

farming management rights to encourage retired farmers to sell or lease their farmlands while maintaining their incomes, and to increase opportunities for young farmers.

An **agricultural disaster insurance scheme,** which covers 67 crops and 16 livestock products, protects farmers against losses in crop yield and livestock and is supported through subsidised insurance premiums. The government also implemented a pilot project for subsidised agricultural revenue insurance for 7 crops: grape (coverage began in 2015), onion (2015), soybean (2015), garlic (2016), potato (2017) sweat potato (2017), and cabbage (2018). Subsidised work safety insurance is also available and covers injuries, illnesses and accidents, or deaths of farm workers that occur during on farm work and contribute to stabilise farm income. The agricultural disaster insurance, revenue insurance and work safety insurance are all provided by private companies and a government subsidy covers 50% of the insurance premiums.

The rapid economic growth in Korea, mostly in urban centres, has caused several challenges in rural areas. In particular, it has exacerbated the urban-rural gap in terms of residential conditions and community services, led to abandoned and potentially hazardous facilities near rural communities – such as empty houses, livestock barns and factories – and it has led to decreasing rural populations. To address these challenges, Korea has created the **Spatial Plan for Rural Communities**, which is under continuing development and mainly includes improved land use systems, restructured rural areas, and revitalisation of the function of rural villages. The Ministry of Agriculture, Food and Rural Affairs (MAFRA) plans to systematically develop and manage rural areas, address the issue of the hazardous facilities, improve residential space and landscape, and expand projects to provide necessary social services. Along with this effort, the government is supporting people migrating to rural areas to further revitalise these regions. In particular, it provides those wishing to move to rural areas with information tailored to their needs, training and education programmes for hands-on experience and job-seeking as well as a programme exploring culture and tourism sites and offering opportunities to interact with local residents.

The government has increased investment in information and communication technologies (ICT) via its **Smart Agriculture Project**. The programme emphasises the use of digital technologies at the farm level, including the use of big data, artificial intelligence technology and real-time monitoring of crop growth information. The government expects digital technology to improve predictability and mitigate production volatility, increase agricultural productivity, reduce production costs, address issues relating to labour shortages and help farms adapt to climate change. A key component of the project has been the establishment of Smart Farm Innovative Valleys. The Valleys' main functions include training on smart farms for young farmers, the leasing of smart farms, research and development of smart farm technology and the demonstration of smart farm equipment.

MAFRA is striving to educate and train farm successors and young farmers to cope with the aging population and labour shortages in rural areas. Would-be farmers enrolled in agricultural schools are encouraged to start their own agricultural business and make inroads into the agro-food industry, nurturing specialised professionals for each product, selecting farm successors and supporting them with consulting, training on technology and management. It also offers other support in several areas including housing, and farmland leasing to reduce the risk for promising young farmers when establishing their business.

Tariffs and TRQs continue to be the main trade policy measures applied to agriculture in Korea. In-quota tariff rates range from 0% to 50% with out-of-quota rates between 9% and 887%. A TRQ volume of rice (408 700 tonnes, corresponding to about 10.7% of annual rice consumption) is maintained at a 5% tariff rate (the out-of-quota tariff is 513%).

Korea is engaged in 18 bilateral and regional Free Trade Agreements (FTAs). Some of these agreements include significant tariff reductions for livestock and fruit products, but rice is excluded from tariff concessions in existing FTAs. Import tariffs on beef from the United States, Australia and Canada are being progressively phased out over 15-year periods from the entry into force of the respective agreements (March 2012 for the United States, December 2014 for Australia, and January 2015 for Canada). Tariffs on pork from the European Union, the United States and Chile are being phased out over 10 years, and

on pig meat from Canada over 13 years. Tariffs on chicken meat from the United States and the European Union are being abolished over a period of 10 to 13 years after the respective FTAs came into effect (2019 for the United States and 2011 for the European Union).

Climate change mitigation policies in agriculture

GHG emissions from the agricultural sector were 22.2 $MtCO_2eq$ in 2018. Agriculture's share of national emissions declined from 7.4% in 1990 to 2.9% in 2018 despite stable GHG emissions from the sector since 1990. The stability however, is due to the combination of a decline in GHG emission from crop cultivation (CH_4 and N_2O), from decreased farming area, with an increase in GHG emissions from livestock (CH_4) from an increasing number of animals.

New sector-specific targets were announced at COP26 in 2021, bolstering the ambition of Korea across all sectors. The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution, submitted to the UNFCCC in December 2021, and the 2050 Carbon Neutrality Strategy require GHG emissions in agriculture and fisheries to decline 27.1% relative to 2018 levels by 2030 and 37.7% by 2050. Korea joined the Global Methane Pledge announced at COP26 and set a target of reducing methane emission 30% relative to 2018 levels nationally and 20.6% in the agricultural sector by 2030.

The 2050 Agri-Food Carbon Neutrality Strategy, announced in December 2021 contains a detailed implementation plan for the 2050 Carbon Neutral Strategy. The strategy includes GHG emission reduction plans for food production, distribution, consumption and energy conversion, and detailed intermediate reduction goals. The strategy strengthens and expands efforts for climate change mitigation and adaptation in the agri-food sector.

In the crop sector, the strategy aims to reduce GHG emissions by 0.54 $MtCO_2eq$ from rice cultivation through water management and by 2.269 $MtCO_2eq$ from agricultural land by 2050 through reducing excessive use of fertiliser. More specifically, MAFRA plans to reduce GHG emissions through the dissemination and increased usage of alternate wetting and drying (AWD) for rice cultivation and publication of a manual for optimal application of fertilisers. The strategy aims to reduce emissions by expanding the use of organic fertilisers and reducing the use of mineral fertilisers. The strategy targets increased carbon sequestration from soils through no-till farming, the use of biochar and establishment of grasslands. MAFRA is currently considering policy options and incentives to meet these targets.

In the livestock sector, the strategy targets GHG emissions reductions by 2050 of 1.075 $MtCO_2eq$ from enteric fermentation, 2.355 $MtCO_2eq$ from livestock manure and 1.773 $MtCO_2eq$ through enhanced production. This includes developing and disseminating quality forage and low-emission feed, and utilising and recycling livestock manure, for example as organic fertilisers (see above).

Finally, the strategy plans to reduce GHG emissions from distribution and consumption by reducing the carbon footprint of food and food miles by establishing a local food distribution system, expanding online transactions, and reduced food waste through education on dietary patterns.

In January 2022, the Rural Development Administration (RDA) announced the Agricultural Technology Development and Application Plan to Achieve Carbon Neutrality by 2050. The plan aims to develop and improve GHG emissions statistics and calculation methods, and expand the development of low-carbon technologies for the agricultural sector, such as AWD and recycling of livestock manure. Moreover, the plan also aims to increase the use of renewable energy and energy-efficient technologies, and enhance carbon sequestration capacity of farmland soils. The first stage is to disseminate low-carbon agricultural technologies, raise awareness and promote peer-learning through enhanced co-operation between central and local governments and the private sector. These efforts will be supported by the Smart Farm Innovation Valleys, which will demonstrate and disseminate the benefits of precision farming using intelligent machinery and optimum input models, to be developed by the government for each commodity.

The Korean government introduced the Korea Emissions Trading Scheme (KETS) in January 2015, which allocates emissions to companies or workplaces that exceed a defined GHG emissions threshold and imposes reduction obligations. Under this scheme, MAFRA operates voluntary reduction and offset projects external to KETS to reduce GHG emissions in the agricultural sector.

Farmers are not obliged to reduce GHG emissions under KETS, but they can sell offset credits in the emission trading market if the amount of GHG reduction through offset projects is certified. It enables farmers to obtain additional income through GHG reduction activities. MAFRA encourages their participation by subsidising the cost of verification. However, smallholders with difficulty participating in the emission trading market due to administrative costs are provided other incentives equal to the certified reduction amount. In addition, MAFRA is reviewing incentives for farmers to reduce GHG emissions to achieve the 2050 reduction target.

Several policies are in place to reduce GHG emissions indirectly. The new direct payment system enhances environmental cross-compliant requirements and increased green coverage through expanded urban farming. Information programmes on diets could also contribute to reduced emissions in the sector.

Domestic policy developments in 2021-22

The **New Direct Payment System** was introduced in May 2020 to combine previous agricultural direct payment systems. In 2021, the Korean Government enhanced its monitoring system to prevent illegal receipts and increase administrative efficiency. Furthermore, the government expanded the scope of legal obligations for farmers to cover environment protection and food safety, beyond the management of existing farm areas and pesticide usage.

MAFRA is establishing four Smart Farm Innovation Valleys as part of the Smart Agriculture Project. Two **Smart Farm Innovation Valleys** in Gimje, Jeollabuk Province, and Sangju, Gyeongsangbuk Province, started their operation in November and December 2021, respectively. The Gimje Valley will utilise nearby research and development infrastructures such as RDA and the private Seed Valley to facilitate research in smart farming as well as demonstration and certification of smart farming techniques. The Sangju Valley, which is the largest of the four valleys, includes housing and other facilities for students studying at the complex and other young people, as well as smart farms for lease by farmers. MAFRA also plans to prepare data standards for key produce with a view to expanding smart agriculture based on big data and artificial intelligence. MAFRA also plans to invest in infrastructure for data usage such as cloud-based big data platforms.

In May 2021, the **Act on Fostering of and Support for Next Generation Farmers or Fishers and Young Farmers or Fishers** was passed. This act provides an institutional foundation to foster farmers in a systematic manner, help successors and young farmers settle in rural villages, and support sustainable rural development. The government also plans to support successors and young farmers by implementing a variety of other projects, including a framework plan to foster farm successors; a survey to assess the status of young farmers and farm successors; supporting education and employment; and an integrated information system to support programmes, technologies and lifestyles.

In December 2020, MAFRA developed the **Fifth Basic Plan to Support Female Farmers** (2021-25). The plan aims to increase the participation of women in farming, promote the rights of female farmers and improve their quality of life. To achieve these aims, the government plans to implement policies to raise awareness on gender equality in agriculture and rural areas; expand regional development projects to increase the participation of female farmers in the social economy (e.g. economic activities that put more emphasis on social objectives such as caring for family members or organising local events); and build capacity for starting and managing a business. Moreover, increased investment in welfare, culture and health services are expected to enhance the wellbeing of female farmers. In parallel, the government is

developing various educational programmes, strengthening welfare services for foreign women and increasing their stability of accommodation.

The **Fifth Five-Year Plan to Foster Environment-friendly Agriculture** (2021-25), announced in October 2021, contains detailed plans supporting the government's efforts to expand environmentally friendly agriculture. They include reinforced measures to improve the environmental performance of agriculture, strengthened conservation activities at local levels, the expansion of the foundation for production of eco-friendly agriculture, and the diversification of sales network of eco-friendly agro-food.

In 2021, the calculation method for **insurance premiums** for the agriculture disaster insurance scheme was changed for apples and pears to more precisely reflect the level of risk faced by individual farms. The new calculation subdivides the regional units that were previously used to calculate the insurance premiums. Improvements have also been made in response to feedback from farmers, and there have been efforts to prevent moral hazard of farmers (e.g. when individuals take fewer risk-reducing measures after purchasing insurance). These measures include strengthened farm-level monitoring as well as developing a manual for risk-management and an indicator of insurance soundness.

As a pre-emptive **response to Avian Influenza outbreaks** outside Korea, in the second half of 2021, MAFRA strengthened measures including disinfection and restrictions for entering and exiting production sites to stop the introduction of contamination sources. It also strengthened diagnostic tests on wild birds and poultry farms for the rapid detection of infected animals, conducted biweekly assessments of risk factors as a pre-emptive measure, and enhanced testing and public awareness targeting areas with high numbers of egg laying facilities.

In 2021, to fight against **African Swine Fever (ASF)** (which first emerged in 2019), MAFRA designated areas with a high risk of ASF outbreaks as critical control areas while mandating farms to establish enhanced disease control facilities. It also monitored the spread of the disease on pig farms nationally, provided training and promoted disease control protocols, such as disinfection guidelines to reinforce the levels of biosecurity of farms.

The government published Korea's **National Food Plan** in September 2021. The plan aims to contribute to the UN's Sustainable Development Goals and ensure not only the stable production and supply of food but also comprehensively respond to a host of issues related to food such as the environment, health and safety. The first goal of this plan is to establish stable supply chains of food by improving the stockholding system and enhancing international co-operation to secure overseas supply chains. The second goal is to expand sustainable production and consumption. The government plans to promote environmentally friendly agriculture to reduce agriculture's environmental impacts, reduce food waste and pursue an energy transition to reduce GHG emissions. The third goal is to ensure access to healthy and nutritious food, especially for vulnerable people. To achieve this third goal, the plan seeks to improve health and nutrition through strengthening public access to nutritional information, and to improve food safety by expanding the positive list system (PLS) – currently used to set standards for acceptable pesticide residues – to include standards for medicine residues in animal products. To effectively implement the National Food Plan and associated Local Food Plans, the government envisages adding new provisions to the Framework Act on Agriculture, Rural Community and Food Industry.

Domestic policy responses to the COVID-19 pandemic

In 2021, the Korean Government interventions to address the impacts of COVID focused on commodities that have been particularly negatively affected by the COVID-19 pandemic, for example through the cancellation of school meal programmes. Support to farms struggling with management costs and liquidity issues due to decreased sales was continued by MAFRA. Two voucher schemes for stable management were also provided to farms: the first scheme targets farms producing certain commodities that were particularly impacted by disease control measures leading to decreased sales; and the second scheme targets small farms vulnerable to the impact of the COVID-19 pandemic based on certain eligibility criteria.

The government has also worked towards managing imbalances in labour supply and demand to ensure efficient farming activities. To resolve temporary and sporadic labour demand issues, the government enabled the re-distribution of contingent workers to farms and covered a proportion of the costs incurred by farmers. Furthermore, it increased the number of job-matching centres for rural manpower which recruit workers for farms in need. The government eased visa regulations in collaboration with other ministries so that foreign visitors or migrant workers from other industries could work in the agricultural sector. There have also been efforts to encourage promising agro-food businesses with staffing constraints to hire young workers who have struggled to find jobs due to the pandemic.

In 2021, Korea introduced an electronic phytosanitary certification system in response to issues such as delays in customs clearance for agricultural products due to COVID-19, forgery and alteration.

Trade policy developments in 2021-22

On 1 January and 1 March 2021, the Korea-UK Free Trade Agreement (FTA) and the Korea-Panama Free Trade Agreement (FTA) came into force, respectively. Implementation of the Regional Comprehensive Economic Partnership (RCEP) in Korea started on 1 February 2022; RCEP includes 14 other participating countries, namely, the 10 ASEAN member states, as well as the People's Republic of China, Japan, Australia and New Zealand. The Agreement includes strengthened co-operation on transparent and reasonable application of SPS measures and application of strict rule of origin to prevent roundabout import of fresh agricultural products within the region. Tariff reductions for some commodities, including rice, were excluded from the Agreement. After signing FTAs with Israel, Indonesia, Cambodia and the Philippines, domestic procedures are underway. Negotiations are ongoing for agreements with MERCOSUR, Chile, India and Uzbekistan, respectively.

Contextual information

Korea's economy has been growing rapidly over the last two decades led by growth in international trade. Trade represented 30% of GDP in 2020, twice the average of the countries covered in this report. In contrast, the share of agriculture's contribution to GDP fell from 4.3% to 2.0%, and its share of national employment declined from 10.6% to 5.4% during the period of 2000-2020. Although the proportion of agricultural commodities in total exports slightly increased, Korea still remains a large importer of agricultural products (Table 19.3).

Crop production accounted for 59% of the total value of agricultural production in 2020 down from 75% in 2000, due dietary changes and the diversification of production towards livestock and high value products (Table 19.3).

Table 19.3. Korea: Contextual indicators

	Korea		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	872	2 243	2.2%	2.1%
Population (million)	47	52	1.1%	1.0%
Land area (thousand km^2)	96	98	0.1%	0.1%
Agricultural area (AA) (thousand ha)	1 973	1 637	0.1%	0.1%
			All countries[1]	
Population density (inhabitants/km^2)	473	523	53	63
GDP per capita (USD in PPPs)	18 539	43 319	9 281	20 929
Trade as % of GDP	29	30	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	4.3	2.0	2.9	4.9
Agriculture share in employment (%)	10.6	5.4	-	-
Agro-food exports (% of total exports)	0.9	1.4	6.2	8.5
Agro-food imports (% of total imports)	5.2	6.1	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	75	59	-	-
Livestock in total agricultural production (%)	25	41	-	-
Share of arable land in AA (%)	87	83	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Following a contraction of GDP in Korea by 1% in 2020, as a result of the COVID-19 pandemic, GDP returned to growth in 2021, increasing by 4%. Both the level of unemployment and inflation have remained low, although the latter did increase from 0.5% in 2020 to 2.5% in 2021. As an export-oriented economy, Korea is vulnerable to weaknesses in foreign demand and to disruptions in global value chains. In response to COVID-19, a range of policy measures limited the damage to domestic economy, but further global recession would likely affect investment and employment (OECD, 2020[2])(Figure 19.5).

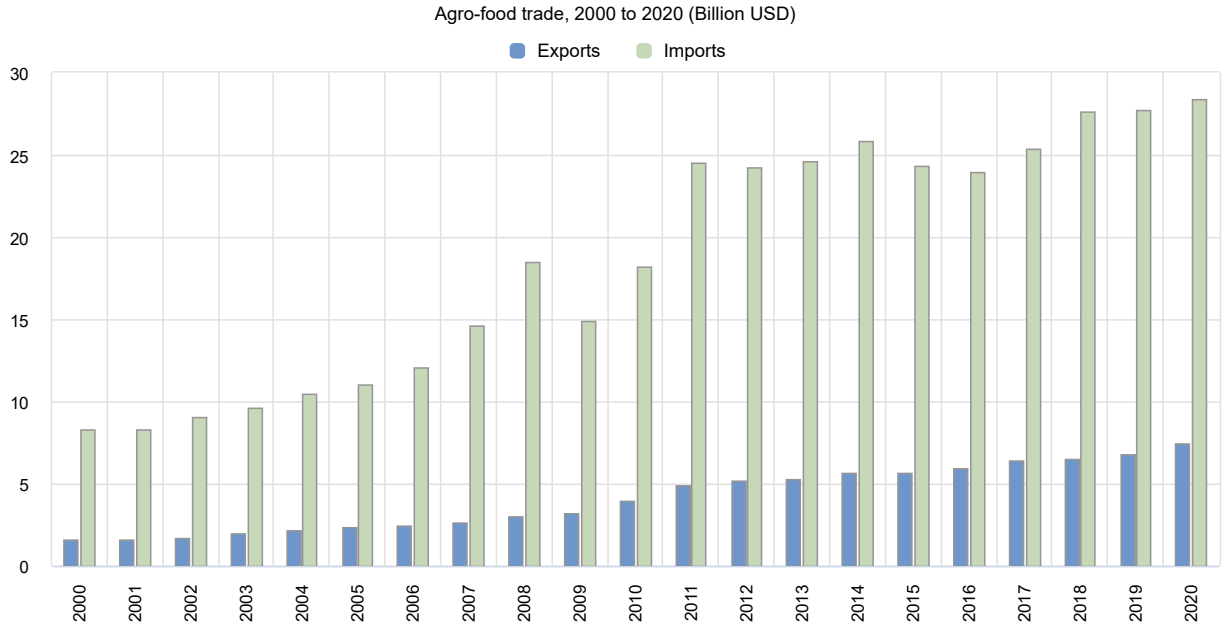
Korea is one of the largest net agro-food importers in the world. While over 85% of agro-food exports are products for final consumption, just under half of imports are destined for further processing by the Korean industry. Key imported agricultural commodities include maize, soybeans and wheat for animal feed (Figure 19.6).

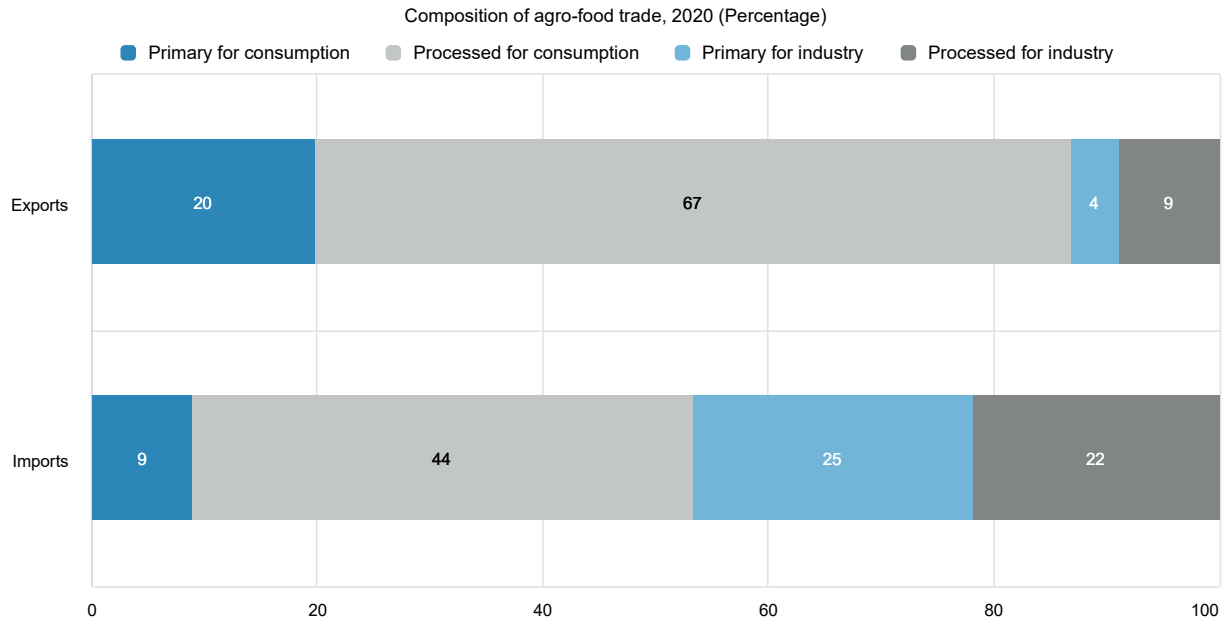
Figure 19.5. Korea: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 19.6. Korea: Agro-food trade



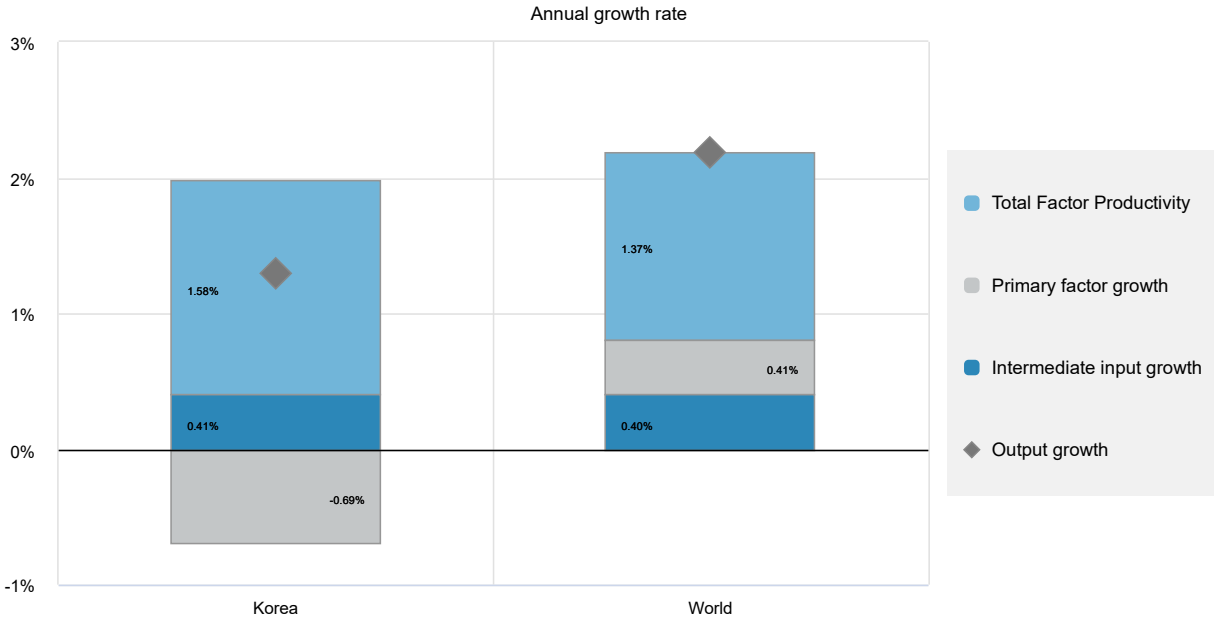


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

At 1.6% per year, total factor productivity (TFP) growth in Korea was slightly higher than the global average over the period of 2010-19. TFP growth offset the declining use of primary factors, causing output to grow slowly over the last decade (Figure 19.7).

The average nitrogen and phosphorus surpluses are still well above OECD averages, partly due to intensive livestock production. The share of agriculture in water withdrawal remains high compared to the OECD average, due to the high proportion of rice paddy fields (50%) in agricultural land area, and water stress has been increasing and remains very high compared to other OECD countries (Table 19.4). The annual GHG emissions from the agricultural sector accounted for just under 3% of total emissions and were 22.2 $MtCO_2eq$ in 2018, of which 6.3 $MtCO_2eq$ came from rice cultivation, 5.5 $MtCO_2eq$ from agricultural soils, 4.5 $MtCO_2eq$ from enteric fermentation and 4.9 $MtCO_2eq$ from manure management.

Figure 19.7. Korea: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 19.4. Korea: Productivity and environmental indicators

	Korea		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	3.4%	1.6%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	230.6	227.8	32.1	30.0
Phosphorus balance, kg/ha	45.4	44.3	3.4	2.9
Agriculture share of total energy use (%)	2.9	0.9	1.7	2.0
Agriculture share of GHG emissions (%)	4.2	2.9	8.6	9.7
Share of irrigated land in AA (%)	41.0	41.0	-	-
Share of agriculture in water abstractions (%)	53.4	50.1	46.3	43.7
Water stress indicator	27.1	29.9	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

OECD (2020), *OECD Economic Surveys: Korea 2020*, OECD Publishing, Paris, https://doi.org/10.1787/2dde9480-en. [2]

OECD (2018), *Innovation, Agricultural Productivity and Sustainability in Korea*, OECD Food and Agricultural Reviews, OECD Publishing, Paris, https://doi.org/10.1787/9789264307773-en. [1]

20 Mexico

Support to agriculture

Mexico's producer support estimate (PSE) for 2019-21 was equivalent to 9% of gross farm receipts, about half the OECD average. Around half of total transfers to producers were in the form of market price support (MPS) through price regulations and border measures. MPS, together with payments based on output quantities and on the unconstrained use of variable inputs, have the greatest potential to distort production and trade, and represent 62% of producer support. While trade liberalisation and domestic policy reforms in the 1990s reduced these forms of support, MPS increased again after 2016.

Input payments mainly support electricity use. Direct payments based on area and payments for afforestation and agroforestry also represents a sizable share of producer support: payments for afforestation and agroforestry accounted for 22% of budgetary transfers to producers.

General services expenditures (GSSE) represented just under 1% of agriculture's value of production, and 9% of agriculture's total support estimate (TSE), lower than the OECD average on both counts. Most of those expenditures are directed to agricultural innovation, extension and training (65%, predominantly technical institutes and vocational schools), and inspection and control activities (12%). Total support to agriculture in Mexico was 0.6% of GDP in 2019-21, close to the OECD average. About a third of this is paid by consumers through higher prices, while the remainder is tax-payer financed.

Recent policy changes

The fertiliser programme provides fertiliser directly to farmers to deal with imperfect input markets and expanded by 160% in 2022 from 2021 levels, and reached beneficiaries from the states of Chiapas, Guerrero, Morelos, Puebla and Tlaxcala – some of the poorest in the country. Support to in-kind loans to livestock producers, a main programme introduced by the new administration in 2019, was defunded in 2020.

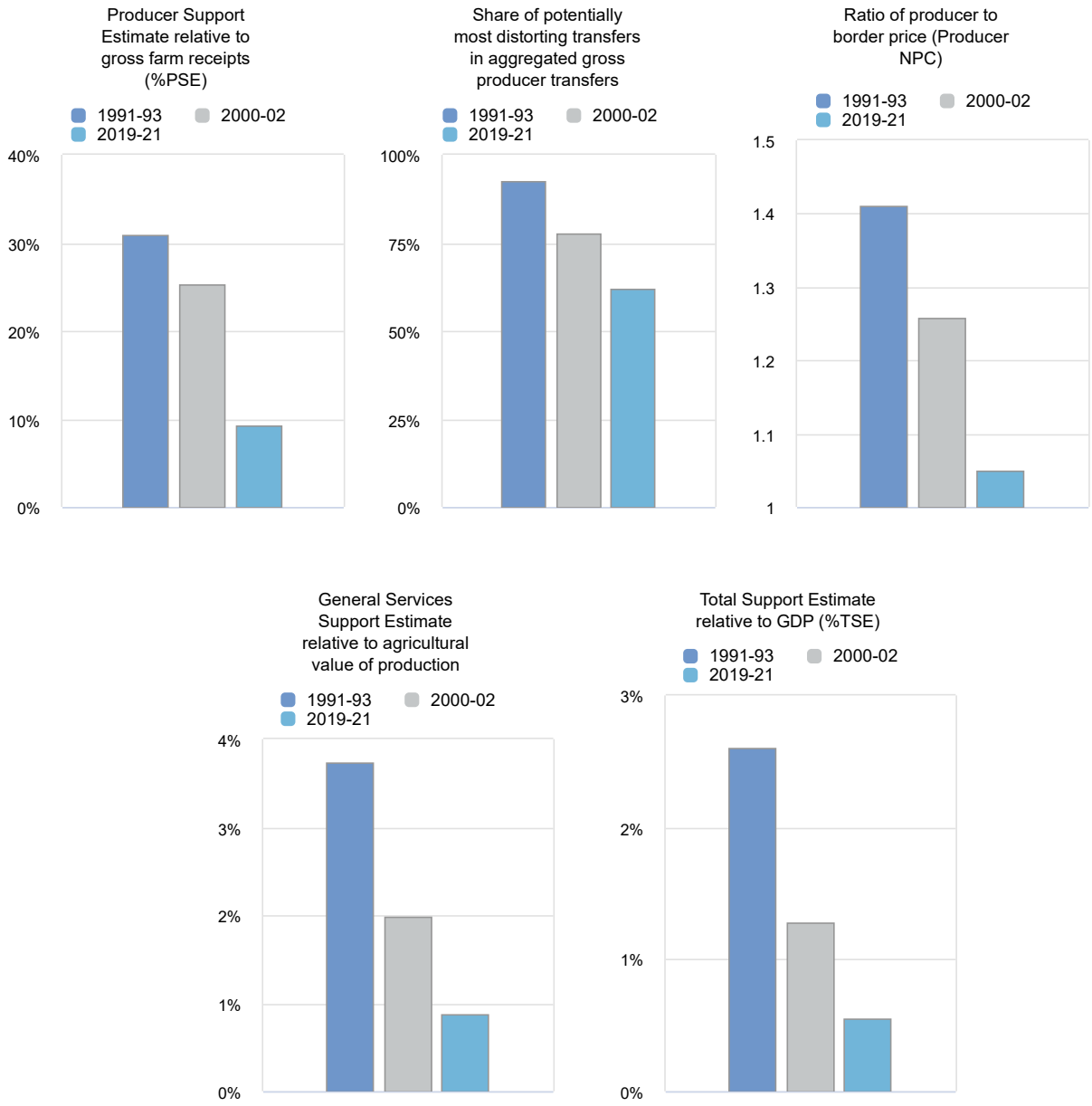
Mexico started phasing out glyphosate and genetically modified corn for human consumption and announced a strategy for reducing burning of agriculture land. In 2022, the Mexican Government developed soil maps with carbon sequestration potential, and launched the National Soil Strategy for Sustainable Agriculture that looks to conserving, restoring and promoting sustainable soil management. In December 2021, Mexico adopted new organic certification requirements for imports of both raw and processed organic products.

The institutional changes to the agriculture ministry (SADER) were formalised in May 2021. SADER is now made up of one undersecretary of food self-sufficiency, one unit of administration and finance, and eight general coordination units.

Assessment and recommendations

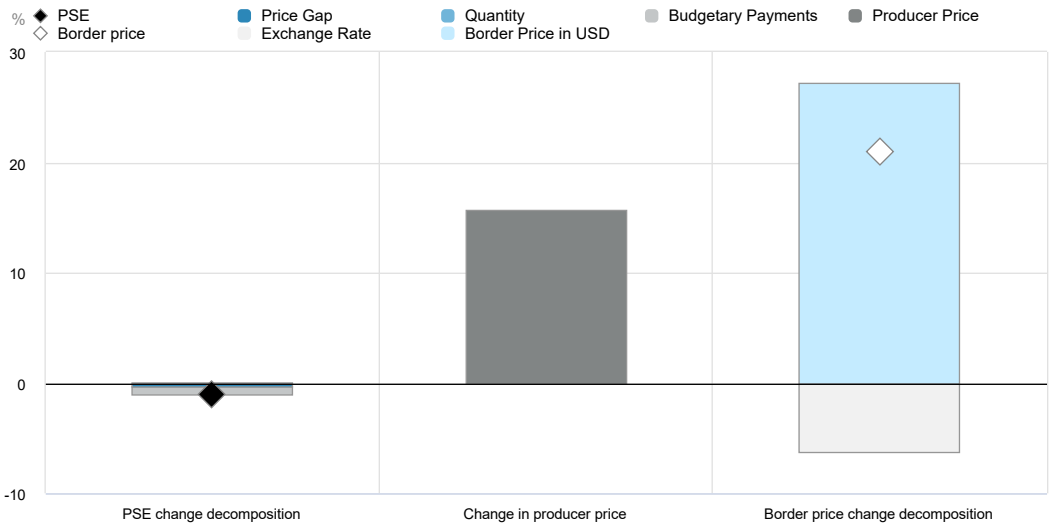
- Mexico's Nationally Determined Contributions (NDC) commits to unconditionally lower greenhouse gas (GHG) emissions 22% and black carbon emissions 51% relative to business-as-usual (BAU) by 2030. These targets cover all sectors. In agriculture, with a target of -8% from projected BAU, actions directed at achieving the NDCs need to be widely spread. For example, support and financing to increase use of bio-digesters in livestock farms and conserve and restore grasslands are limited or non-existent in some regions, so these measures could be scaled up.
- While Mexico's support to agriculture is relatively low, most of the support is considered to be potentially most-distorting; such as MPS and payments based on outputs or the unconstrained use of variable inputs that together represented 6% of gross farm receipts in 2019-21. Despite reforms in the 1990s and 2000s to decrease these forms of support, they increased after 2016. Mexico should consider gradually phasing out price regulations for sugarcane and payments based on electricity consumption, and continue efforts to re-orient payments to schemes targeting poor smallholders.
- Mexico's efforts to reorient its payment schemes to focus on those in need and to provide public goods are commendable. Since 2020, area-based payments (Production for Wellbeing) target producers with fewer than 20 hectares and those in marginalised indigenous communities in the south-eastern states. The Sowing Life programme, implemented in 2019, supports agroforestry projects by small farmers (with 2.5 hectares of available land) in poor municipalities. The Fertiliser Programme was expanded, and targets poor farmers in marginalised areas.
- Despite these efforts, improvements are needed to ensure programmes deliver on their objectives. The Sowing Life programme needs to assure that it does not incentivise farmers to deforest their parcels to become beneficiaries. This programme could consider parallel subsidies for environmental services, which could work as incentives to preserve forests. The Fertiliser Program should only tackle market imperfections that limit poor farmers' access to fertiliser, inputs or credit.
- Most strategic programmes introduced by the current government in 2019 target poor farmers (in-kind loans to livestock producers, guaranteed minimum prices for small-scale producers and transfers to fertiliser consumption). To improve implementation, the programmes should consider soil characteristics and nutrient needs when distributing fertilisers. In addition, the efficiency of these programmes could improve through parallel development of a zoning system that identifies land use based on agri-climates and soil fertility.
- Transitioning to schemes that promote agrobiodiversity using local plant genetic resources (a main ecosystem services that small-scale farmers in poor areas provide) could be more cost-effective in helping poor farmers and increase the resilience of agricultural systems and the genetic diversity of plants. More broadly, conditioning payments on the implementation of sustainable farming could reduce the sector's environmental impact. Support to promote producer organisations, and output and input market access for small-scale and poor farmers, could also help overcome barriers related to scale.
- Investments in general services, mainly related to infrastructure, fell to less than 1% of value of agricultural production. These are crucial to improve the sector's performance and create an enabling environment. In particular, the sector would benefit from greater investments in extension and technical assistance services, price and weather information systems, better agricultural knowledge, innovation systems, and agricultural research and development.

Figure 20.1. Mexico: Development of support to agriculture



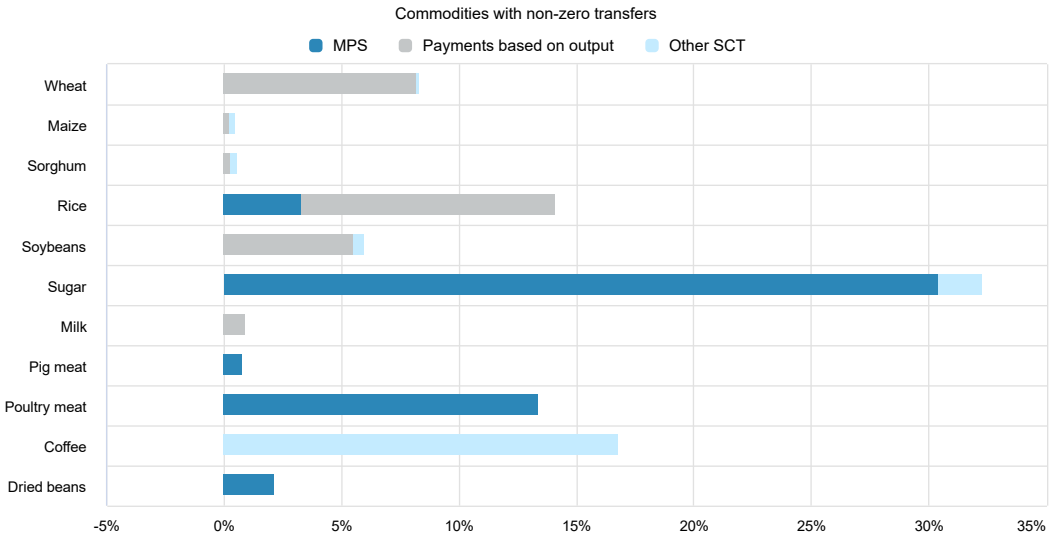
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 20.2. Mexico: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 20.3. Mexico: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 20.1. Mexico: Estimates of support to agriculture

Million USD

	1991-93	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**28 112**	**31 345**	**61 901**	**60 291**	**55 967**	**69 445**
***of which:** share of MPS commodities (%)*	68.31	66.28	61.46	60.96	62.39	61.04
Total value of consumption (at farm gate)	**28 196**	**34 362**	**64 151**	**71 442**	**69 439**	**51 573**
Producer Support Estimate (PSE)	**9 144**	**8 539**	**5 953**	**6 421**	**5 587**	**5 852**
Support based on commodity output	7 698	6 282	3 227	3 610	2 990	3 082
Market Price Support[1]	7 646	5 967	3 081	3 368	2 861	3 014
Positive Market Price Support	7 693	5 999	3 081	3 368	2 861	3 014
Negative Market Price Support	-47	-32	0	0	0	0
Payments based on output	52	315	146	242	129	68
Payments based on input use	1 443	953	978	1 391	766	775
Based on variable input use	746	349	473	544	413	462
with input constraints	0	0	1	3	0	0
Based on fixed capital formation	545	362	341	636	213	173
with input constraints	0	4	57	122	23	28
Based on on-farm services	152	241	164	211	139	140
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	3	137	27	81	0	0
Based on Receipts / Income	0	59	0	0	0	0
Based on Area planted / Animal numbers	3	78	27	81	0	0
with input constraints	0	0	1	3	0	0
Payments based on non-current A/An/R/I, production required	0	0	547	577	499	564
Payments based on non-current A/An/R/I, production not required	0	1 167	0	0	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	1 167	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	1 175	762	1 332	1 431
Based on long-term resource retirement	0	0	1 175	762	1 332	1 431
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**30.91**	**25.22**	**9.18**	**10.14**	**9.52**	**8.10**
Producer NPC (coeff.)	**1.41**	**1.26**	**1.05**	**1.06**	**1.06**	**1.03**
Producer NAC (coeff.)	**1.45**	**1.34**	**1.10**	**1.11**	**1.11**	**1.09**
General Services Support Estimate (GSSE)	**1 048**	**621**	**537**	**485**	**548**	**579**
Agricultural knowledge and innovation system	288	304	348	355	331	358
Inspection and control	0	102	63	80	60	50
Development and maintenance of infrastructure	284	112	124	46	157	171
Marketing and promotion	83	103	2	5	0	0
Cost of public stockholding	392	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**9.49**	**6.52**	**8.07**	**6.75**	**8.71**	**8.77**
Consumer Support Estimate (CSE)	**-7 013**	**-5 520**	**-1 914**	**-2 128**	**-2 306**	**-1 308**
Transfers to producers from consumers	-7 668	-5 893	-2 113	-2 404	-2 464	-1 472
Other transfers from consumers	-396	-124	-1	0	0	-4
Transfers to consumers from taxpayers	852	348	200	275	158	168
Excess feed cost	199	149	0	0	0	0
Percentage CSE (%)	**-25.65**	**-16.27**	**-3.00**	**-2.99**	**-3.33**	**-2.54**
Consumer NPC (coeff.)	**1.40**	**1.21**	**1.03**	**1.03**	**1.04**	**1.03**
Consumer NAC (coeff.)	**1.35**	**1.19**	**1.03**	**1.03**	**1.03**	**1.03**
Total Support Estimate (TSE)	**11 044**	**9 508**	**6 691**	**7 181**	**6 293**	**6 598**
Transfers from consumers	8 064	6 017	2 115	2 404	2 464	1 475
Transfers from taxpayers	3 376	3 616	4 577	4 777	3 829	5 126
Budget revenues	-396	-124	-1	0	0	-4
Percentage TSE (% of GDP)	**2.60**	**1.28**	**0.55**	**0.56**	**0.58**	**0.51**
Total Budgetary Support Estimate (TBSE)	**3 398**	**3 541**	**3 610**	**3 813**	**3 432**	**3 585**
Percentage TBSE (% of GDP)	**0.80**	**0.48**	**0.30**	**0.30**	**0.31**	**0.28**
GDP deflator (1991-93=100)	**100**	**396**	**994**	**956**	**983**	**1 044**
Exchange rate (national currency per USD)	**3.08**	**9.49**	**20.28**	**19.22**	**21.40**	**20.22**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Mexico are: wheat, maize, barley, sorghum, coffee, dried beans, tomatoes, rice, soybean, sugar, milk, beef and veal, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Significant reforms to price support began in the late 1980s and continue to the present day. In 1988-89, guaranteed prices for wheat, sorghum, barley, rice and oilseeds were eliminated.

After the enactment of NAFTA in 1994, guaranteed prices for maize and beans were phased out and replaced by a new system of direct income support payments (PROCAMPO) based on historic cultivated crop area. The government withdrew from procurement and marketing except for beans and maize (although the government sharply reduced its involvement in these crops). Input subsidies for seeds, fertiliser, pesticides, machinery and diesel fuel were reduced, but the input subsidy for electricity to pump groundwater still remains. During trade liberalisation, subsidies for financial instruments to reduce financial risks (price hedge instruments) were also put in place.

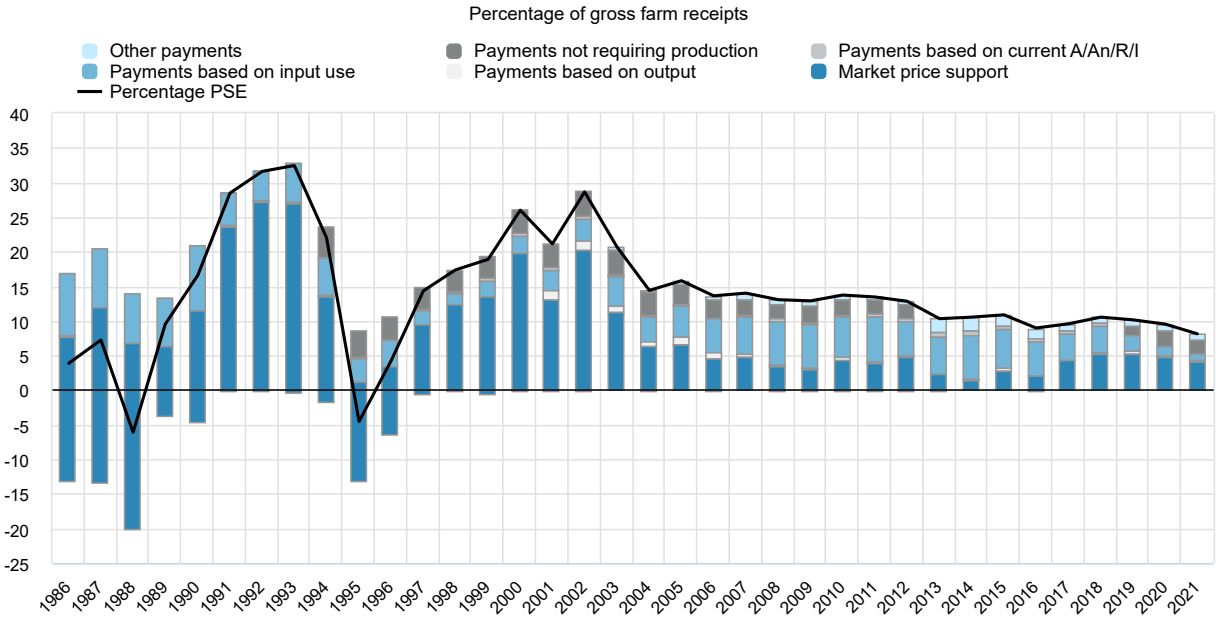
Another shift took place in 2018 to re-direct most payments to small- and medium-scale farmers located in poor rural areas. Some programmes that operated before the 1990s were reinstated, such as minimum guaranteed prices for staple crops. However, their operation differs substantially from the way it operated in the 1990s. In its current version, the government buys crops from a limited number of farmers, mainly smallholders, at a minimum price and distributes the crops at subsidised prices to poor households in both rural and urban areas. The PROCAMPO programme was renamed “Production for Wellbeing” and reformed to provide support only to small- and medium-scale farmers with particular focus on those located in poor communities. Furthermore, price hedge subsidies for large farms and food processors were dismantled.

Table 20.2. Mexico: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1990s	Import substitution model	Agricultural tariffs and import quotas Minimum prices for staple food (maize, rice, beans, wheat, etc.) State food marketing enterprise (CONASUPO) Subsidies for inputs (fertilisers, seeds, electricity for water pumps) Preferential credit
1990-2018	Trade liberalisation	Dismantling of tariffs on agricultural products (except sugar) Dismantling of state marketing enterprise Elimination of input subsidies (except electricity for water pumps) Elimination of minimum prices Reforms to land tenure NAFTA and other FTAs signed Creation of direct payment to farmers (PROCAMPO) Insurance and price hedge subsidies
2018- present	Reforms	Guaranteed minimum prices on staples (maize, beans, wheat, rice and milk) are targeted to smallholders and limited to a certain amount of production volume. Direct payment to small- and medium-size producers Preferential credit Electricity subsidies Fertiliser support targeted to small and medium-scale farmers and limited to only 600kg

Until the early 2000s, producer support comprised mostly market price support. The share of market price support then declined while that of budgetary support grew, until 2016 when market price support and input-based support again became the largest components of producer support.

Figure 20.4. Mexico: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Agricultural support policies in Mexico are guided by the Sectoral Programme for Agriculture and Rural Development 2019-2024. The current Sectoral Programme focuses on three objectives: (1) improve agricultural productivity for food self-sufficiency; (2) bring down poverty rates in rural areas; and (3) increase small-scale agricultural producers' incomes.

Farmers' support policies in Mexico are articulated in three main programmes: (1) guaranteed prices for small-scale farmers; (2) payments based on area; and (3) fertiliser programme. Other relevant support policies include those directed to consumers in vulnerable areas via the distribution of agricultural commodities and sanitary and phytosanitary measures for early detection of pests and diseases.

Guaranteed minimum prices are granted to maize, beans, wheat, milk and rice small and middle size producers (5-30 rain-fed hectares or up to 5 irrigated hectares). Guaranteed prices are set at levels above market prices. LICONSA and DICONSA, are state enterprises that support food actions for vulnerable poor populations. DICONSA sells beans, rice, and corn, among other basic products at subsidised prices in its stores located in vulnerable and poor rural and urban populations. DICONSA procures some of its products directly from smallholders. LICONSA, is another state company that buys milk from small-scale producers then processes and distributes the milk in established stores in limited quantities at subsidised prices for low-income consumers included in social programs.

For wheat and rice producers, SEGALMEX (Mexican Food Security) pays the difference between the reference and guaranteed prices, while for medium-scale maize producers (those with more than 5 hectares and with a maximum of 50 hectares), support is provided for the purchase of risk management

instruments. The reference price is calculated as the sum of the average future price of maize published in the Chicago Board of Trade, converted to Mexican pesos using Banco de Mexico's published average exchange rate, and a commercialisation fee based on transportation costs determined by SEGALMEX. In all cases, there are limits based on volume to the support a single farmer can receive. Lastly, under SEGALMEX, small-scale maize producers are eligible for a transportation subsidy.

The Production for Wellbeing programme focuses on area-based payments that target small and medium producers, including from indigenous communities. Payment rates decrease with farm size and differ by product (Table 20.3).

Table 20.3. "Production for Wellbeing" payment rates

Producer type	Area	Payment per ha
Small producers	Up to 5 rain-fed ha	MXN 2 000 (USD 100)
Medium producers	Between 5 and 20 rain-fed ha or Up to 5 irrigated ha	MXN 1 200 (USD 61)
Coffee producers	No limit	MXN 6 200 (USD 314)
Sugar cane producers	No limit	MXN 7 300 (USD 367)

The Fertiliser Programme grants support to producers of maize, beans, rice or any other crop with cultural and economic impact at the state or regional level holding no more than three hectares located in highly marginalised localities in the states of Chiapas, Guerrero, Morelos, Puebla and Tlaxcala, some of the poorest states in the country. Up to 600 kg of fertiliser per hectare can be granted per producer each year. As part of the expenditures in general services, SENASICA, the agency in charge of implementing sanitary measures in the agri-food chain, implements sanitary and phytosanitary campaigns and measures for early detection of pests and diseases. This programme supports inspection and monitoring projects of sanitary risks, control and prevention of pests and diseases, inspection of goods that are transported in the country, implementation of systems for reducing contamination risks in production units and promotion of good sanitary practices.

The Secretariat of Wellbeing (Social Development Ministry) operates the Sowing Life programme, which supports agroforestry projects implemented by small-scale farmers (having 2.5 hectares of available land) located in poor municipalities. The programme provides direct payments, in-kind support (e.g. plants, seeds, sowing tools and nurseries) and technical support for afforestation and agroforestry projects. Additional support is provided for on-farm consumption of electricity for water pumping via reduced electricity tariffs. Consumer food subsidies are an important poverty alleviation instrument in Mexico.

Climate change mitigation policies in agriculture

Agriculture contributes around 13% of GHG emissions in Mexico. Mexico's pledge to the Paris Climate Conference in December 2015 includes unconditional and conditional targets. Under the 2020 update of its NDC, Mexico committed to unconditionally lower GHG emissions 22% and black carbon emissions[1] 51% relative to BAU by 2030. Agriculture GHG emissions reduction targets are -8%. Depending on international support, this could increase to 36% of total emissions and to 70% of black carbon emissions.

At COP26 of the UN Framework Convention on Climate Change in November 2021, Mexico joined the Global Methane Pledge and the Glasgow leaders' declaration on forests and land use. The Global Methane Pledge calls for voluntary action to reduce global methane emissions 30% from 2020 levels by 2030. The Glasgow leaders' declaration on forests and land use calls for efforts to halt and reverse forest loss and land degradation by 2030.

To achieve these targets, the agricultural sector strategy promotes agricultural practices adapted to climatic and environmental conditions such as soil conservation and reduced burning of residues,

considering community and scientific knowledge; and adopting agroforestry, agroecology and biodigesters on livestock farms.

Domestic policy developments in 2021-22

The budget allocated to the fertiliser programme was expanded by 160% in 2022 from the levels in 2021. With this increase, beneficiaries from the states of Chiapas, Guerrero, Morelos, Puebla and Tlaxcala, some of the poorest states in the country, were added into the programme. The objective of the programme in 2022 is to cover 620 000 hectares and 400 000 small scale producers, of which 35% will be women. Production for Wellbeing is also aiming to reach 30% women's participation in the programme in 2022. The in-kind loans to livestock producers programme on the insignia programmes started by the current government, was unfunded in 2020 due to high administrative costs.

Following the publication of a decree in December 2020, Mexico has started phasing out the use of glyphosate and genetically modified corn for human consumption. According to the decree, both products will be replaced by other alternatives that are more sustainable and culturally appropriate such as organic and biological products, agro-ecological practices and labour intensive practices.

Mexico has announced a new strategy for reducing burning of agriculture land, a widespread practice that not only causes direct emissions but also is responsible for nearly 40% of forest fires. By 2024, the government aims to reduce the frequency of burning on 28 000 hectares. The main mechanisms employed to achieve this goal will be: (1) elaborating a protocol for controlling burning in agro-forestry transition areas; (2) the elaboration of a mobile phone app to notify producers of agriculture burning areas; (3) improving the regulation on the use of prescribed burning on agricultural lands; and (4) training sessions with producers to promote the use of alternative practices.

In 2022, the Mexican Government developed soil maps with carbon sequestration potential, and at the same time, the National Soil Strategy for Sustainable Agriculture was launched. The main objectives of the National Soil Strategy are to conserve soils, restore deteriorated soils, and promote sustainable soil management for agricultural productivity, food security, nutrition, and the overall wellbeing of people, particularly those living in rural areas. In addition, the Strategy also seeks the generation and integration of traditional and scientific knowledge in order to promote technological innovations adapted to different socio-ecological contexts that meet the specific needs of the territories and populations in the country.

Institutional changes were formalised in May 2021 when the decree that establishes the new structure of SADER was published. The SADER is now made up of one undersecretary of food self-sufficiency, one unit of administration and finance and by eight general co-ordination units. The Marketing Support Program of the Agency for Marketing Services and Market Development (ASERCA), which provided support for the purchase of financial instruments for price volatility and contractual agricultural schemes, was dismantled. The Agri-food Markets Intelligence General Coordination will be in charge of promoting policies for improving market functioning of agri-food products.

Climate change adaptation strategies includes promoting sustainable production and consumption practices, incorporating climate risks into value chains, prevention and control of phytosanitary and zoosanitary risks, protection of native crops and promotion of financing mechanisms for confronting the negative impacts brought by climate change. It promotes sustainable production and consumption practices, incorporating climate risk into value chains and investment plans, preventing and controlling pests and animal diseases, strengthening environmental policy instruments to protect native crops from climate change, and financing mechanisms in the primary sector to cope with adverse climate change impacts. In addition, the government aims to strengthen the adaptive capacity of at least 50% of municipalities most vulnerable to climate change, establish early warning and risk management systems at every level of government, and reach a 0% net deforestation rate by 2030.

Domestic policy responses to the COVID-19 pandemic

The government expanded the number of beneficiaries of the Sowing Life programme by 200 000 in 2021. The programme distributes payments, plants and inputs for agroforestry projects to producers with incomes below the poverty line. SADER increased communication with the members of productive chains to ensure food supply, inventories and distribution were not disrupted. Digitalisation services were expanded to speed up food imports. Up to 60% of administrative imports paperwork is now done digitally by the Centre for Documentation and Judgement (CDD) of the National Service for Health, Safety and Agri-food Quality (SENASICA). The government reinforced hygiene inspection systems in food production units and encouraged consumers to follow hygiene practices when handling and preparing food.

Trade policy developments in 2021-22

In December 2021, Mexico adopted new organic certification requirements for imports of organic products including both raw and processed products. The complete list of products that are subject to these regulation was published in December 2021. Between October and December 2021, Mexico established a tariff rate quota (TRQ) for a volume of 500 000 metric tonnes of soybean imports at zero import duty to reduce inflationary pressures.

On April 2022, the WTO panel issued its final report on the dispute of avocados halt imports from Mexico into Costa Rica arguing sanitary and phyto-sanitary problems (SPS). The WTO panel determined that Costa Rica acted inconsistently with Article 1.1 of the SPS Agreement.

Trade policy responses to the COVID-19 pandemic

The government signed a declaration with the governments of Argentina, Brazil, Canada and the United States to keep agro-food commercial flows uninterrupted during the sanitary emergency that started in 2020.

Contextual information

Mexico has a population of 127 million, ranks as the 15th largest world economy and has a per capita GDP just below the average of all countries covered in this report. Agriculture's contribution to GDP has increased slightly since 2000 to just under 4%. Despite the decline over the past two decades, however, agriculture's share of total employment remains comparatively high at more than 12% in 2020, indicating that labour productivity in the sector is well below that of other sectors. Trade is an important driver of Mexico's economy: it represents 37% of GDP and has grown 13 percentage points since 2000. Agro-food trade is an important fraction of total trade, both in terms of exports and imports, representing 8.5% and 6.3% of each, respectively. Since 2015, Mexico has registered a positive and growing net agro-food balance. Whereas most agro-food exports are primary and processed for final consumption, more than half of agro-food imports are intermediate products for further processing.

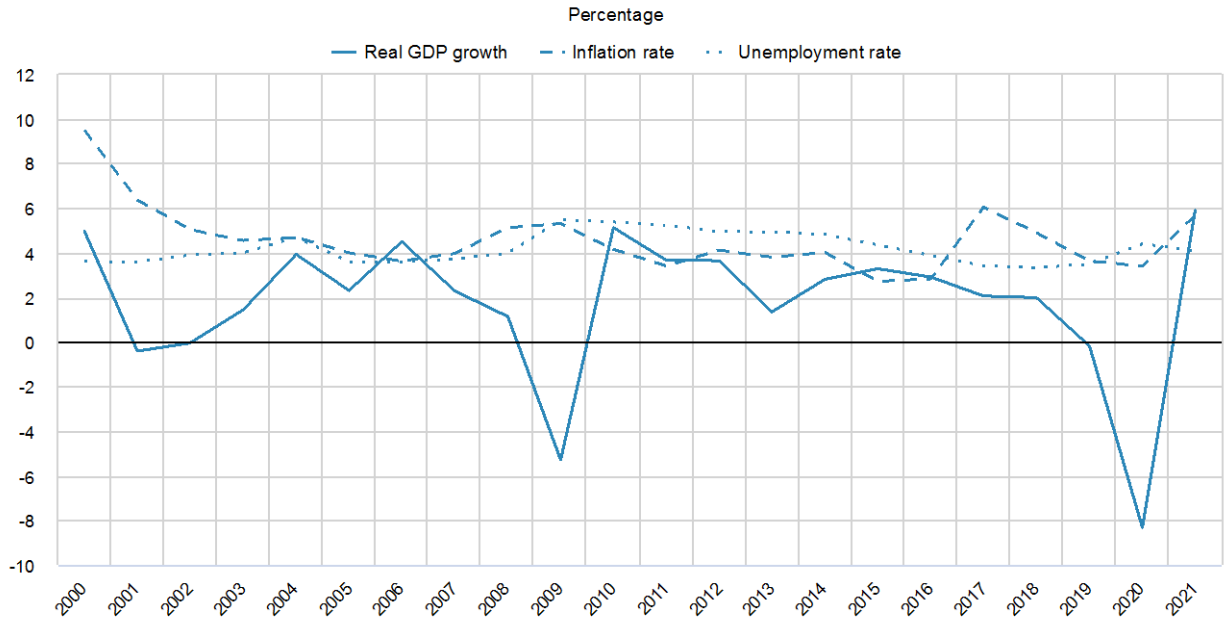
Economic growth has been slowing since 2010 and stalled in 2019. As a result of the COVID-19 pandemic and related restrictions, economic output fell by 8% in 2020, one of the strongest contractions in the country's history. In 2021, the economic growth rebounded but inflation also registered high levels. In 2021, the unemployment rate was at 4%.

Table 20.4. Mexico: Contextual indicators

	Mexico		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	1 097	2 453	2.7%	2.2%
Population (million)	101	127	2.3%	2.4%
Land area (thousand km²)	1 944	1 944	2.4%	2.4%
Agricultural area (AA) (thousand ha)	106 330	96 106	3.5%	3.3%
			All countries[1]	
Population density (inhabitants/km²)	52	65	53	63
GDP per capita (USD in PPPs)	10 870	19 322	9 281	20 929
Trade as % of GDP	24	37	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	3.3	3.8	2.9	4.9
Agriculture share in employment (%)	17.3	12.4	-	-
Agro-food exports (% of total exports)	4.6	8.5	6.2	8.5
Agro-food imports (% of total imports)	5.5	6.3	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	57	58	-	-
Livestock in total agricultural production (%)	43	42	-	-
Share of arable land in AA (%)	22	20	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 20.5. Mexico: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 20.6. Mexico: Agro-food trade

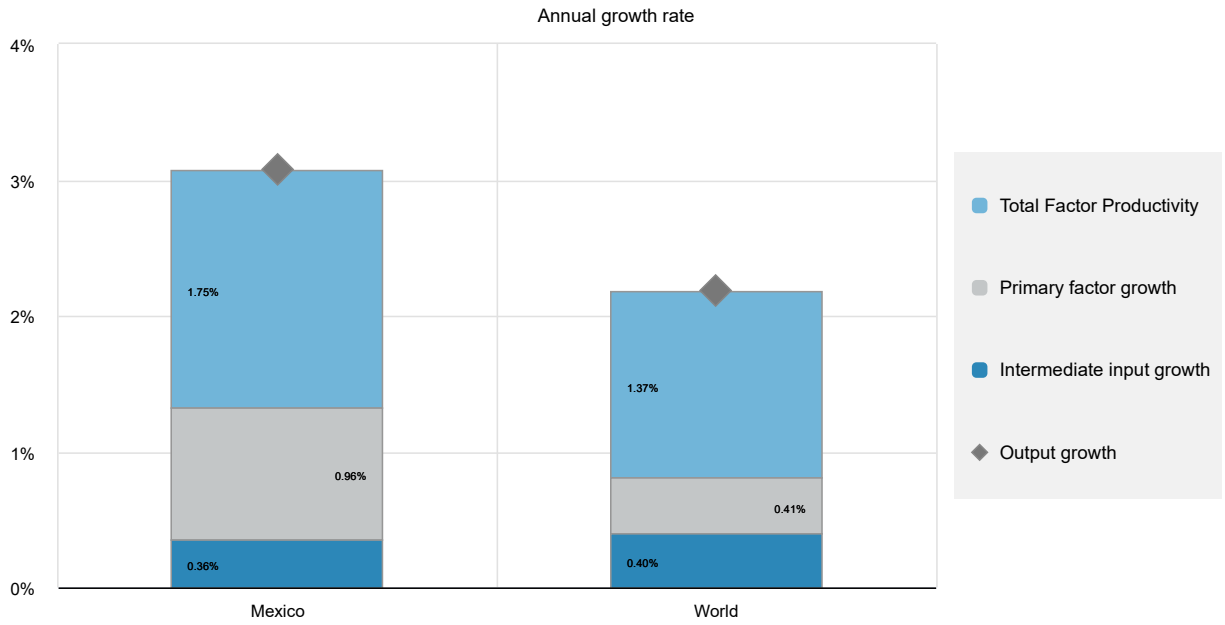


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Agricultural output in Mexico has been increasing predominantly due to Total Factor Productivity (TFP) growth, and to a limited extent to growth in primary factors and more use of intermediate inputs (fertiliser and feed). TFP growth between 2010 and 2019 is estimated to be higher than the world average. In contrast to the average trend observed in the OECD area, nutrient balances in Mexico have increased in the last decade, potentially affecting water and air quality. Agricultural GHG emissions represent 15% of

the country's total, which is higher than the OECD average and is also above its relative contribution to the country's economy. Water stress is well above the OECD average, and agriculture is partly responsible for this pressure due to its high share of total water abstractions.

Figure 20.7. Mexico: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 20.5. Mexico: Productivity and environmental indicators

	Mexico		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	2.5%	1.8%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	25.2	30.5	32.1	30.0
Phosphorus balance, kg/ha	1.6	1.9	3.4	2.9
Agriculture share of total energy use (%)	3.0	3.6	1.7	2.0
Agriculture share of GHG emissions (%)	17.3	14.6	8.6	9.7
Share of irrigated land in AA (%)	4.5	6.3	-	-
Share of agriculture in water abstractions (%)	82.0	75.7	46.3	43.7
Water stress indicator	15.6	19.8	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

Note

[1] Black carbon is particular matter formed by the incomplete combustion of fossil, biofuels and biomass; it is a short-lived but powerful climate warming pollutant.

21 New Zealand

Support to agriculture

Since New Zealand's reform of agricultural policies in the mid-1980s, its production- and trade-distorting policies almost disappeared and support to agricultural producers has been the lowest among OECD countries. Over the past decade, support consistently accounted for less than 1% of farm receipts, with an average 0.8% during 2019-21. Almost all prices align with world market prices. Exceptions are fresh poultry and table eggs, and some bee products, which cannot be imported into New Zealand due to the absence of Import Health Standards (IHS) for these products – the biosecurity standards that products considered to pose a biosecurity risk must meet to be imported. These restrictions result in some market price support (the only form of support to individual commodities in New Zealand), amounting to 15% and 39% of respective gross farm receipts for these commodities in 2019-21, and account for the majority of New Zealand's low producer support. Support for on-farm services, mainly related to animal health and for disaster relief, provides additional minor producer support.

Agricultural policies in New Zealand focus on animal disease control, relief payments in response to natural disasters, and the agricultural knowledge and information system. The government also provides support to community-scale off-farm investments in irrigation systems. Over the past decades, the share of agricultural land under irrigation expanded significantly.

Support for general services (GSSE) equalled just over 2% of the value of agricultural production during 2019-21, well below the OECD average. For most of the past two decades, more than 70% of all support was for general services, with the remainder benefitting producers individually. On average, total support to the sector represented 0.3% of the country's GDP during 2019-21, roughly half the average share across the OECD.

Recent policy changes

Recent policy changes in New Zealand focused on adverse events, and tools and guidance to enhance farm sustainability.

Major adverse events in New Zealand included the drought affecting many parts of the country from summer 2020 to autumn 2021, and the Canterbury floods in May 2021. The government provided NZD 2.8 million and NZD 500 000 as grants, respectively, in addition to NZD 1.07 million for Rural Support Trusts to help primary producers, their families and employees confronted by these and other challenges. Rural Assistance Payments to cover essential living costs also supported farmers in hardship.

The government is working towards an Integrated Farm Planning Framework to enable farmers and growers to incorporate regulated requirements into their farm planning. The "Good Farm Planning Principles: Towards Integrated Farm Planning" guide released in June 2021 provides advice on managing biosecurity, animal welfare, greenhouse gases (GHGs), fresh water and human aspects of farming. It complements a NZD 37 million investment over 2021-2024 for rural advisors equipped with relevant skills, data and information tools.

Government and industry stakeholders co-developed a publicly available farm planning module on intensive winter grazing to provide practical steps for mitigating the effects on fresh water of grazing livestock during winter months.

As part of the Productive and Sustainable Land Use package, the Ministry for Primary Industries (MPI) financed several projects that aim to increase connections between farmers and other stakeholders, such as sector groups, regional councils and science providers.

In late 2021, the He Waka Eke Noa – Primary Sector Climate Action Partnership released a draft document outlining three agricultural emissions pricing options: a farm-level levy and a processor-level hybrid levy, with the New Zealand Emissions Trading Scheme (NZ ETS) presented as the counterfactual option. After consultation with growers and farmers, the Partnership and the independent Climate Change Commission are asked to provide recommendations on emissions pricing systems to ministers in April 2022.

In April 2021, the government announced a ban on the export of livestock by sea which is expected to take effect from 30 April 2023, as a response to animal welfare concerns about the suffering of livestock on ships.

In October 2021, New Zealand and the United Kingdom announced that they had agreed on the key outcomes and parameters for a future Free Trade Agreement (FTA). Elements include market access for agricultural products and co-operation on indigenous trade.

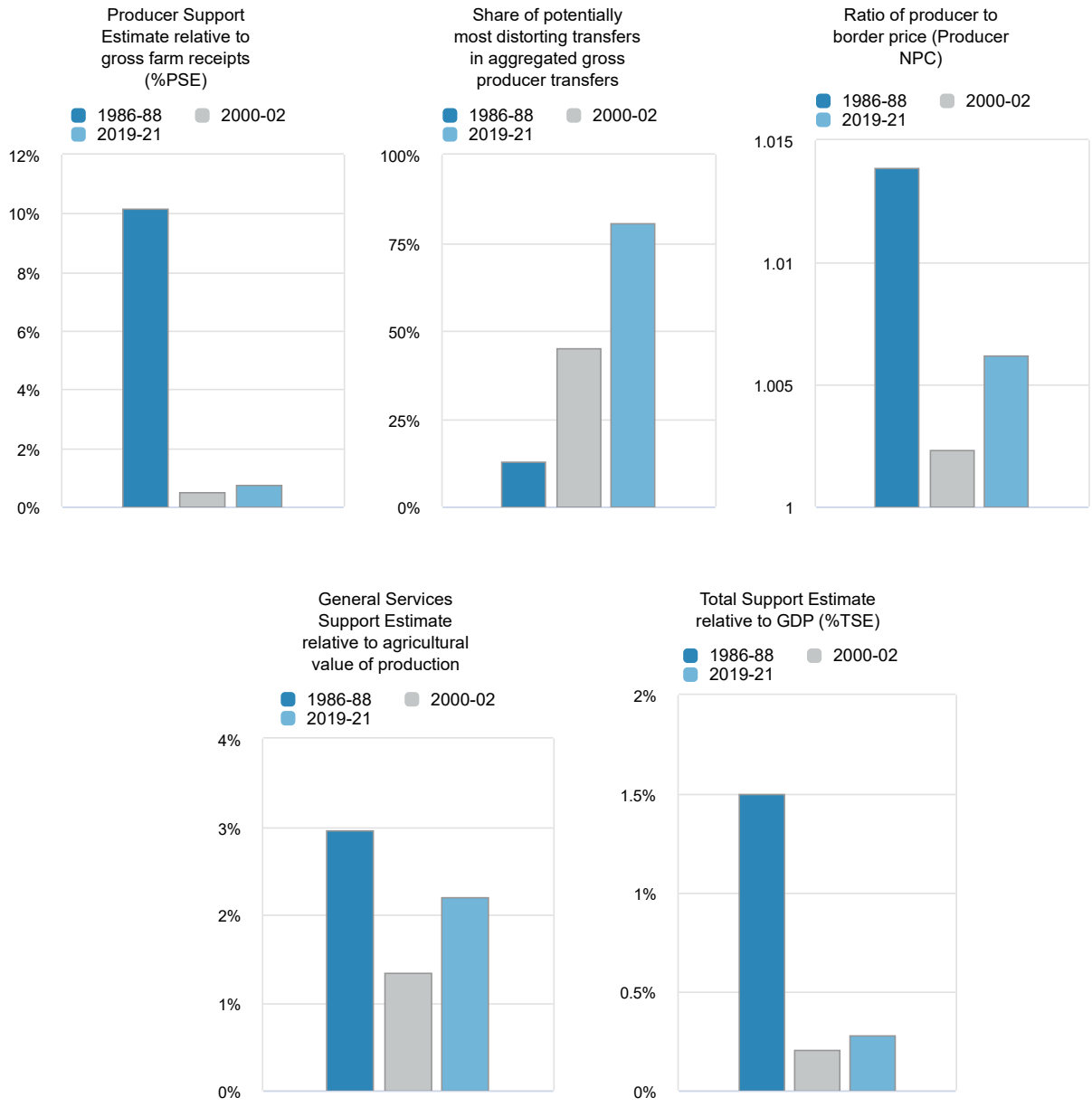
Assessment and recommendations

- Almost half of GHG emissions in New Zealand originate from the agricultural sector. Reducing agricultural emissions is therefore key to achieving New Zealand's mitigation targets. With the passage of the 2019 Zero Carbon Amendment Act and proposed pricing of livestock and fertiliser emissions from 2025, New Zealand was one of the first to bind its climate commitments into law and include objectives for agriculture as an integral component, including medium- and long-term targets for the reduction of bionic methane emissions. Fully including agricultural emissions in New Zealand's Emissions Trading Scheme, or implementing an equivalent way of pricing them, as currently planned, would provide an effective incentive to reduce emissions across the sector.
- Engagement in climate-related research at national and international levels complements planned economic incentives for emission reductions. Given the importance of the beef and dairy sector in national emissions, investments rightly focus on the mitigation of methane emissions.
- New Zealand's open agricultural sector focuses on foreign markets and trade. Its export orientation, underlined by the country's low level of producer support, is buoyed by New Zealand's engagement in a large number of FTAs.
- New Zealand's IHS are key to the country's biosecurity vis-à-vis imported products. While required for all imported products considered to pose a biosecurity risk, some livestock products (including eggs, fresh chicken meat and honey) do not have IHS, meaning that these cannot be imported. While representing a small share of New Zealand's agricultural output, this deprives consumers of lower prices and larger choice. The development of relevant IHS would benefit consumers while ensuring required biosecurity standards.
- Kiwifruit exports to markets other than Australia by entities besides Zespri, the main company, continue to be regulated by requiring authorisation from Kiwifruit New Zealand. New Zealand should aim to change these restrictions as they burden participation in kiwifruit exports by other firms wishing to do so and thus reduce competition and efficiency in kiwifruit trade.
- New Zealand's policy mix focusses on key general services. In addition to pest and disease control, significant investments target the agricultural knowledge and innovation system. This should improve agricultural productivity growth, which has been comparatively low in recent years.

Mandatory funding from private investors often complements public expenditures for general services. This can help to ensure the effective allocation of these investments and that those who benefit from the services contribute to their provision.

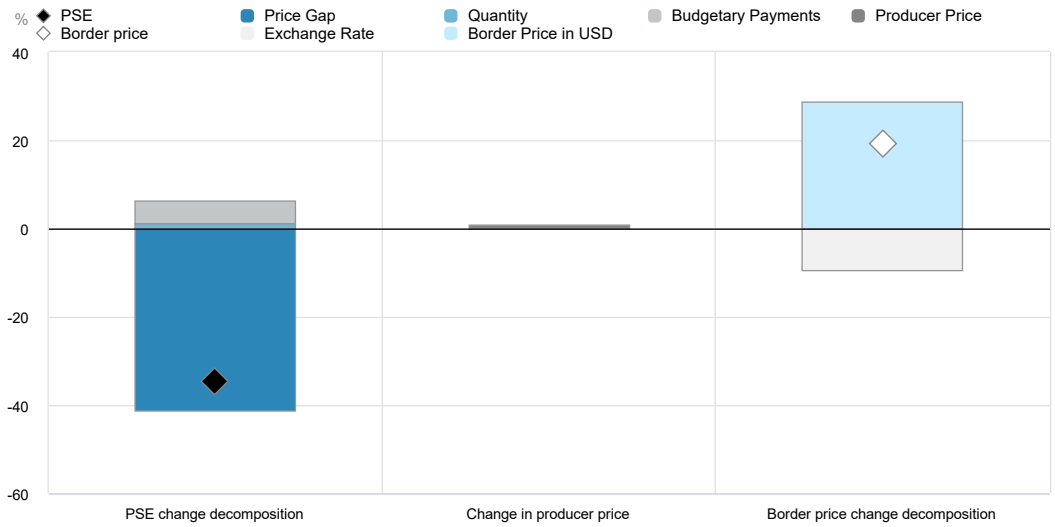
- Available data suggests that New Zealand's agricultural sector faces large and, in the case of nitrogen, increasing nutrient surpluses related to the country's large livestock sector and increased fertiliser use, representing risks to soil, water and air quality. While the 2020 Resource Management Regulations aim to limit agricultural pollution of freshwater ecosystems and could reduce such pressures, this might require greater attention.

Figure 21.1. New Zealand: Development of support to agriculture



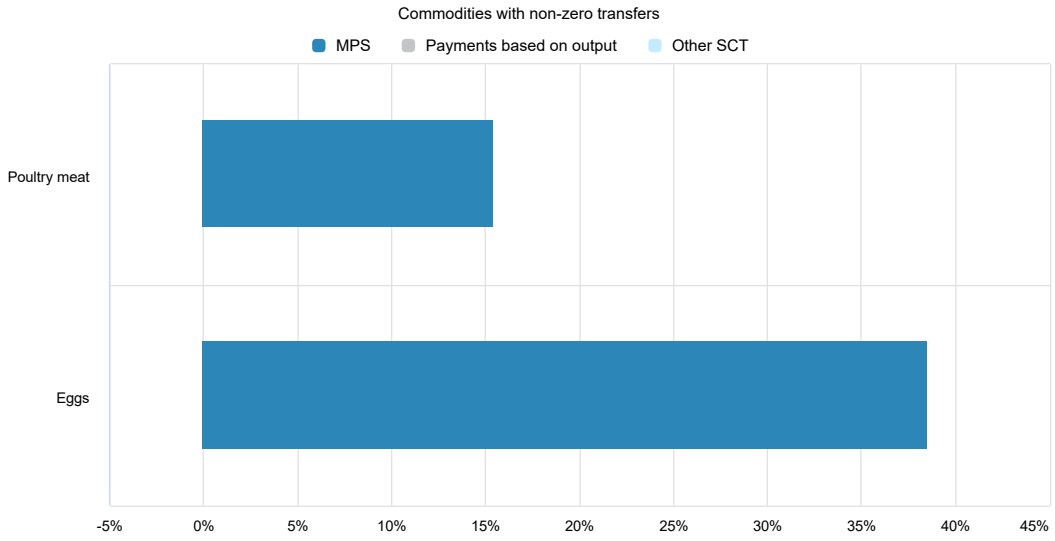
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 21.2. New Zealand: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 21.3. New Zealand: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 21.1. New Zealand: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**4 067**	**6 371**	**20 723**	**19 761**	**20 299**	**22 108**
***of which:** share of MPS commodities (%)*	72.09	73.07	74.83	74.52	74.88	75.08
Total value of consumption (at farm gate)	**1 624**	**2 626**	**10 169**	**10 065**	**9 789**	**10 654**
Producer Support Estimate (PSE)	**424**	**33**	**158**	**134**	**199**	**142**
Support based on commodity output	54	15	127	114	168	97
Market Price Support[1]	53	15	127	114	168	97
Positive Market Price Support	53	15	127	114	168	97
Negative Market Price Support	0	0	0	0	0	0
Payments based on output	1	0	0	0	0	0
Payments based on input use	179	17	29	19	29	39
Based on variable input use	2	0	0	0	0	0
with input constraints	0	0	0	0	0	0
Based on fixed capital formation	154	0	0	0	0	0
with input constraints	0	0	0	0	0	0
Based on on-farm services	23	17	29	19	29	39
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	26	1	2	0	1	6
Based on Receipts / Income	26	1	2	0	1	6
Based on Area planted / Animal numbers	0	0	0	0	0	0
with input constraints	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	165	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**10.16**	**0.52**	**0.77**	**0.68**	**0.98**	**0.64**
Producer NPC (coeff.)	**1.01**	**1.00**	**1.01**	**1.01**	**1.01**	**1.00**
Producer NAC (coeff.)	**1.11**	**1.01**	**1.01**	**1.01**	**1.01**	**1.01**
General Services Support Estimate (GSSE)	**119**	**85**	**454**	**483**	**404**	**476**
Agricultural knowledge and innovation system	60	46	229	244	192	251
Inspection and control	31	28	200	211	187	201
Development and maintenance of infrastructure	27	11	25	27	24	25
Marketing and promotion	0	0	0	0	0	0
Cost of public stockholding	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**20.97**	**71.98**	**72.45**	**78.33**	**64.92**	**74.34**
Consumer Support Estimate (CSE)	**-53**	**-13**	**-107**	**-107**	**-143**	**-72**
Transfers to producers from consumers	-51	-13	-121	-107	-163	-94
Other transfers from consumers	-2	0	0	0	0	0
Transfers to consumers from taxpayers	0	0	14	0	19	23
Excess feed cost	0	0	0	0	0	0
Percentage CSE (%)	**-3.36**	**-0.51**	**-1.07**	**-1.07**	**-1.47**	**-0.67**
Consumer NPC (coeff.)	**1.03**	**1.01**	**1.01**	**1.01**	**1.02**	**1.01**
Consumer NAC (coeff.)	**1.03**	**1.01**	**1.01**	**1.01**	**1.01**	**1.01**
Total Support Estimate (TSE)	**542**	**118**	**626**	**617**	**622**	**640**
Transfers from consumers	53	13	121	107	163	94
Transfers from taxpayers	491	105	505	509	459	546
Budget revenues	-2	0	0	0	0	0
Percentage TSE (% of GDP)	**1.50**	**0.21**	**0.28**	**0.29**	**0.30**	**0.26**
Total Budgetary Support Estimate (TBSE)	**489**	**103**	**500**	**503**	**454**	**543**
Percentage TBSE (% of GDP)	**1.36**	**0.18**	**0.23**	**0.24**	**0.22**	**0.22**
GDP deflator (1986-88=100)	**100**	**138**	**210**	**205**	**209**	**217**
Exchange rate (national currency per USD)	**1.71**	**2.25**	**1.49**	**1.52**	**1.54**	**1.41**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for New Zealand are: wheat, maize, oats, barley, milk, beef and veal, sheep meat, wool, pig meat, poultry and eggs.
Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Prior to the 1970s, New Zealand exported more than half its agricultural production to the United Kingdom, and support for agricultural producers was largely non-existent, with the exception of some import-competing sectors such as eggs and poultry. At the same time, New Zealand's Statutory Marketing Boards, operating since the end of World War I, enjoyed significant rights to regulate supply and trade of several key export products. Overall, relative to the more protected manufacturing sectors, agriculture was implicitly taxed (Anderson et al., 2008[1]).

The accession of the United Kingdom to the European Economic Community in 1973 weakened New Zealand's access to its most important market, and the oil shock of the mid-1970s generated significant foreign exchange shortfalls given the country's dependence on oil imports. In response, the government introduced policy measures to support agricultural production (MPI, 2017[2]). These included input subsidies, minimum prices supported by import barriers and export incentives, tax concessions, low-interest loans and development grants (MPI, 2017[2]; Harris and Rae, 2004[3]).

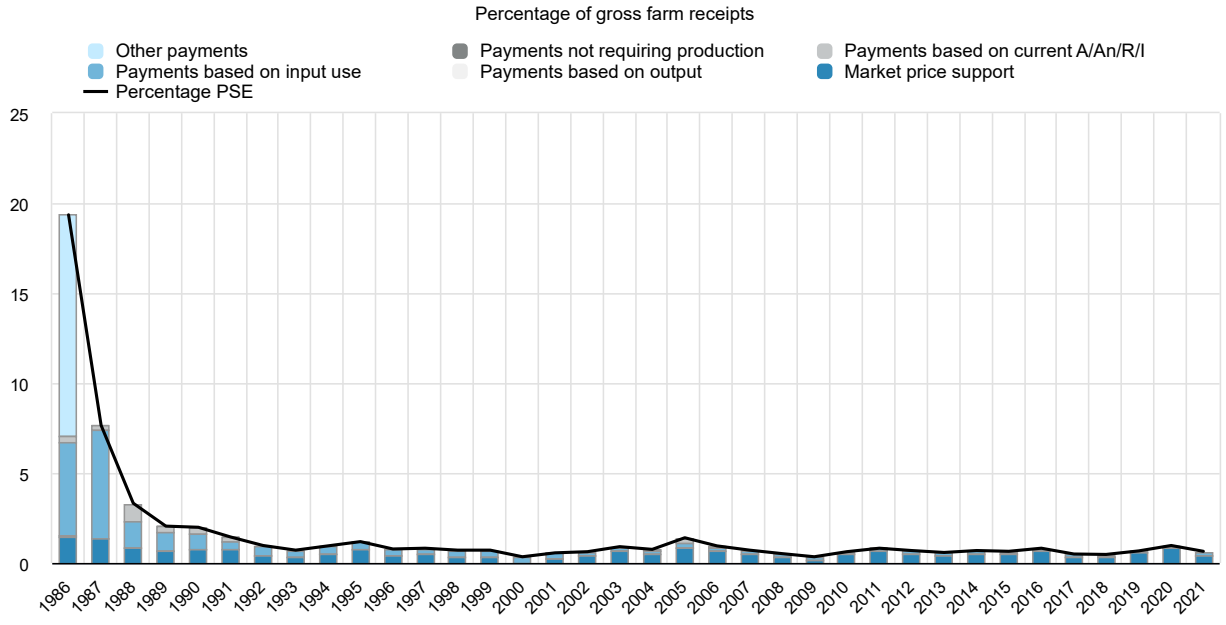
In response to macroeconomic problems, including the substantial fiscal burden of these support measures, a new government implemented significant economic reforms during the second half of the 1980s. By the end of that decade, production and trade distorting policies supporting the farm sector practically disappeared (Table 21.2). In the context of these reforms, New Zealand's Statutory Marketing Boards lost most of their authority or were dissolved (Nayga and Rae, 1993[4]).

Table 21.2. New Zealand: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1975	Export-oriented agriculture with little policy intervention. Implicit taxation notably of exporting agriculture relative to the manufacturing sector	Statutory Marketing Boards with significant authority to regulate production and trade of key export products Agricultural and manufacturing import tariffs Limited farm support, including some input subsidies
1975-1984	Incentivising agricultural production	Introduction of significant farm support measures: price support, input subsidies, tax concessions, low-interest loans, development grants
Late 1980s	Reforms to market and trade liberalisation	Dismantling of price support and most other forms of direct farm support, along with economy-wide reforms liberalising the manufacturing industry as well Restricted function or dismantling of the Statutory Marketing Boards. Exit packages and debt restructuring programmes for farmers who had to stop operating
1990-present	Continuing trade liberalisation	Focus on general services and disaster aid

Since the policy reforms in the late 1980s, New Zealand's level of support to agricultural producers has been the lowest among OECD countries (Figure 21.4). Consequently, for the last three decades, total support to the sector was driven mainly by policies related to general services to agriculture, such as agricultural research and biosecurity controls for pests and diseases.

Figure 21.4. New Zealand: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Agricultural support in New Zealand is limited largely to expenditures on general services, such as agricultural research, and biosecurity controls for pests and diseases. A significant share of the costs of regulatory and operational functions, including for border control, is charged to beneficiaries (e.g. farmers) or those who create risks (e.g. importers).

Practically all of New Zealand's agricultural production and trade is free from economic regulation. Since the phasing out of restrictions on dairy exports directed to specific markets protected by TRQs by the end of 2010, such **export rights** have been allocated to dairy companies based on the proportion of milk-solids collected. **Export regulations** continue to exist for kiwifruit: the New Zealand company Zespri has the default right, although not an exclusive right, to export kiwifruit to all markets other than Australia. Other traders can export kiwifruit to non-Australian markets in collaboration with Zespri, subject to approval by the relevant regulatory body, Kiwifruit New Zealand. Kiwifruit exporters to Australia are required to hold an **export licence** under the **New Zealand Horticulture Export Authority Act 1987,** which provides for multiple exporters to that market.

The 2017 amendments to the **Kiwifruit Export Regulations 1999** allow Zespri shareholders to set rules around maximum shareholding and eligibility for dividend payments; clarify the activities Zespri can undertake as a matter of core business; and enhance the independence and transparency of the industry regulator, Kiwifruit New Zealand.

The **Food Act 2014** came into force on 1 March 2016. Since March 2019, all agro-food business operates under this new law. The Food Act 2014 applies a risk-based approach focused on the outcome of safe and

suitable food, rather than using prescriptive regulation. It aligns the domestic food system with the risk-based approach of other New Zealand food statutes that have more of an export focus, and with international trends in food regulation.

Import Health Standards (IHS) are documents issued under the **Biosecurity Act 1993**. They state the requirements to meet before importing risk goods into New Zealand. Risk goods can be imported only with an IHS in place for the product, and with the product meeting all relevant IHS measures. For some products (table eggs, uncooked chicken meat, honey), no IHS is in place. These products therefore cannot be imported, leading to some market price support as their domestic prices are above the world market level.

"**Industry good**" activities[1] (such as research and development, forming and developing marketing strategies, and providing technical advice) previously undertaken by statutory marketing boards are now managed through producer levy-funded industry organisations under the **Commodity Levies Act 1990**. Under this legislation, levies can only be imposed when supported by producers, and producers themselves decide how to spend the levies. With a limited number of exceptions, levy funds may not be spent on commercial or trading activities. As a provision for accountability to levy payers, the Act requires that levying organisations seek a new mandate to collect levies every six years through a referendum of levy payers held prior to the expiry of their levy orders.

The New Zealand Government engages with industry and stakeholders to build biosecurity readiness and response capability. The **Government Industry Agreement for Biosecurity Readiness and Response (GIA)** established an integrated approach to preparing for and responding to biosecurity risks through voluntary partnerships between the government and primary industry sector groups. Signatories share decision-making, costs and responsibility in preparing for and responding to biosecurity incursions. In 2021, New Zealand Plant Producers Inc. signed the deed. In total, the number of industry groups having joined with the Ministry for Primary Industries under GIA now stands at 22.[2]

Overseer is a tool used for setting and managing nutrients within environmental limits. Overseer estimates nutrient losses from farm systems, helping farmers and growers improve their productivity, reduce nutrients leaching into waterways, and reduce GHG emissions. The intellectual property is jointly owned by the Ministry for Primary Industries, AgResearch Limited, and the Fertiliser Association of New Zealand. Regional councils increasingly use Overseer to implement the National Policy Statement on Freshwater Management.

Sustainable Food and Fibre Futures (SFF Futures) finances projects that create value and improve sustainability in the food and fibre industries. SFF Futures has a budget of NZD 40 million (USD 28 million) per year and provides a single gateway for farmers, growers, harvesters and industry to apply for investment in a range of projects that deliver economic, environmental and social benefits. Projects range from small, one-off initiatives to long-running multi-million dollar partnerships. Community projects require co-investment from the partner organisation of at least 20% of costs. Commercially-driven projects require a co-investment of at least 60% of costs.

The Ministry for Primary Industries' **Productive and Sustainable Land Use** package promotes farm land use practices aimed at improving value creation and environmental outcomes. One part of the programme, **Extension Services**, supports and enables producers to improve environmental, social and wellbeing outcomes in their communities by driving their own solutions. Extension Services emphasises partnering with farmers, regional stakeholders and agricultural professionals to ensure services are relevant to the needs and priorities of local communities. The programme's NZD 35 million (USD 25 million) budget over four years from July 2019 supports up to 2 200 producers across targeted catchments and regions.

The **Māori Agribusiness: Pathway to Increased Productivity (MAPIP)** framework supports Māori primary sector asset owners who seek to sustainably increase the productivity of their primary sector assets, including land, agriculture, horticulture, forestry, and seafood. Introduced in 2015, the MAPIP programme offers a one-on-one approach to achieving primary sector aspirations. The **Māori**

Agribusiness Extension Programme (MABx) additionally enables the Crown to partner with Māori (in a one-to-many approach) to achieve economic, environmental, social and cultural aspirations through sustainable development of primary sector assets. The government committed NZD 12 million (USD 8.5 million) to facilitate MAPIP and MABx projects. Such projects may also be eligible for funding under the SFF futures fund and the Maori Agribusiness workforce skills and training programme (see below).

Although no longer accepting new applications for financial support, **Crown Irrigation Investments Limited (CIIL)** continues to manage three investments under existing contracts: completion of Central Plains Water Stage 2 (Canterbury plains); construction of the Kurow-Duntroon scheme (Kurow, South Canterbury); and construction of the Waimea Community dam (Nelson/Tasman).

The **Essential Freshwater package**, introduced in 2020, contains rules and regulations to stop further degradation of New Zealand's freshwater resources, improve water quality within five years, and restore freshwater ecosystems to a healthy state within a generation. The **Resource Management (National Environmental Standards for Freshwater) Regulations 2020** implement part of the package – and sets requirements for activities posing risks to freshwater and freshwater ecosystems. The standards set minimum requirements for feedlots and other stockholding areas; define requirements for managing intensive winter grazing of forage crops; restrict further agricultural intensification until the end of 2024; set a cap on the application of synthetic nitrogen fertiliser at 190 kilogrammes per hectare; and require reporting of fertiliser use.

The **One Billion Trees programme** aims to double the previous planting rate (including re-planting following harvest and new planting) to plant one billion trees over the decade from 2018-28. The programme is supported both by direct government investment (such as the One Billion Trees Fund and joint ventures between Crown Forestry and private landowners), and adjustments to regulatory settings (such as the Emissions Trading Scheme) to encourage and support tree planting.

The **One Billion Trees Fund** was launched in November 2018 as part of the One Billion Trees programme. The Fund has provided NZD 94 million (USD 66 million) for tree planting grants to landowners including farmers, in order to generate environmental, landscape and productivity benefits. The Fund has also provided NZD 108 million (USD 76 million) for partnership initiatives that underpin successful tree planting. The Fund expired in June 2021 and was not renewed. The government instead decided to establish the New Zealand Forestry Service (see below).

The **Sustainable Land Management Hill Country Erosion Programme (HCEP)** aims to protect New Zealand's estimated 1.4 million hectares of pastoral hill country classified as erosion prone. It funds councils to develop four-year erosion control projects. The government approved a total of NZD 35.3 million (USD 25 million) for the period 2019-23.[3] Selected projects include: the development of whole-farm plans to manage erosion on farms with highly erodible land; the development of agroforestry plans; wide-spaced planting of poplars and willows; land retirement from production to revert to native vegetation; and soil conservation and sustainable land management programmes. Although the main purpose of the HCEP is to reduce erosion, it also aims to reduce sediment loss to waterways, increases on-farm biodiversity, and contributes to the sequestration of carbon in small-scale forests and through planting of poplars and willows.

The National Science Challenges were established in 2014 to tackle New Zealand's biggest science-based issues and opportunities. A core part of the government's investment in science, at just over NZD 680 million (USD 481 million) over ten years, is dedicated to the Challenges. Current projects related to agriculture include the *Deep South Challenge: Changing with our Climate* to enable New Zealanders to adapt, manage risk and thrive in a changing climate; and *Primary Sector Preparedness for Climate Change* to assess the impact of rapid and slow-onset climate changes to the primary sector and evaluate the role and cost of adaptation for resilience.

The Food and Fibre Centre of Vocational Excellence Consortium (Consortium) was appointed in 2020 to establish the prototype **Food and Fibre Centre of Vocational Excellence (Food and Fibre CoVE)** to support better training for New Zealand's primary sector workers. The Consortium is a collaboration of around 54 organisations across the entire food and fibre sector including industry associations, tertiary providers, Māori, employers and employees. The Food and Fibre CoVE is to define vocational excellence and identify and fund specialised projects aimed at building excellence across regions and sectors. It is one of up to three prototype sector-based Centres of Vocational Excellence to be established, with funding of NZD 18 million (USD 12.7 million) committed over up to four years.

The **Overseas Investment Amendment Act 2018**, in force since October 2018, brought residential and lifestyle land under the definition of "sensitive" land. The key change replaced the large farm directive with a broader, rural land directive that applies to all rural land larger than five hectares, other than forestry. As a result, most New Zealand land is now "sensitive", meaning that transactions of such land involving "overseas persons" as defined under the Act require the consent of the Overseas Investment Office. The Amendment Act also places conditions on overseas investors – they must now demonstrate how their investment will benefit the country.

As a trade-dependent economy geographically distant from export markets, New Zealand currently has ten Free Trade Agreements (FTAs) in force, which account for approximately two-thirds both of the value of New Zealand's total exports and of its agro-food exports. Three additional agreements are concluded but not yet in force: the Regional Comprehensive Economic Partnership (RCEP);[4] the New Zealand-Gulf Co-operation Council FTA (involving Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates); and the Anti-Counterfeiting Trade Agreement (ACTA).[5] Negotiations between New Zealand and the countries of the **Pacific Alliance**[6] and negotiations for a **New Zealand-European Union FTA** and a **New Zealand-United Kingdom FTA** are ongoing.

Climate change mitigation policies in agriculture

Primary agriculture is responsible for 48% of New Zealand's gross GHG emissions. This share is large relative to other OECD countries, partly due to the prevalence of agriculture, livestock in particular, in the New Zealand economy, and partly a result of renewable sources' large share of the electricity mix. Most agricultural emissions are methane emissions from dairy, sheep and beef cattle.

In its 2021 Nationally Determined Contribution (NDC) to the Paris Agreement, New Zealand commits to reducing national net GHG emissions by 50% below gross 2005 levels by 2030, an economy-wide target covering, among others, agriculture and other land use sectors. This corresponds to a 41% reduction on a multi-year emissions budget for the 2021-30 period.

The **Zero Carbon Amendment Act 2019** (Zero Carbon Act) sets separate long-term emission reduction targets for long-lived and short-lived GHG emissions, including a target for biogenic methane. In particular, the emissions reduction targets set out in the Zero Carbon Act aim to reduce all GHG emissions, except biogenic methane, to net zero by 2050; and reduce gross biogenic methane emissions 10% below 2017 levels by 2030 and 24-47% by 2050. These targets are considered to be consistent with the Paris Agreement's objective to limit global-warming temperature rise to 1.5°C above pre-industrial levels.

The Zero Carbon Act requires an independent **Climate Change Commission** to advise on setting carbon budgets, and policies to meet them. On 31 May 2021, the Climate Change Commission provided the government with its final advice on the first three emissions budgets (2022-2025, 2026-2030, 2031-2035) and on the proposed policy direction for **New Zealand's first Emissions Reduction Plan (ERP)**. The government is now working to respond to this advice, set the first three emissions budgets, and publish the first ERP by May 2022.

The **New Zealand Emissions Trading Scheme (NZ ETS)** is the main policy tool to reduce GHG emissions. It requires companies in the agricultural supply chain (e.g. meat processors, dairy processors,

nitrogen fertiliser manufacturers and importers) to report their agricultural emissions. However, these companies are not required to pay for their emissions. The NZ ETS also imposes a cost on emissions from transport fuels, electricity production, synthetic GHGs, waste and industrial processes, including in primary sectors.

Reforms legislated in 2020 aimed to increase the ability of the ETS to drive climate change mitigation. The reforms, in combination with a carbon price increase to about NZD 68 (USD 48) per tonne by the end of 2021, which includes forestry emissions, are already increasing the incentive to store carbon in forests and reduce deforestation. The reforms make it easier to participate in the scheme, including for sheep and beef producers whose pastureland could be converted to forest land. This includes introducing into the NZ ETS averaging accounting (which provides more certainty about returns from rotation forestry) and a new category for permanent forestry (replacing the Permanent Forest Sink Initiative). Regulations are in development, expected to come into force on 1 January 2023.

As a tool to reduce GHG emissions, the **He Waka Eke Noa – Primary Sector Climate Action Partnership** between the New Zealand Government, the food and fibre sector and Māori encourages farmers to reduce emissions through available practices. This includes extension and advisory services to give farmers and growers the knowledge and resources to measure, manage and reduce their emissions. Furthermore, investments focus on research and development of mitigation technologies, such as methane inhibitors and a methane vaccine. The partnership aims to implement a framework by 2025 to reduce agricultural greenhouse gas emissions and build the sector's resilience to climate change. This is to be achieved through: (1) measuring, managing and reducing on-farm emissions; (2) recognising, maintaining or increasing integrated carbon sequestration on farms; and (3) adapting to a changing climate. In November 2021, the Partnership released a draft document that outlines three agricultural emissions pricing options, including a farm-level levy, a processor-level hybrid levy, and the NZ ETS presented as the counterfactual option. These pricing options were consulted on nationwide with growers and farmers in February 2022, with feedback informing the He Waka Eke Noa Partnership's policy recommendations to Ministers in April 2022. The independent Climate Change Commission is also asked to provide its own advice to Ministers on the farm-level pricing systems in April 2022.

The New Zealand Government researches and develops mitigation technologies to reduce agricultural GHG emissions. It does so primarily through the **New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC)**, the **Pastoral Greenhouse Gas Research Consortium (PGgRc)**, and in co-ordination with the member countries of the **Global Research Alliance on Agricultural Greenhouse Gases (GRA)**.

The NZAGRC, funded by the Ministry for Primary Industries, brings together nine organisations that conduct research to reduce New Zealand's agricultural GHG emissions.[7] Research focuses on practical ways to reduce on-farm methane and nitrous oxide emissions while improving productivity and sequestering soil carbon. The PGgRc is a partnership funded equally by government and industry, which provides livestock farmers with information and means to mitigate their GHG emissions. The PGgRc focuses on research to reduce methane emissions in ruminant animals. Public funding for the PGgRc ended in August 2021. The PGgRc is expected to focus in the future on commercialising the intellectual property it developed for reducing livestock farmers' GHG emissions.

The GRA was established in 2009. New Zealand hosts the Secretariat and GRA Special Representative, and co-chairs its Livestock Research Group. Through its network of 65 member countries and 25 partner organisations, the GRA contributes to the global discussion, research and science capability for agricultural GHG mitigation by facilitating collaborative and evidence-based dialogue and knowledge sharing. GRA members collaborate on research, development and extension of technologies and practices to deliver more climate-resilient food systems without growing GHG emissions. New Zealand supports GRA scholarship programmes to build science capability in developing countries. These joint initiatives utilise relationships built through the GRA. Other funders of the GRA include the Climate Change, Agriculture

and Food Security programme of the **Consultative Group on International Agricultural Research (CGIAR-CCAFS)** and the **Government of the Netherlands**.

To support the GRA, New Zealand funds international collaborative efforts to accelerate global research in mitigating GHG emissions from agriculture, pastoral livestock farming in particular. The focus is on topics identified by the GRA and relevant to New Zealand's agricultural production systems. Research challenges include manipulating rumen function, reducing nitrous oxide emissions from soils, manipulating rates of soil carbon change, and improving tools and practices for minimising farm-system-level GHG emissions intensity. New Zealand also works on capacity building activities with countries in both South-East Asia and southern and eastern Africa for measuring, reporting, verifying and mitigating agricultural emissions in those countries. New Zealand also co-funds and participates in several international research calls designed to decrease agricultural emissions.

Domestic policy developments in 2021-22

In the year ending June 2021, the government provided NZD 1.07 million (USD 0.76 million) of funding and partnered with a nationwide network of 14 Rural Support Trusts (RSTs) to support primary producers, and their families and employees who experienced challenges. The RSTs used government funding to support people and businesses during and after droughts, floods, hail events and *Mycoplasma bovis* targeting pastoral care, community events and one-on-one support.

One of the main adverse events the government helped people through was the drought that affected many parts of the country from December 2019 to April 2021. Stock feed and water shortages were a particular challenge for the food and fibre sector and rural communities. The effects were worsened by disruptions to supply lines and processing due to the COVID-19 pandemic. Government has spent NZD 2.8 million (USD 2 million) of grants for recovery advice to around 810 farming businesses.

Another major adverse event was the Canterbury floods in May 2021. The government worked closely with Federated Farmers to ensure farmers in the region were supported through this event. Funding of NZD 500 000 (USD 354 000) was made available immediately. This was given to farmers as grants of NZD 3 500 each. A further NZD 4 million (USD 2.8 million) of funding support was announced by the Prime Minister on 24 June 2021.

Other services provided to the rural community in 2021 to assist them in coping with adverse events include: the Farm Business Advice Support Fund, in partnership with the RSTs and the New Zealand Banking Association, which funds farmers to receive financial or business advice from an independent consultant; the Farm Debt Mediation Scheme, which enabled 38 trained and authorised mediators to facilitate 50 mediation sessions for famers and their creditors; and the national stock-feed co-ordination service, which helps farmers forecast and plan their feed and supplementary feed requirements and access supplies of commercial and donated feed.

The **Enhanced Task Force Green** programme was activated as part of the government response to the Canterbury floods. It covers clean up support following adverse events for agriculture farms, forestry, marae and public spaces.

Rural Assistance Payments (RAPs) were made available to be utilised as a result of the 2021 drought. RAPs are only available on case-by-case basis to farmers in significant hardship and cover essential living costs for those farmers' whose income is severely impacted by a medium-scale (or greater) adverse event and who have no other means of supporting their family. For the year ended 30 June 2021 an estimated NZD 177 000 (USD 125 000) was spent on RAPs.

The ten-year programme to eradicate the bacterial infection ***Mycoplasma bovis*** is ongoing with compensation payments to farmers for slaughtered cattle for the year ending June 2021 estimated at NZD 19 million, compared with NZD 54 million the previous year (USD 13.4 million and USD 38.2 million,

respectively), reflecting lower levels but continued infection. The focus for the next 12 months remains on ensuring all infected herds have been found, before the Programme moves to the long-term surveillance phase to prove the absence of the disease. This will involve ongoing optimised bulk tank milk surveillance and on-farm herd testing. In 2017, the Ministry for Primary Industries had declared a biosecurity response after the disease had been found for the first time in New Zealand.

The ***Mycoplasma bovis*** **Recovery Advice Service** helps farmers pay for business and technical advice on recovering from the effects of *Mycoplasma bovis*. The Ministry for Primary Industries makes payments to eligible farmers of up to NZD 5 000 (USD 3 536) per property.

To help farmers and growers balance an increasing number of social, business, economic and regulatory challenges, the government has established an **Integrated Farm Planning Framework** that aims to enable them to incorporate regulated requirements into their farm planning processes. As part of this framework, in June 2021 the government released the guide "Good Farm Planning Principles: Towards Integrated Farm Planning". This guide, co-developed by MPI, industry and councils, defines integrated farm planning and provides advice on managing key areas: biosecurity, animal welfare, greenhouse gases, fresh water and the human elements of farming. The ambition is to facilitate farmers' compliance with the rules and to provide a structured approach for farmers and growers wanting to increase their profits in an environmentally sustainable way.

The guidance complements the NZD 37 million (USD 26 million) investment to be spent over the four years 2021-24 towards MPI delivering 100 additional rural advisers with the right skills, improved data and information tools to drive better on-farm decision making and a fund to help farmers transitioning to an integrated farm planning approach. Overall, the ambition is to ensure New Zealand's farmers and growers are equipped to add value to their farming operations while making the food and fibre sector more sustainable.

To implement the Resource Management (National Environmental Standards for Freshwater) Regulations 2020, a publicly available intensive winter grazing farm planning module was co-developed with relevant government and industry stakeholders as a non-regulatory tool to help farmers manage intensive winter grazing during the 2021 and 2022 grazing seasons, highlighting practical steps farmers can take to mitigate the effects on fresh water of grazing livestock on forage crops during the winter months.

As part of the MPI's Productive and Sustainable Land Use package, 16 projects were funded in the year ending June 2021 totalling NZD 21 million (USD 14.9 million) involving over 4 000 farmers and growers across New Zealand. The funding allows the employment of co-ordinators and to increase the connection and collaboration with sector groups, regional councils, science providers and others to facilitate exchange of experiences and to provide mutual support.

In 2020 the New Zealand Government published its first **National Climate Change Risk** Assessment. This Risk Assessment sets out the priority and significant risks New Zealand faces from the impacts of climate change. The government is now developing a National Adaptation Plan to set out the actions to be taken to address these risks. The Plan is due to be published in August 2022, with public consultation expected in early 2022. Unlike the ERP, the National Adaptation Plan does not have a chapter dedicated to either the agriculture or forestry sector. Rather, agricultural and forestry adaptation measures, policies and strategies are subsumed within the five domains (Natural Environment, Economy, Infrastructure, Communities and Homes, Buildings and Places*)* of the Plan.

Domestic policy responses to the COVID-19 pandemic

MPI's Primary Sector Workforce programme, launched in July 2020, aims to bring 10 000 New Zealanders into work in the food and fibre sector over four years. It focuses on attracting a larger, more diverse talent pool. It seeks to equip New Zealanders with the basic skills and knowledge needed to enter food and fibre sector jobs, helping employers to retain a skilled and productive workforce, supporting skills and labour for

Māori through the He Ara Mahi Hou funding programme and developing a detailed skills database and supply-and-demand model.

In the year ending June 2021, 6 306 people moved into food and fibre sector employment and 764 people graduated from "familiarisation" basic skills courses. The programme is working across the sector with multiple training providers and industry bodies. Examples of the range of training and events that were delivered in the year ending June 2021 include:

- **Familiarisation courses** held through the Taratahi Agricultural Training Centre, Telford – Southern Institute of Technology, New Zealand Kiwifruit Growers Inc, Agri Training, Wine Marlborough and New Zealand Apples and Pears Inc.
- **Hanzon Jobs**, a mentoring programme and mobile app funded by MPI and the Ministry of Social Development supporting new employees entering into agricultural contracting.
- **Primary Industries Good Employer Awards** held by MPI in partnership with the Agricultural and Marketing Research and Development Trust, to highlight good employers and good employment practices across the food and fibre sector, to provide an incentive to employers to strive for good practice, and to change perceptions about employers in the sector.
- **He Ara Mahi Hou**, MPI's Māori Agribusiness Workforce, Skills and Training Programme. Through the programme MPI supported Māori Agribusinesses and land trusts to develop worker redeployment opportunities and to access greater skills training to create sustainable employment for increasing the productivity of their food and fibre sector assets. Projects funded span key sectors, including kiwifruit (Bay of Plenty), forestry (Te Tairāwhiti), dairy (South Taranaki), general food and fibre sector education and training (Taupō), and education, apiculture and remote digital training (Rēkohu/Wharekauri).

Following the initial NZD 30 million (USD 21.2 million) provided to support the delivery of food and welfare assistance by local authorities and Civil Defence Emergency Management Groups during New Zealand's COVID-19 Alert Levels 3 and 4 in 2020, additional support of up to NZD 32 million (USD 22.6 million) was announced in 2021 following the re-emergence of COVID-19 in the community. The funding was used to bolster the organisation of food parcels and provide upfront funding or reimbursement to food banks, community food organisations and other welfare providers.

Trade policy developments in 2021-22

In April 2021, the government announced a ban on the export of livestock by sea following a transitional period of up to two years. The export ban is a response to animal welfare concerns around the suffering of livestock on ships.

Negotiations with Costa Rica, Norway, Fiji and Switzerland for an **Agreement on Climate Change, Trade and Sustainability (ACCTS)** are ongoing. The agreement aims to bring together some of the interrelated elements of the climate change, trade and sustainable development agendas and demonstrate how they can be mutually reinforcing.

In October 2021, New Zealand and the United Kingdom announced that they had agreed on the key outcomes and parameters for a Free Trade Agreement that remains to be concluded. Elements covered include improvements in market access for agricultural products and an indigenous trade chapter providing a platform for co-operation. Agro-food exports to the United Kingdom, and imports from the United Kingdom, have represented about 3% and 2% of New Zealand's total agro-food exports and imports, respectively.

On 10 December 2021, following talks with interested APEC members, New Zealand announced the development of an Indigenous Peoples Economic and Trade Co-operation Arrangement (IPETCA). The IPETCA is a voluntary arrangement that commits economies to deepen indigenous peoples economic and

trade cooperation. A joint decision-making body, the “Partnership Council”, is to enable both economy and indigenous people’s representatives to oversee and implement the arrangement. IPETCA is to come into force once at least four economies have declared their intention to join. New Zealand, Canada, Australia and Chinese Taipei expect to become the foundational members of IPETCA. Membership of IPETCA should be open to any APEC economy or WTO member.

Trade policy responses to the COVID-19 pandemic

In order to maintain some international air connectivity during the pandemic, the government has been providing short term market-led funding for air freight and passenger capacity on a small number of key routes. In March 2021, the existing International Air Freight Capacity scheme was restructured to put greater emphasis on maintaining future tourism linkages and was renamed maintaining international air connectivity (MIAC) to reflect this change in emphasis. All payments for freight services continue to be market led with importers and exporters paying airlines for freight services. Only flights that do not get enough passengers and freight to break even are eligible for support. Between 1 April and 30 October 2021 around NZD 170 million was allocated to support the scheme. The MIAC scheme will continue until the end of March 2022 with up to NZD 195 million available.

Contextual information

New Zealand is a relatively small and sparsely populated country with a per capita GDP that is slightly above the OECD average, but well above the average of all countries covered by the report. It has a high degree of market openness that is related to its high dependency on international trade. Agriculture has a comparatively high, albeit slowly shrinking, importance to the economy, accounting for around 6% of both GDP and employment. Moreover, agro-food products account for more than two-thirds of New Zealand’s total exports.

With little arable land, grass-fed livestock products represent the backbone of the agricultural sector. New Zealand is the world’s largest exporter of sheep meat, and among the largest exporters of dairy products. Beef, fruit and horticultural products also contribute significantly to the country’s agro-food exports.

Table 21.3. New Zealand: Contextual indicators

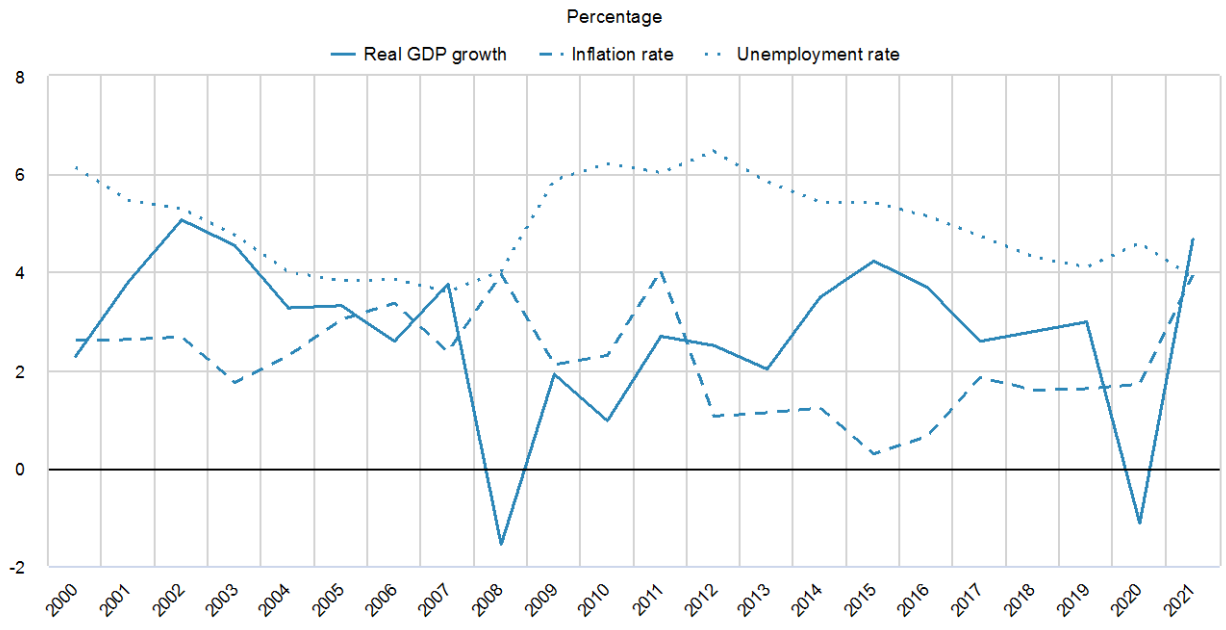
	New Zealand		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	83	225	0.2%	0.2%
Population (million)	4	5	0.1%	0.1%
Land area (thousand km^2)	263	263	0.3%	0.3%
Agricultural area (AA) (thousand ha)	15 413	10 345	0.5%	0.4%
			All countries[1]	
Population density (inhabitants/km^2)	15	19	53	63
GDP per capita (USD in PPPs)	21 472	44 011	9 281	20 929
Trade as % of GDP	25	18	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	8.3	6.2	2.9	4.9
Agriculture share in employment (%)	8.5	6.0	-	-
Agro-food exports (% of total exports)	50.7	69.2	6.2	8.5
Agro-food imports (% of total imports)	7.9	13.4	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	17.7	22.5	-	-
Livestock in total agricultural production (%)	82	78	-	-
Share of arable land in AA (%)	10	5	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

New Zealand has a stable economy having featured robust growth and a relatively low inflation rate for most of the past decade. However, the COVID-19 pandemic and related restrictions caused New Zealand's GDP to fall by 1% in 2020. In 2021, New Zealand's economy rebounded with a growth rate close to 5%, while inflation rose to 3.8%, the highest level in a decade.

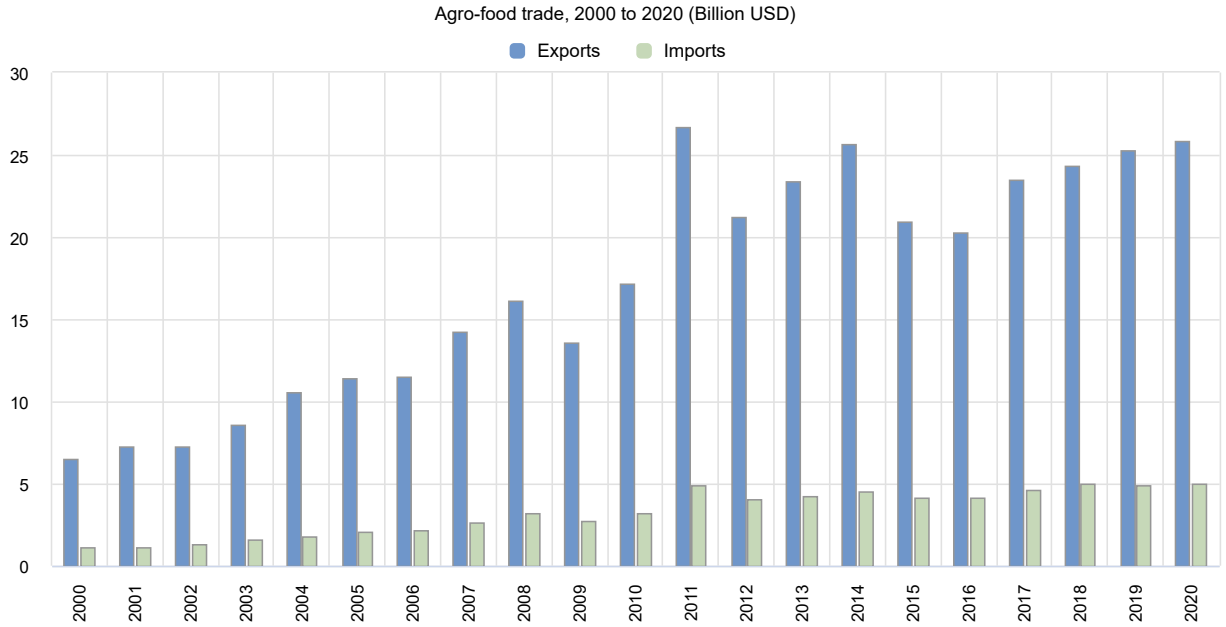
New Zealand is a consistent and growing net exporter of agro-food products, which after some drops in 2015 and 2016 due to, among others, lower dairy prices, have picked up again since 2017. Most of New Zealand's agro-food trade, particularly its exports, is processed food for final consumption. On the import side, however, intermediary products represent two-fifths of the trade basket.

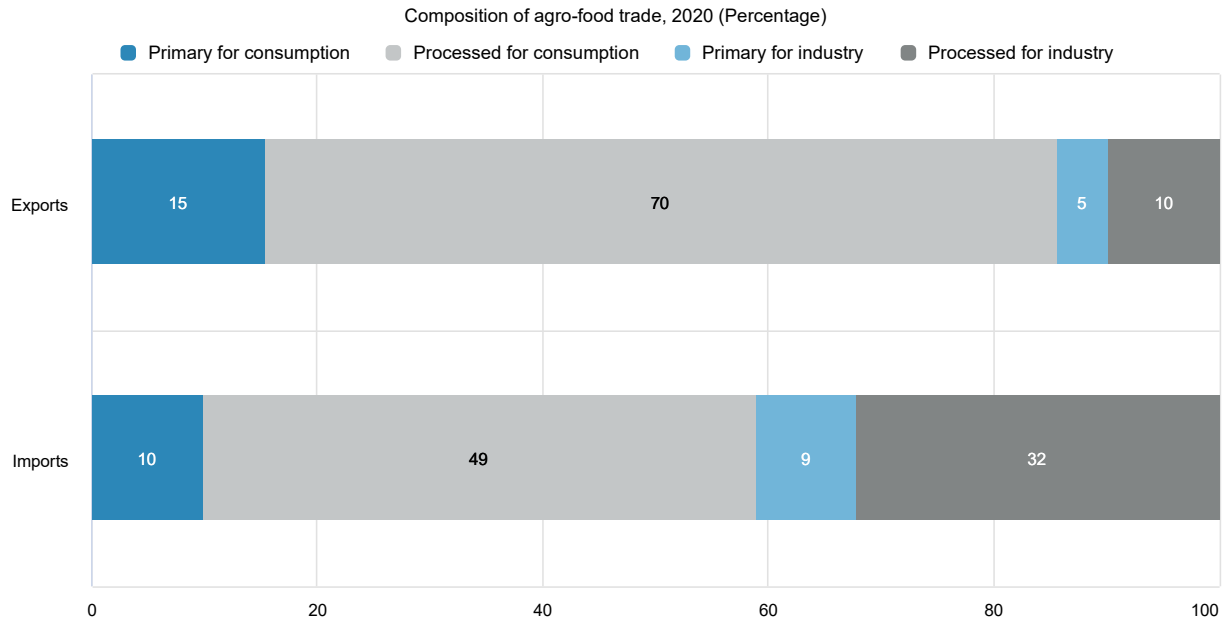
Figure 21.5. New Zealand: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 21.6. New Zealand: Agro-food trade



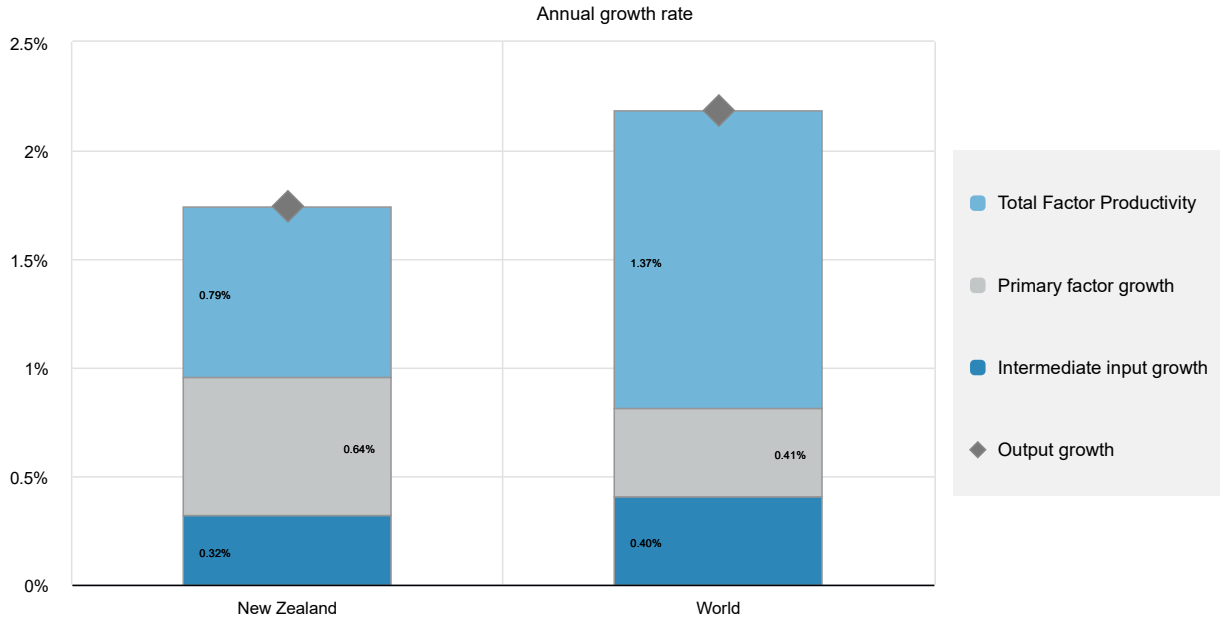


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

New Zealand's growth in agricultural output over the 2010-19 decade has been below the global average, driven by relatively low productivity growth: at 0.8%, the estimated average growth in total factor productivity (TFP) is well below the global average. It is also well below the TFP growth measured for the 1990s.

Given the large share of renewables in electricity generation and the dominant role of dairy and ruminant meat, agriculture is responsible for nearly half of New Zealand's GHG emissions. Almost three-quarters of agricultural emissions are in the form of enteric methane from ruminant livestock. Nutrient surpluses are also well above the respective OECD averages. The sector is also the country's prime consumer of freshwater as irrigated land has expanded, partly in response to climate related uncertainties. Nonetheless, its overall level of water stress, while higher than in the 1990s, is relatively low.

Figure 21.7. New Zealand: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land, livestock and machinery. Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 21.4. New Zealand: Productivity and environmental indicators

	New Zealand		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	3.3%	0.8%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	36.7	66.0	32.1	30.0
Phosphorus balance, kg/ha	13.2	9.6	3.4	2.9
Agriculture share of total energy use (%)	3.5	4.3	1.7	2.0
Agriculture share of GHG emissions (%)	50.0	48.1	8.6	9.7
Share of irrigated land in AA (%)[1]	3.7	7.3	-	-
Share of agriculture in water abstractions (%)	..	61.7	46.3	43.7
Water stress indicator	0.7	2.2	9.7	8.6

Note: * or closest available year.
1. Data are not comparable between time periods due to change in methodology.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Activities "beneficial to the industry, but whose benefits cannot be captured by those who fund or provide the activity", or "long-term investments in the industry made with the expectation of accelerating delivery of better technology and products for the industry" (NZIER, 2007[5]).

[2] Three more industry groups, which have not signed the deed, are represented by other signatories.

[3] The HCEP existed before the One Billion Trees programme but has received significant funding from it.

[4] RCEP comprises the ten countries that make up the Association of South East Asian Nations (ASEAN), Australia, the People's Republic of China (hereafter "China"), India, Japan, Korea and New Zealand.

[5] Other ACTA signatories include Australia, Canada, the European Union and 22 of its Member States, Korea, Japan, Mexico, Morocco, Singapore, and the United States.

[6] Pacific Alliance countries are Chile, Colombia, Mexico and Peru.

[7] The seven member Crown research institutes and universities are: AgResearch, Landcare Research, Lincoln University, Massey University, National Institute of Water and Atmospheric Research, Plant Food Research and Scion. The two other organisations involved are DairyNZ and the Pastoral Greenhouse Gas Research Consortium.

22 Norway

Support to agriculture

Support to agriculture in Norway is among the highest in OECD countries, and consists mainly of forms considered most-distorting of market incentives. Transfers to producers made up the largest share of gross farm receipts in 2019-21 (52%). While high relative to the OECD average, this is down from 69% in 2000-02. Market price support (MPS), mainly through border protection and domestic market regulation, has long been the main component of support to agriculture and affects most major commodities except sheep meat and wool. As a result, producer prices are on average 57% above those at the border – again below historical levels but much higher than the OECD average.

General services support (GSSE) is 4.4% relative to the value of agricultural production. The largest part is for the Norwegian Food Safety Authority and the Norwegian University of Life Sciences. Other areas receiving general support are research, innovation, extension services and infrastructure.

Total support as a share of GDP declined from around 3.5% in the 1980s to less than 1% currently. This reflects the shrinking importance of agriculture as a share of economic activity. Nominal levels of total support are remarkably steady, increasing by an average 1% since 1986-88 (less than inflation).

Recent policy changes

The recently elected government's Hurdal Platform identifies closing the income gap between the agricultural sector and other groups in society as a priority.[1] Specifically, the platform proposes reforming to the milk quota system, a cap on production subsidies, new targets for food self-sufficiency, and reducing the conversion of cultivated land to other uses to a maximum of 200 hectares annually (about 0.02% of cultivated area).

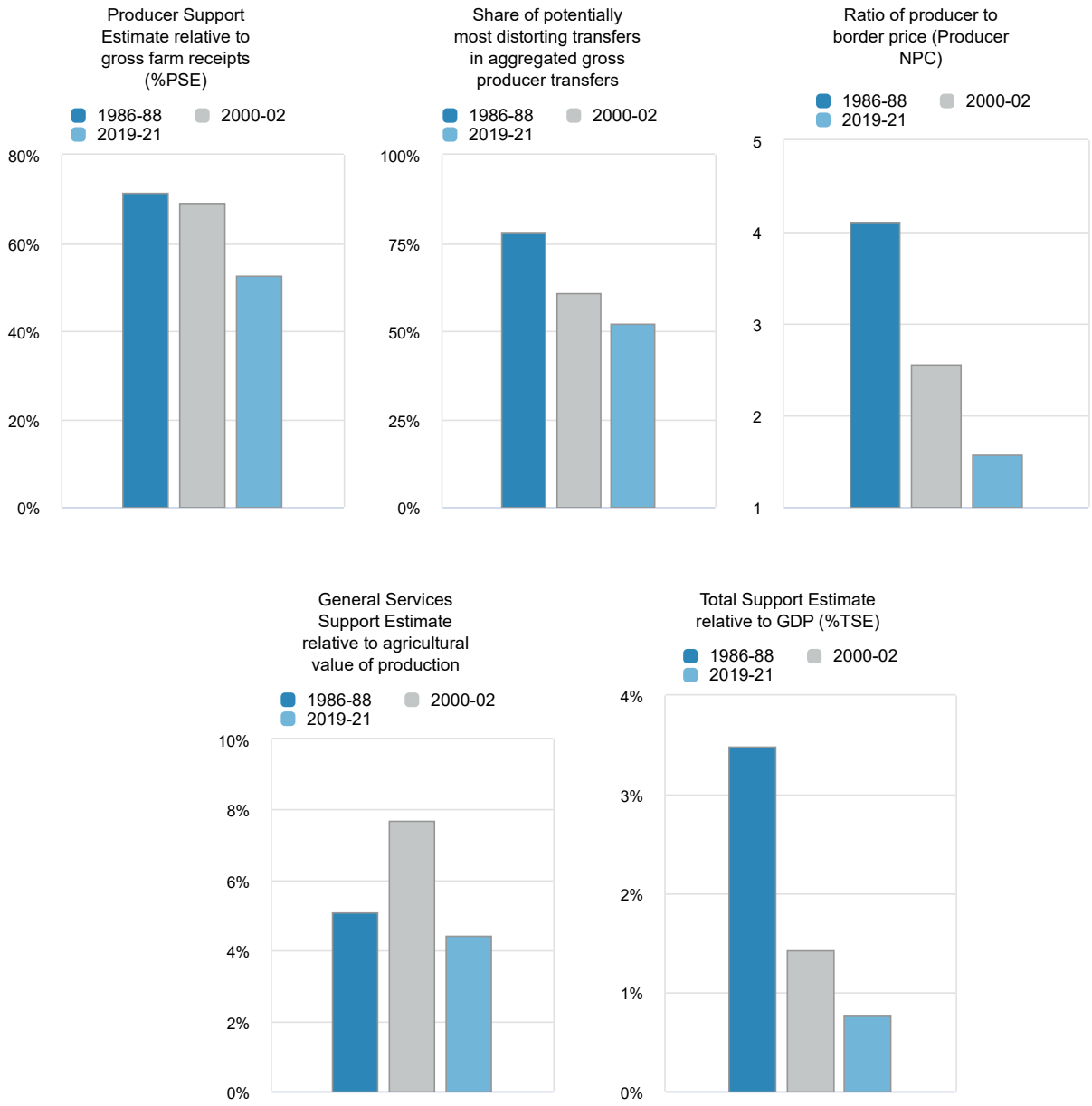
The usual annual negotiations between the government and the two farmers' organisations did not take place. Instead, the government proposed policy settings for agriculture for 2021. The proposal included an increase in target prices, additional budgetary support and more generous agricultural tax deductions. The proposed budget for programmes with positive climate and environmental impact or for rural development is higher. Research is proposed to understand the farm income situation with respect to other sectors.

Assessment and recommendations

- Norway's emissions reduction objectives are ambitious. The country intends to become a low-carbon economy by 2050, reducing greenhouse gas (GHG) emissions by 80–95% from their 1990 level.[2] However, current policies for agricultural emissions reductions make it unlikely the sector will keep pace with others. As other sectors decarbonise, agriculture can be expected to contribute a larger share of total GHG emissions over time. The sector is relatively specialised in ruminant livestock meat and dairy, the most GHG-intensive agricultural commodities.

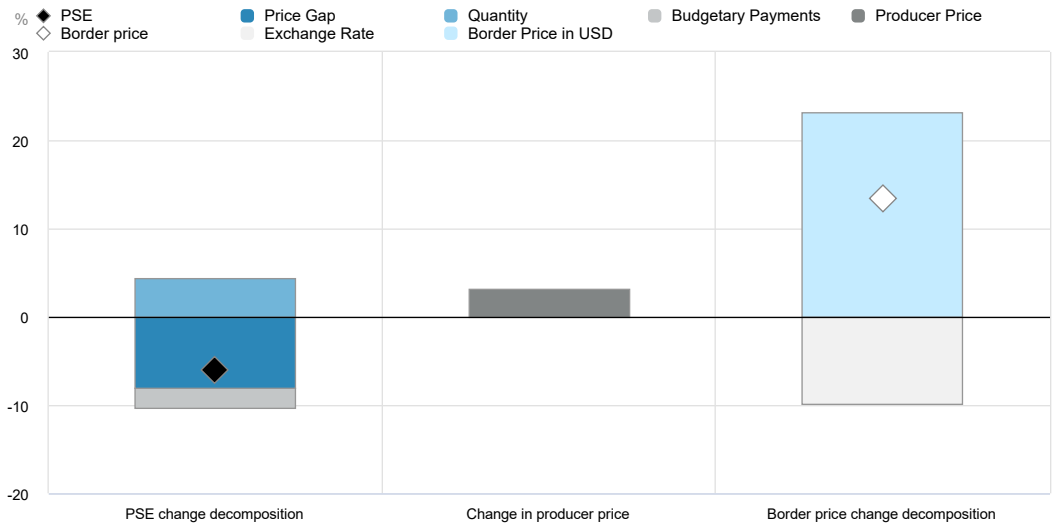
- The voluntary climate agreement between the agriculture sector and the government has modest objectives relative to other sectors. If implemented as planned, it will reduce emissions about 10% by 2030 relative to 1990 levels. While this is less ambitious than other sectors, a quantified emissions reduction commitment in agriculture is an important first step. The government should aim to make this agreement more ambitious provided that options for mitigating GHG emissions from agriculture are cost-effective compared to other sectors. The recent prohibition on cultivating peat bogs is an important step and consideration should be given to advancing this further, such as by rewetting drained areas.
- As a net importer of food, Norway should consider the global carbon footprint of its food consumption together with domestic emissions. Reducing the share of ruminant meat and dairy products in consumers' diets is one of the most effective ways to reduce GHG emissions related to food.
- The framework of negotiations between farmers' associations and the government provides stability and a platform for regular evaluation and gradual adjustment. However, negotiations focus on annual farm incomes to the exclusion of other societal concerns. This can be a barrier to needed reforms, such as responsiveness to markets and focus on agri-environmental outcomes and the provision of ecosystem services.
- The total amount of agricultural land that may be converted to other uses each year is restricted, and the new government intends to tighten these restrictions. While effective at preventing land conversion, this broad-brush approach could be made more targeted and flexible. A better approach would consider the overall contribution of agricultural land as part of local planning and development processes, and integrated with national landscape and biodiversity objectives. This would allow, for example, the consequences for housing costs in those communities experiencing rapidly increasing prices to be evaluated and balanced solutions found.[3]

Figure 22.1. Norway: Development of support to agriculture



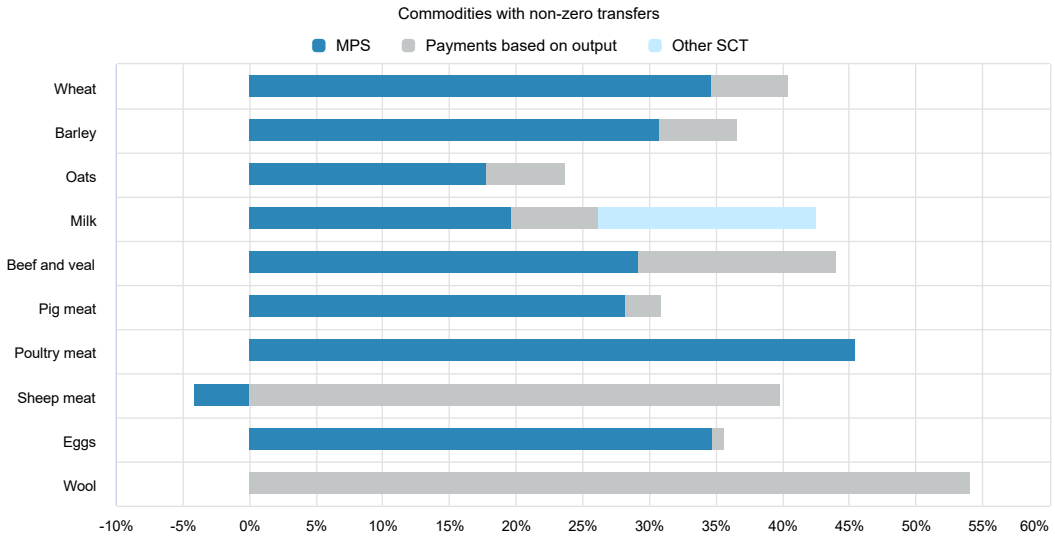
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 22.2. Norway: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 22.3. Norway: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 22.1. Norway: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**2 533**	**2 052**	**3 674**	**3 537**	**3 503**	**3 983**
***of which:** share of MPS commodities (%)*	73.28	80.83	74.22	75.97	73.77	72.91
Total value of consumption (at farm gate)	**2 687**	**2 085**	**3 768**	**3 436**	**3 650**	**4 218**
Producer Support Estimate (PSE)	**2 844**	**2 338**	**2 875**	**2 946**	**2 797**	**2 880**
Support based on commodity output	2 070	1 347	1 401	1 470	1 357	1 376
Market Price Support[1]	1 397	1 009	1 091	1 161	1 062	1 051
Positive Market Price Support	1 397	1 009	1 099	1 177	1 069	1 051
Negative Market Price Support	0	0	-8	-16	-7	-1
Payments based on output	673	337	310	309	295	325
Payments based on input use	250	117	162	191	186	107
Based on variable input use	149	71	90	90	86	95
with input constraints	0	0	0	0	0	0
Based on fixed capital formation	91	38	61	92	91	1
with input constraints	0	0	0	0	0	0
Based on on-farm services	11	8	10	10	10	11
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	524	871	964	941	918	1 033
Based on Receipts / Income	0	49	94	72	100	111
Based on Area planted / Animal numbers	524	822	870	869	818	923
with input constraints	371	644	701	678	666	758
Payments based on non-current A/An/R/I, production required	0	0	343	341	330	358
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	3	5	4	5	6
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	3	5	4	5	6
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**71.44**	**68.99**	**52.71**	**55.36**	**53.40**	**49.56**
Producer NPC (coeff.)	**4.11**	**2.55**	**1.57**	**1.68**	**1.61**	**1.46**
Producer NAC (coeff.)	**3.50**	**3.22**	**2.11**	**2.24**	**2.15**	**1.98**
General Services Support Estimate (GSSE)	**129**	**158**	**163**	**159**	**151**	**180**
Agricultural knowledge and innovation system	74	62	103	104	99	106
Inspection and control	5	25	36	32	29	49
Development and maintenance of infrastructure	29	54	15	15	15	16
Marketing and promotion	21	15	9	9	9	10
Cost of public stockholding	0	2	0	0	0	0
Miscellaneous	0	0	0	0	0	0
Percentage GSSE (% of TSE)	**4.04**	**6.16**	**5.13**	**4.92**	**4.88**	**5.59**
Consumer Support Estimate (CSE)	**-1 388**	**-1 035**	**-1 067**	**-1 102**	**-1 097**	**-1 002**
Transfers to producers from consumers	-1 675	-1 100	-1 133	-1 222	-1 143	-1 035
Other transfers from consumers	-178	-75	-84	-39	-123	-90
Transfers to consumers from taxpayers	220	71	139	121	143	154
Excess feed cost	244	70	11	38	26	-30
Percentage CSE (%)	**-56.34**	**-51.09**	**-29.48**	**-33.23**	**-31.28**	**-24.65**
Consumer NPC (coeff.)	**3.23**	**2.28**	**1.48**	**1.58**	**1.53**	**1.36**
Consumer NAC (coeff.)	**2.29**	**2.04**	**1.42**	**1.50**	**1.46**	**1.33**
Total Support Estimate (TSE)	**3 193**	**2 566**	**3 177**	**3 226**	**3 091**	**3 214**
Transfers from consumers	1 853	1 175	1 218	1 261	1 266	1 126
Transfers from taxpayers	1 518	1 467	2 044	2 004	1 949	2 179
Budget revenues	-178	-75	-84	-39	-123	-90
Percentage TSE (% of GDP)	**3.49**	**1.42**	**0.77**	**0.80**	**0.85**	**0.68**
Total Budgetary Support Estimate (TBSE)	**1 796**	**1 557**	**2 086**	**2 066**	**2 029**	**2 164**
Percentage TBSE (% of GDP)	**1.96**	**0.86**	**0.51**	**0.51**	**0.56**	**0.46**
GDP deflator (1986-88=100)	**100**	**163**	**292**	**285**	**275**	**316**
Exchange rate (national currency per USD)	**6.88**	**8.59**	**8.93**	**8.80**	**9.41**	**8.59**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Norway are: wheat, barley, oats, milk, beef and veal, sheep meat, wool, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Historically, Norway's agricultural policies relate to food security, farm incomes, and regional distribution of production and employment objectives. Today, they also address consumer and societal concerns, including food safety and animal welfare, environmental issues, climate, cultural landscape, innovation, agro-tourism, and small-scale food industry. These are implemented through four pillars: i) border protection; ii) legal frameworks to secure family-owned farms; iii) annual negotiations between the state and farmers' organisations to determine producer prices, budget transfers and allocation of funds; and iv) domestic regulations to balance the market through producer co-operatives. Agricultural support is a component of Norway's regional and rural policies.

Since the mid-1980s there was modest policy reform towards market orientation, and modest reduction in the level of support. Farmers in Norway are heavily supported through border measures, domestic market regulations, budgetary payments and tax breaks.

Prompted by the WTO Uruguay Agreement on Agriculture, in force since 1995, a number of changes were introduced to agricultural policies, to improve cost efficiency and market orientation, including increased flexibility in milk quotas, removal of administered prices for eggs, poultry, beef and sheep, and phasing out of export subsidies. But high levels of protection remain against imports of the most important and sensitive agricultural products, such as meat, dairy, eggs and grains. Moreover, the primary agricultural sector is exempt from standard competition law.

Norwegian agricultural policies are underpinned by the premise that certain environmental public goods are most cost-effectively provided through positive externalities of agricultural commodity production. Environmental cross-compliance was introduced in 1991 and the *Acreage and Cultural Landscape Programme* grants payments on the condition that farmers meet cultural landscape requirements.

Table 22.2. Norway: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1985	Closed economy	High agricultural import tariffs and non-tariff measures Administered prices of agricultural products Production quotas of certain products
1985-1994	Modest domestic reforms	Modest reduction in agricultural import tariffs Removal of several administered prices Increased flexibility in the milk quota system
1995-2000	Implementation of the WTO Uruguay Agreement on Agriculture; more emphasis on environmental sustainability issues	Modest import tariff reduction; tariffication of non-tariff measures Introduction of environmental cross-compliance
2000-present	Continuation of trade reforms	Lower border protection Abolition of export subsidies

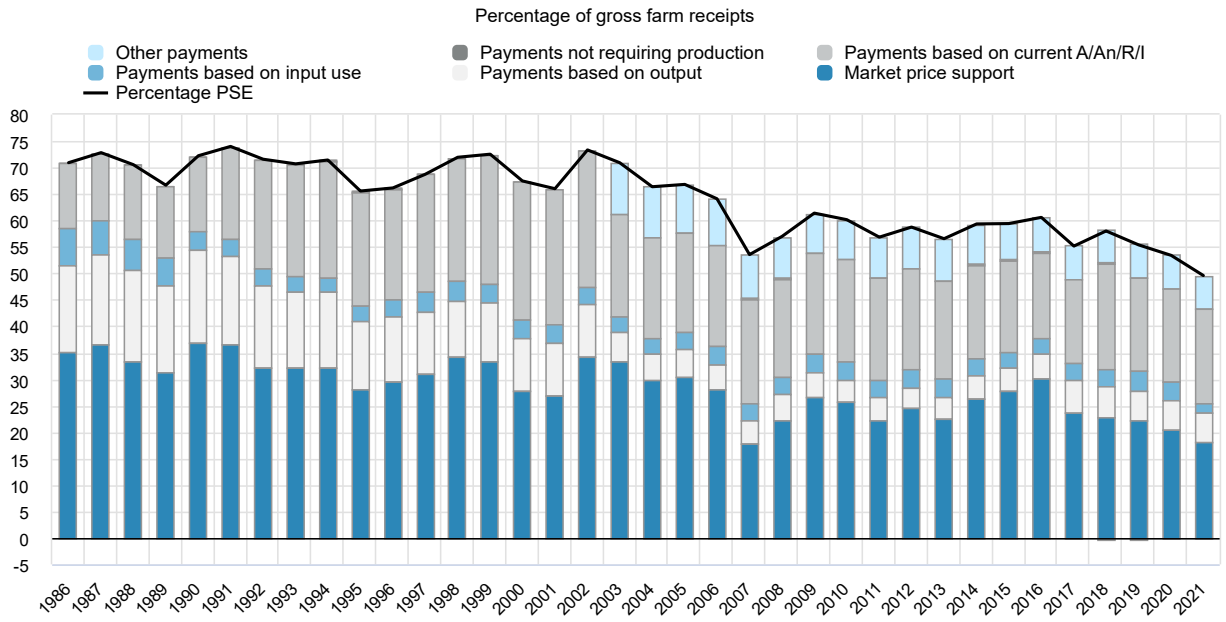
Source: (OECD, 2021[1]).

Agriculture in Norway remains among the most highly protected in the OECD. Market price support, mainly due to border protection and domestic market regulation, is the main component of support to producers (Figure 22.4). The share of MPS in the PSE has been slowly declining over time, but still represents about 36% of support. Payments based on output are now around one-third of 1986-88 levels, whereas payments based on current production factors increased.

Most of Norway's tariff rate quotas (TRQs) were eliminated in 2000 when the WTO bound tariff rates became equal to the in-tariff quota rates. Tariffs for some products, particularly livestock products are set

between 100% and 400% though there is a system of "open periods" for imports at reduced tariff rates when domestic prices rise above threshold levels. Since 1 January 2015, Norway unilaterally eliminated import duties on 114 agricultural tariff lines. While these duties were low (and not important for protecting Norwegian agricultural production), their elimination resulted in reduced customs procedures and administrative costs. Export subsidies were abolished at the end of 2020.

Figure 22.4. Norway: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The strategic objectives of agricultural and food policies, as set out in White Paper No. 11 (2016-17), "Change and development – A future-oriented agricultural production", are: food security; agriculture throughout the country; creating more added value; and sustainable agriculture. Norway also has an objective that Norwegian agriculture has world-leading animal welfare.

The principal policy instruments supporting agriculture include border measures, budgetary payments that are differentiated by commodity and region and domestic market regulation, based on the Marketing Act. The Marketing Act covers certain types of meat (beef, mutton, pork and poultry); milk, butter and cheese; eggs; cereals and oilseeds; potatoes, vegetables, fruit and berries; and fur skins.

Target prices are provided for milk, pork, grains and some fruits and vegetables. The government and farmers' organisations annually negotiate target prices and the budgetary framework for payments to farmers. Marketing fees collected from producers finance marketing activities dealing with surpluses (until 2020 also including export subsidies for livestock products).

A system for buying and selling milk production quotas was put into force in 1997. The milk quota system serves to regulate the milk production in proportion to the market situation, and the quotas are each year multiplied by a factor to fix the amount of milk each producer can deliver to a dairy.

Various direct payments are provided to farmers, including area and headage payments as well as payments based on product quantities (meat). Many of these are differentiated by region and farm size in order to equalise incomes across all types of farms and regions. This is designed to maintain the geographic distribution of farms and production in the country.

Since 2004, agri-environmental measures are implemented as part of the National Environmental Programme *(Nasjonalt miljøprogram)*, which aims to contribute to sustainable agriculture production with reduced greenhouse gas (GHG) emissions, as well as fulfilling Norway's international commitments on environment and climate in the agricultural sector. The most important agri-environmental measures are the Acreage Cultural Landscape Support (*Areal- og kulturlandskapstilskudd*), with an annual budget of NOK 3 647 million (USD 424.5 million), and payments for grazing livestock (*beitetilskudd*), NOK 1 078 million (USD 125.5 million). Other measures include those for organic agriculture, regional environmental programmes for specific agri-environmental measures, schemes for supporting cultural and natural values and reducing pollution in the agricultural landscape, Special Environmental Measures In Agriculture (*Spesielle Miljøtiltak I jordbruket*) and organised grazing measures (*Tiltak I beiteområder*). Environmental levies are applied on agricultural pesticides.

The *Selected cultural landscapes in agriculture* (*Utvalgte kulturlandskap I jordbruket, UKL*) initiative supports farmers who want to make an extra effort to care for the environmental values of cultural landscape in 46 selected areas with important or exceptional cultural landscapes. The investment is based on voluntary agreements between the state and the landowners. Co-ordination of these cultural landscapes nationally is the responsibility of the Norwegian Directorate of Agriculture, in collaboration with the Norwegian Environment Agency and the National Heritage Board. Each of the selected areas is co-managed by the municipality, landowners and agricultural enterprises, in collaboration with regional agricultural, natural and cultural heritage management. The initiative has a budget of NOK 38 million (USD 4.4 million) in 2022.

The *Regional Environmental Programme* includes payments to reduce water pollution from agricultural fields, environmentally-friendly spreading of manure, mowing small (abandoned) fields with high or special biodiversity in forest and mountain areas, grazing on islands, maintenance around heritage sites in the agricultural landscape, etc.

In 2016, the government published the national strategy on bio-economy. This was a broad cross-sectoral strategy developed by eight ministries, including the Norwegian Ministry of Agriculture and Food. The strategy has three overarching objectives – increased value creation, reduced GHG emissions, and increased resource use efficiency and sustainability – and four focus areas: i) co-operation across sectors, industries and thematic areas; ii) markets for renewable bio-based products; iii) efficient use and profitable processing of renewable biological resources; and iv) sustainable production and extraction of renewable biological resources.

Article 19 of the European Economic Area (EEA) Agreement concerning trade in basic agricultural products is reviewed periodically. The last round of these reviews was finalised in April 2017 and changes agreed entered into force in October 2018. Under the EEA, TRQs expanded on several products, including meat, cheese, vegetables and certain products used in the food industry for making processed agricultural goods. Through the European Free Trade Association (EFTA), Norway has negotiated 29 free trade agreements (FTAs) with 40 partner countries. All agreements include agricultural products. About 10% of all trade is covered by FTA, with average tariffs low outside the agriculture sector. For agricultural products, simple average MFN applied tariffs were 37.1% and bound tariffs were 143.1% in 2017.

Regarding measures related to animal welfare, there is a ban on routine prophylactic use of antibiotics and the use of antibiotics as growth promoters in animal feed. Veterinary services are provided in the whole country to ensure all animals have access to treatment. Investments to promote animal welfare are given priority in the ordinary investment programme for agriculture.

Climate change mitigation policies in agriculture

Agricultural emissions, mostly due to enteric fermentation by livestock, accounted for 8.8% (4.4 $MtCO_2eq$) of total GHG emissions in 2019, up from 8.2% (4.5 $MtCO_2eq$) in 2005. In addition, emissions from fossil fuel consumed by agriculture and forestry were 1% (0.534 $MtCO_2$) and annual soil carbon losses from agricultural land were 5% (2.4 $MtCO_2$).

The 2017 Climate Change Act establishes Norway's targets to reduce emissions by 2030 and become a low-emission society by 2050. Norway signed and ratified the Paris Agreement and a bilateral agreement with the European Union under which it commits to reducing GHG emissions by 2030 by 50-55% of 1990 levels. There is no specific reduction commitment for agriculture, but the government has an agreement with the sector (see below). Carbon dioxide emissions from fossil fuel use in agriculture are subject to a carbon dioxide tax like for other sectors. Other GHG emissions from agriculture are not subject to such taxation nor are they included in the European Emission Trading System (ETS). Instead, regulatory, financial and advisory measures aim to reduce GHG emissions from agriculture.

In October 2019, the European Union, Iceland and Norway agreed to extend their climate co-operation for 2021-30 through the EEA Agreement by including the Effort Sharing Regulation and the regulation on GHG emissions and removals from land use, land use change and forestry (the LULUCF-Regulation). According to the agreement, Norway will fulfil the GHG reduction target in its Nationally Determined Contribution for 1 January 2021 to 31 December 2030 in accordance with the Emissions Trading System Directive (which does not include agriculture), LULUCF-Regulation (which calls for no net gains in emissions from LULUCF) and the Effort Sharing Regulation (which has to do with domestic reduction commitments).

The government and farmers' organisations negotiated a climate agreement for agriculture in June 2019. The deal sets targets for abatement of GHG emissions and removals from agriculture over 2021-30. The parties undertake to reduce emissions and enhance removals by a total of 5 $MtCO_2eq$ in the ten-year period. The plan has eight focus areas:[4]

1. Deployment of a climate calculator and increased investment in climate advice. By the end of the plan, all farms should be using the climate calculator and have been offered climate advice.
2. Targeted efforts to improve roughage quality and use of feed additives, livestock breeding in cattle, sheep and pigs, and improved animal health.
3. Adoption of machinery that runs on electricity, biofuels, biogas or hydrogen.
4. Adoption of fossil-free heating sources.
5. Better use of fertilisers through more environmentally friendly spreading methods, better storage capacity and timing.
6. Increased use of livestock manure for biogas production to reduce GHG emissions in agriculture and other sectors.
7. Use of cover crops, biocarbon and grazing to remove carbon from the atmosphere and store it in plant biomass and soil.
8. Development and application of new technologies that reduce GHG emissions and increase carbon storage.

The climate agreement between the agricultural organisations and the government will be the basis for climate-related work in this sector in the years ahead. The most important role for agriculture in the context

of climate change is to reduce emissions per unit produced, increase the uptake of CO_2 and adapt to a changing climate.

GHG emissions from agriculture include methane associated with animal husbandry and nitrous oxide (N_2O) associated with nitrogen fertilisation. Such emissions are difficult to measure, and not covered by the emissions trading system or subject to GHG taxation. The emissions also derive from many small sources, making it difficult to include them in an emission trading system. For this reason, efforts concentrate on the eight focus areas described above. Regulations for manure and fertiliser management are in place to control emissions from these sources. The cultivation of peat bogs was restricted to prevent additional emissions from such soils. As of 2025, agricultural buildings will be prohibited from using fossil fuels for heating (this ban is in effect for other building types as of 2020).

The Climate and Environmental Programme (Klima- og miljøprogrammet) produces reports and develops practical knowledge for farmers on environment- and climate-friendly practices in agriculture not addressed in national schemes.

Domestic policy developments in 2021-22

After the parliamentary elections held in September 2021, the new government has written "the Hurdal Platform" as the basis for their policies.[5] The platform does not represent a radical shift from past policies, but identifies a number of new areas of emphasis. Among other things, the government states that it will:

- Close the income gap between the agriculture sector and other groups in society.
- Lower the quota for cow's milk production to 500 000 litres, reduce quota costs and reduce the use of rented quota.
- Cap subsidy levels for all commodities.
- Set a target for food self-sufficiency, corrected for imports of raw materials for feed, of 50%.
- Reduce the annual target for redevelopment of cultivated land to a maximum of 200 hectares annually.

The usual annual negotiations between the government and the two farmers' organisations did not take place in 2020. As a consequence, the government proposed the following for 2021 to the Storting (parliament), which was adopted as the new agricultural agreement:

- An increase in target prices with an effect on revenue of about NOK 400 million (USD 46.6 million) from 1 July 2021.
- An increase in budgetary support of NOK 490 million (USD 57 million) from 2021 to 2022.
- Transfer of budgetary support from the 2021 budget to the 2022 budget of NOK 32 million (USD 3.7 million).
- Increased value of the agricultural deduction of taxable income of NOK 40 million (USD 4.7 million) from 2021 to 2022.
- Stimulation of income opportunities in sectors with market potential such as cereals, fruits, vegetables and potatoes.
- Further increase in subsidies for schemes that have a positive climate- and environmental impact by NOK 238 million (USD 27.7 million) from 2021 to 2022.
- Allocate funds for rural development amounting to NOK 1 296 million (USD 150.8 million).
- Further strengthen small and medium-sized farms.
- Establish a committee to discuss and clarify principles and methods, as well as opportunities and restrictions, for measuring income for agriculture as a sector and for farmers as self-employed, as well as the basis and assumptions for comparing business income with wages for workers.

For the quota year starting 1 January 2022 and ending 31 December 2022, milk quotas are multiplied by a factor of 0.99 to find the actual production possibilities. The milk production forecast in 2022 is 1 472 million litres.

The ordinary quota scheme for milk was reintroduced in the market as from 2022. Farmers selling cow milk quota are allowed to sell up to 60% directly to other producers within a production region (mainly defined as the county) without restrictions on price. At least 40% of the sale must be to the government at a fixed price. There are 14 production regions for cow milk. These regions are designed to ensure good geographical distribution, cost-effective food production and equal economic opportunities for producers in all regions.

In 2021, the work on organic production was aimed to follow up on the strategy on organic production that was passed in 2018. The government's goal was that the production of organic products should be stimulated to meet the market demands. The strategy has three focus areas: knowledge and competences, support organic production and the development of an efficient value chain. A programme to set goals and help prioritise measures for organic production, was established in 2019, and is now being followed up. In 2021, NOK 36 million (USD 4.2 million) were used on development measures and NOK 120 million (USD 14 million) on measures to support organic production.

Domestic policy responses to the COVID-19 pandemic

A crop failure compensation scheme established in 2020 was temporarily expanded so that farmers experiencing harvest failures in both 2020 and 2021 due to a lack of seasonal labour, could apply for compensation. Farmers who have been unable to harvest due to lack of seasonal workers, are eligible for payment under the scheme. This measure applied to farmers of fruits, berries, vegetables or potatoes. Compensation up to NOK 2 million (USD 200 000) could be approved for significant crop failures of more than 30% compared to the average production over a five-year reference period.

In 2021, a temporary scheme was introduced for subsidies in the training of employees in seasonal work in the agricultural sector. The scheme is to help producers to recruit Norwegian labour to replace foreign labour that was unavailable because of entry restrictions.

To respond to changed market conditions, funds have been provided in 2021 to restructure companies involved with local food production and tourism (e.g. to website development and new marketing channels). These funds were provided through the development programme for agricultural growth and value creation.

Trade policy developments in 2021-22

The most recent new FTA agreement was with Indonesia, which entered into force on 1 November 2021. Further, an updated bilateral agreement on agriculture between Norway and Israel entered into force on 1 August 2021. There are ongoing free trade negotiations between EFTA and Moldova, Viet Nam, India and Malaysia. The negotiations with Mercosur were concluded in substance in 2019. EFTA has started renegotiations of free trade agreements with Chile, the Palestinian Authority and the South African Customs Union. The People's Republic of China and Norway have had further progress in the bilateral negotiations on a trade agreement in 2021. Following the United Kingdom leaving the European Union, the EEA EFTA States negotiated a trade agreement with the United Kingdom in 2021, including bilateral concessions on agriculture. This agreement entered into force on 1 December 2021.

According to the WTO Ministerial Decision on agriculture in Nairobi in December 2015, Norway eliminated its remaining export subsidies on cheese and processed agricultural products as of the end of 2020. As of 1 January 2021, Norway applies no export subsidies.

Contextual information

Norway has a small and open economy with a substantial petroleum sector. At USD 63 237 per capita in 2021, Norway has one of the highest GDP per capita rates in the world (Table 22.3). While labour force participation has weakened somewhat over the past two decades, Norway's employment rate is still above the OECD average. Norway has been more successful than many countries in limiting the spread and impact of COVID-19. The country has maintained good outcomes on many economic and social indicators. After Iceland, Norway has the second lowest population density in Europe.

Norway is a northern European country with a large coastline of nearly 29 000 km, including fjords and bays. Farmland accounts for only 3% of the mainland land mass. Climatic conditions allow for production of only a narrow range of commodities. In addition to sheep farming, the primary activity has traditionally been cattle (for milk and meat) and cereals (mainly used as animal feed). The farm structure is dominated by relatively small family farms, many of which are in remote locations.

Table 22.3. Norway: Contextual indicators

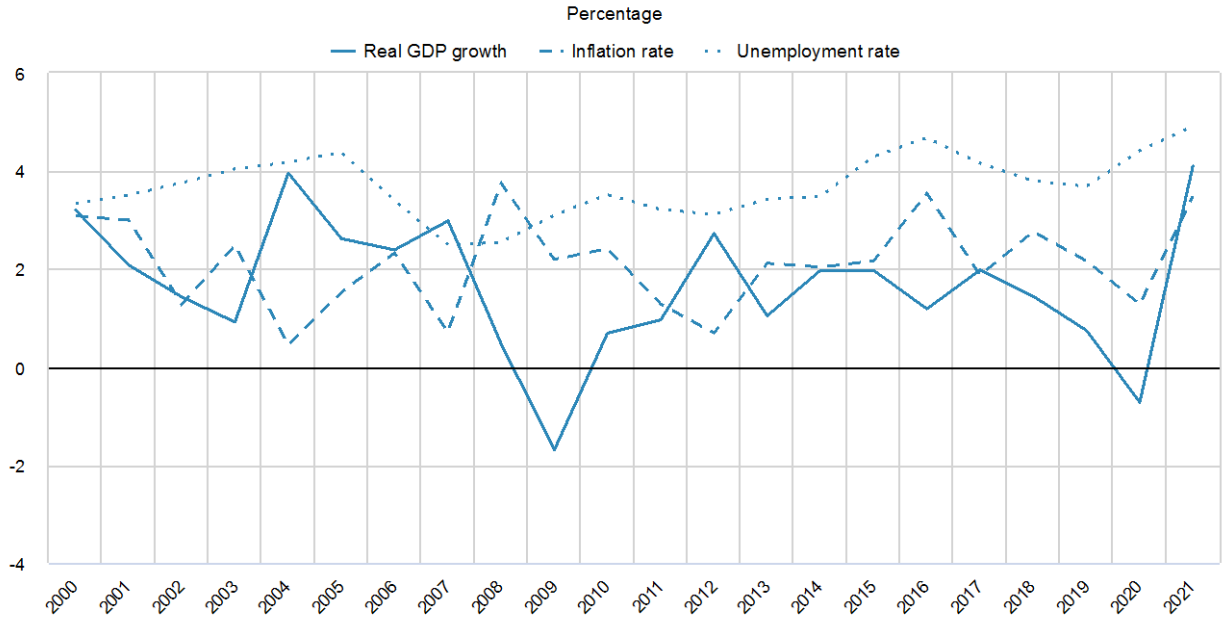
	Norway		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	166	340	0.4%	0.3%
Population (million)	4	5	0.1%	0.1%
Land area (thousand km^2)	365	365	0.4%	0.4%
Agricultural area (AA) (thousand ha)	1 042	982	0.03%	0.03%
			All countries[1]	
Population density (inhabitants/km^2)	14	17	53	63
GDP per capita (USD in PPPs)	36 952	63 237	9 281	20 929
Trade as % of GDP	28	23	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	2.1	2.0	2.9	4.9
Agriculture share in employment (%)	4.1	2.1	-	-
Agro-food exports (% of total exports)	0.8	1.5	6.2	8.5
Agro-food imports (% of total imports)	5.6	10.3	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	29	30	-	-
Livestock in total agricultural production (%)	71	70	-	-
Share of arable land in AA (%)	84	81	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Norway has been recovering comparatively quickly from the economic impacts of the global pandemic. Mainland gross domestic product (GDP) annual growth increased by 4.1% in 2021. Norway continues to achieve good outcomes on many economic and social dimensions. GDP per capita remains among the highest in the OECD. Also, the country is broadly successful in its prioritisation of low inequality and the universal provision of core public services, including health and education. The gap between the highest and lowest incomes is among the smallest in the OECD area and rates of poverty are low (OECD, 2022[2]).

Strong headline consumer price inflation in recent quarters has been driven by large electricity price increases. Global supply bottlenecks in computer chips, lumber and shipping are also putting pressure on inflation (Figure 22.5). Housing in Norwegian cities has become still more expensive with a new surge in prices during the pandemic (OECD, 2022[2]).

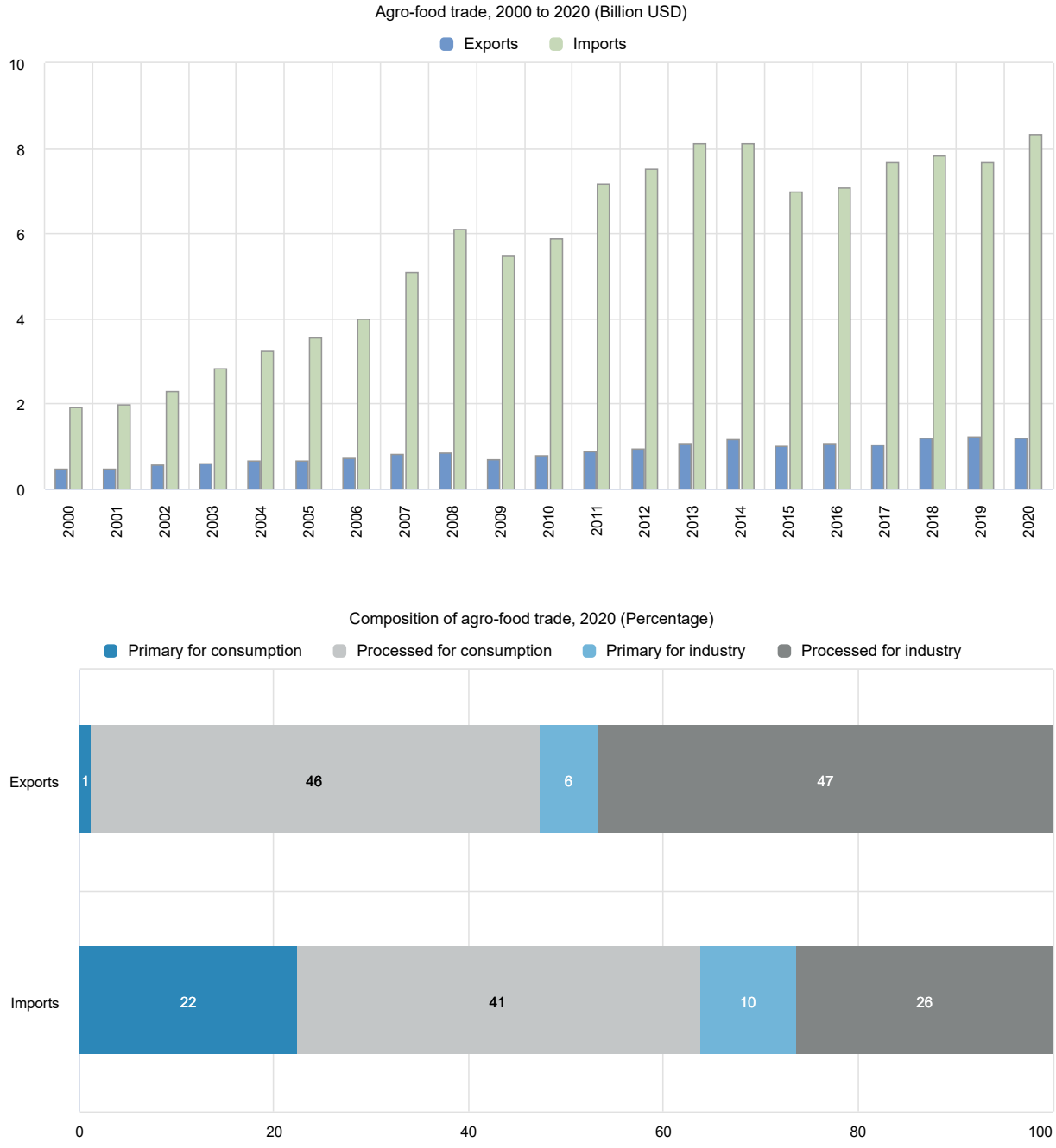
Figure 22.5. Norway: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Norway is a net importer of agricultural products (excluding fish). Agro-food imports represent around 9% of total imports, while agro-food exports represent 1.2% of total exports. The European Union is Norway's main trading partner, accounting for about two-thirds of both imports and exports. Within the European Union, Sweden and Denmark together account for one-third of Norwegian agro-food exports, whereas imports are more broadly sourced. Outside the European Union, the United States and Japan are important export destinations and Brazil and the Russian Federation are together the source of 13% of imports. Agro-food trade has been growing steadily, if more slowly after 2013 (Figure 22.6). Most agro-food exports are in products for final consumption, while a small majority of imports are for further processing.

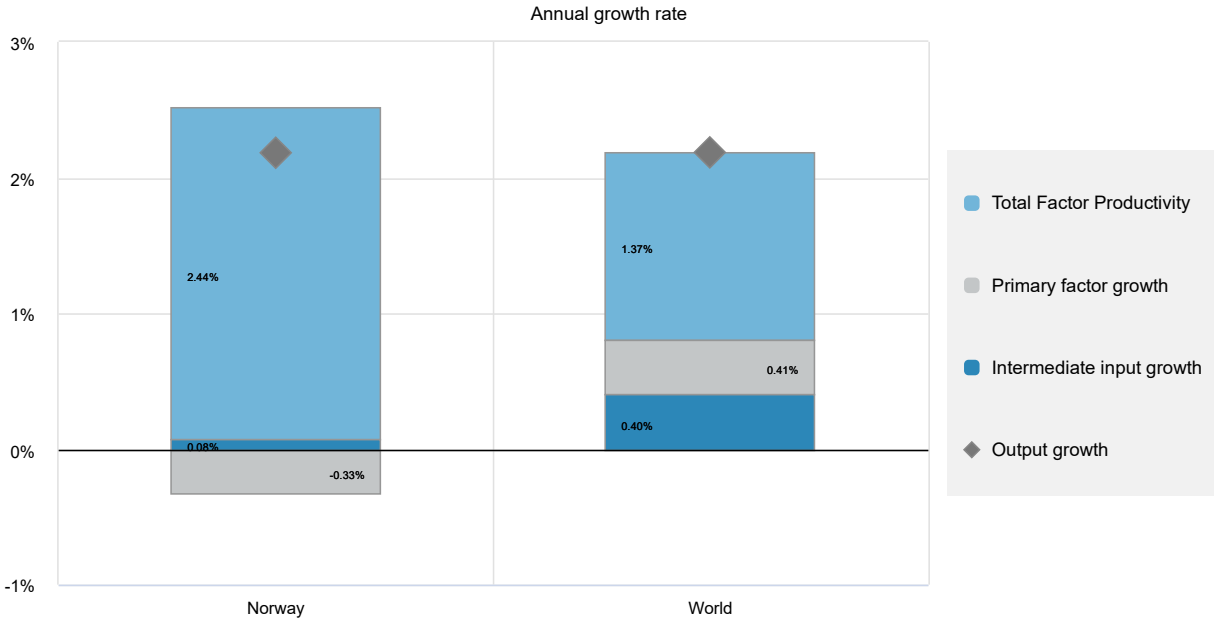
Figure 22.6. Norway: Agro-food trade



Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

After a period of stagnant total production and total factor productivity (TFP) growth through the 1990s, Norwegian agriculture (including aquaculture) has experienced some of the highest annual TFP growth in the OECD, at an average annual rate of 2.44% in the 2010-19 period.[6] This is on par with the G20 average and well above the Nordic and OECD averages (1.6% and 1.4%) (OECD, 2021[1]). Total agricultural output has increased while the use of labour and machinery inputs has declined (Figure 22.7).

Figure 22.7. Norway: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Nitrogen and phosphorus balances in Norway are about three times the OECD average. 34% of all nitrogen (N) and 58% of all phosphorus (P), measured by nutrient content, come from manure (OECD, 2021[1]). Energy use in agriculture is about 1.5% of the total in Norway, below its share of GDP. Agriculture accounts for 8.8% of total GHG emissions, slightly below the OECD average. Agricultural emissions are mainly connected to animals, in particular from ruminant enteric fermentation and manure management. The size of dairy and beef herds, the way they are fed, manure management practices, and the amount of N fertiliser applied to fields are the main drivers of the volume of GHG emissions (OECD, 2021[1]).

Table 22.4. Norway: Productivity and environmental indicators

	Norway		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	5.7%	2.4%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	85.0	95.0	32.1	30.0
Phosphorus balance, kg/ha	12.0	11.0	3.4	2.9
Agriculture share of total energy use (%)	1.6	1.5	1.7	2.0
Agriculture share of GHG emissions (%)	8.3	8.8	8.6	9.7
Share of irrigated land in AA (%)	4.2	3.3	-	-
Share of agriculture in water abstractions (%)	32.8	..	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

OECD (2022), *OECD Economic Surveys: Norway 2022*, OECD Publishing, Paris, https://doi.org/10.1787/df7b87ab-en. [2]

OECD (2022), *OECD Environmental Performance Reviews: Norway 2022*, OECD Publishing, Paris, https://doi.org/10.1787/59e71c13-en. [3]

OECD (2021), *Policies for the Future of Farming and Food in Norway*, OECD Agriculture and Food Policy Reviews, OECD Publishing, Paris, https://doi.org/10.1787/20b14991-en. [1]

Notes

[1] https://www.regjeringen.no/no/dokumenter/hurdalsplattformen/id2877252/.

[2] See https://unfccc.int/sites/default/files/resource/LTS1_Norway_Oct2020.pdf for more detail.

[3] The recent OECD Economic Survey of Norway points to housing prices as a significant challenge for Norway. It suggests that "By limiting possibilities for greenfield housing development close to built-up areas, these [agricultural land conversion] restrictions contribute to inflexibility in housing supply. They also likely go beyond what is needed to achieve the aim of safeguarding land for farming, and might therefore be moderated." (OECD, 2022[2]). The recent OECD Environmental Performance Review of Norway observes in its assessment and recommendations that "Managing the interactions between [forestry and agriculture], land use planning and biodiversity objectives requires particular attention" (OECD, 2022[3]).

[4] See www.bondelaget.no/tema/landbruketsklimaplan/landbrukets-klimaplan.

[5] https://www.regjeringen.no/no/dokumenter/hurdalsplattformen/id2877252/.

[6] This TFP calculation includes aquaculture, which represents about 76% of the combined value of the aquaculture and agriculture sectors. Still, the number should be close for agriculture only—TFP calculated for 2011-16 for agriculture alone was estimated to be 2.7% (OECD, 2021[1]).

23 Philippines

Support to agriculture

Support to farmers in the Philippines as a share of gross farm receipts (PSE) averaged 27.1% in 2019-21. This is higher than the OECD average and one of the highest among emerging economies covered in this report.

Market price support (MPS), which reflects existing trade barriers – mainly tariffs and tariff rate quotas (TRQs) – is the dominant form of support to Philippine producers, of which rice producers are the main beneficiaries. High import tariffs also support the prices of sugarcane, maize, pig meat and poultry. As a result, domestic producer prices are 40% higher on average than world market prices. Payments to farmers support variable inputs and investments, mainly for rice producers. MPS and payments for inputs – the most production- and trade-distorting measures – account for almost all support to farmers.

Expenditure on general services (GSSE) more than doubled relative to the agricultural value of production between 2000-02 and 2019-21, largely because of increased investments in irrigation and extension programmes. Expenditures on public stockholding for rice are also an important GSSE expenditure. Despite decreasing from 2.9% in 2000-02, overall support to the Philippine agricultural sector in 2019-21 was 2.7% of GDP, one of the highest among countries reviewed,

Recent policy changes

To stabilise prices and ensure adequate domestic supply, the TRQ for rice was temporarily liberalised in May 2021 for one year and the Most-Favoured Nation (MFN) tariff rate set to 35%, the rate usually reserved for ASEAN member countries. The TRQ for pig meat was provisionally reduced and the volume expanded as the country grappled to contain African Swine Fever.

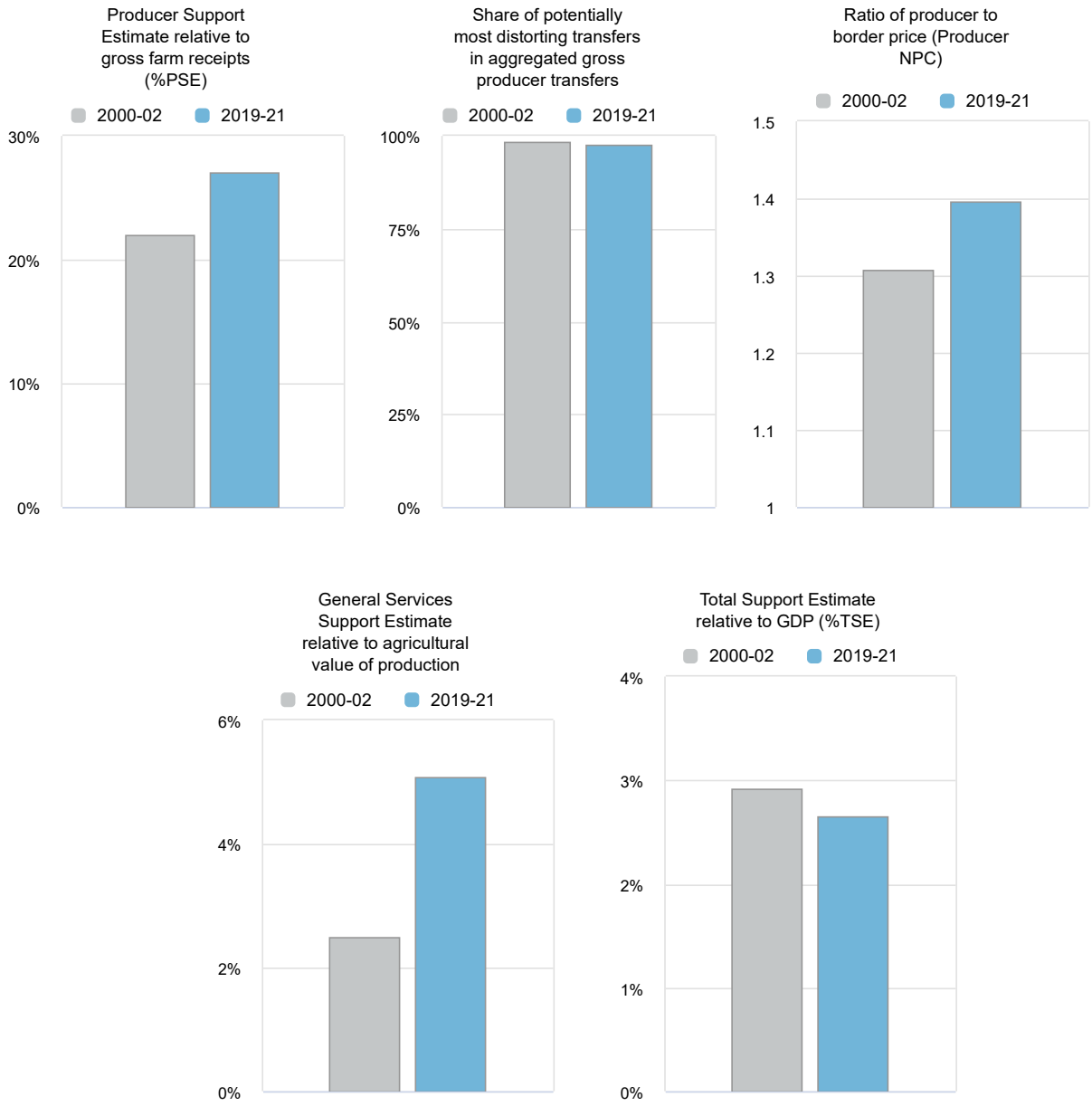
In 2021, the government of the Philippines maintained measures taken in 2020 in response to the COVID-19 pandemic to protect the livelihoods of agricultural producers and the food security of consumers, with a priority on rice. The Rice Resiliency Project – included under the Plant, Plant, Plant Programme designed to enhance food security with support for crops, livestock, poultry and fisheries – received an additional PHP 8.5 billion (USD 173 million) in June 2021 to increase rice self-sufficiency from 87% to 93%.

Funding was extended in 2021 for additional loans and loan guarantees to small farmers under the expanded SURE COVID programme to help recover from the impact of low prices and COVID-19-related impacts on their businesses. Government-imposed retail price controls on basic food items sold in public markets, implemented in 2020 to avoid a sharp rise in retail food prices due to the COVID-19 pandemic, were continued in 2021.

Assessment and recommendations

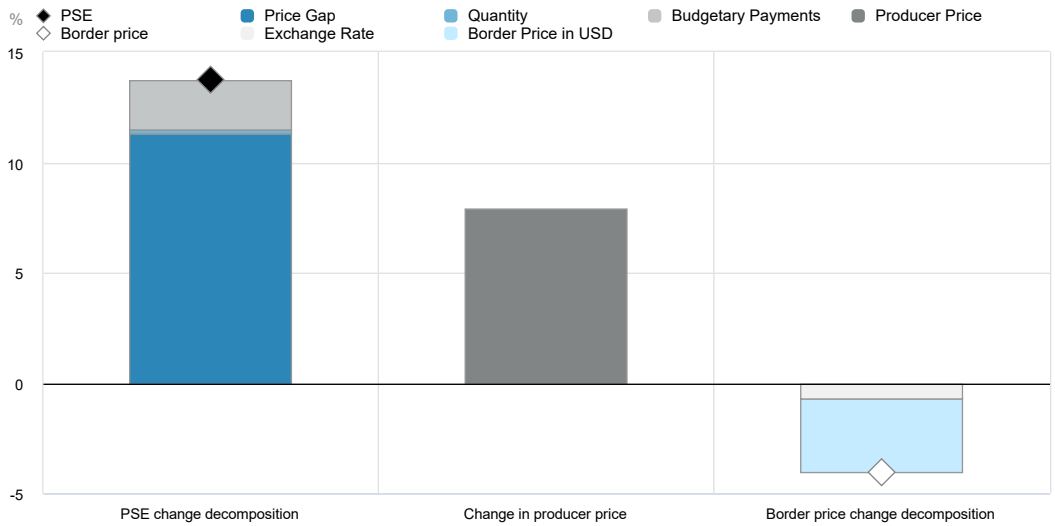
- The Philippines needs to accelerate development and implementation of climate change mitigation policies for agriculture to meet its commitment to reduce emissions by 75% between 2020 and 2030 relative to projected business-as-usual emissions (subject to the provision of climate finance and help with implementation), as outlined in its 2021 Nationally Determined Contribution. Current policy settings focus on adapting to climate change rather than mitigating GHG emissions. Given its ambitious but conditional mitigation commitments, the Philippines will benefit from membership in international mechanisms collaborating on mitigation solutions, such as the Global Research Alliance on Agricultural Greenhouse Gases and the newly launched Global Methane Pledge.
- The Philippines' agricultural policy focuses on food security and poverty alleviation through a guaranteed supply of staple food (rice) at affordable prices. The goal of self-sufficiency in rice drives a range of policies supporting rice producers. Reducing tariff rates for rice (and pig meat) imports during 2021 to ensure food security was a significant, but temporary, policy shift.
- The National Food Authority (NFA) operates emergency buffer rice stocks. However, the NFA uses these to support prices to farmers by buying at administered prices and reducing consumer prices by selling at subsidised prices on retail markets. Hence, these stocks are de facto 'intervention stocks, with significant implications for markets and the government budget. The budget financing these interventions could be more efficiently spent on direct income support, and to finance general services to improve productivity and climate adaptation and resilience in the sector, while bolstering social measures for the most vulnerable consumers.
- Increasing long-term investments in infrastructure and R&D should lift productivity in the agricultural sector. After decades of underinvestment, agricultural total factor productivity (TFP) growth in the Philippines is slower than the global average and most countries in the region.
- In view of the Philippines' susceptibility to typhoons, tropical storms and flooding, which are likely to become more frequent and devastating with climate change, the government should take a holistic approach to risk management that adapts policy objectives across programmes and institutions. The effectiveness of current risk management tools should be assessed – in particular, the extent to which insurance and cash-transfer schemes encourage risk-reducing decision-making on farms. Evaluation should be used to improve policy design and delivery. Support for climate-smart agricultural innovation and advisory services should be prioritised. Lastly, working with regions to make information about local conditions, forecasts and adaptive solutions more available should increase farmers' awareness and capacity to prepare and adjust.
- Improving biosecurity and disease control measures is key for containing outbreaks of African Swine Fever and Highly Pathogenic Avian Influenza and will require coordination among local authorities and extending advisory services.

Figure 23.1. Philippines: Development of support to agriculture



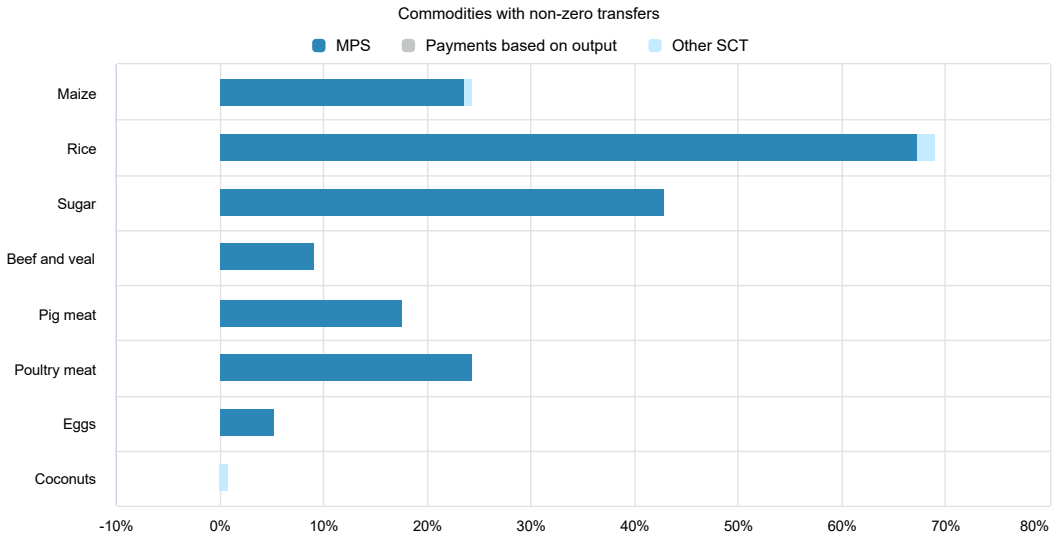
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 23.2. Philippines: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 23.3. Philippines: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 23.1. Philippines: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**9 727**	**30 886**	**29 143**	**30 722**	**32 793**
***of which:** share of MPS commodities (%)*	89.19	93.22	93.12	93.12	93.41
Total value of consumption (at farm gate)	**9 950**	**33 028**	**31 365**	**32 664**	**35 055**
Producer Support Estimate (PSE)	**2 167**	**8 494**	**7 406**	**8 424**	**9 652**
Support based on commodity output	2 094	8 083	7 169	8 022	9 057
Market Price Support[1]	2 094	8 083	7 169	8 022	9 057
Positive Market Price Support	2 134	8 083	7 169	8 022	9 057
Negative Market Price Support	-40	0	0	0	0
Payments based on output	0	0	0	0	0
Payments based on input use	69	396	224	385	579
Based on variable input use	36	209	128	158	339
with input constraints	0	0	0	0	0
Based on fixed capital formation	32	187	95	227	240
with input constraints	0	0	0	0	0
Based on on-farm services	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	0	0	0	0
Based on Receipts / Income	0	0	0	0	0
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	5	15	13	17	15
Percentage PSE (%)	**22.03**	**27.11**	**25.21**	**27.06**	**28.91**
Producer NPC (coeff.)	**1.31**	**1.40**	**1.36**	**1.39**	**1.44**
Producer NAC (coeff.)	**1.28**	**1.37**	**1.34**	**1.37**	**1.41**
General Services Support Estimate (GSSE)	**244**	**1 569**	**1 389**	**1 723**	**1 595**
Agricultural knowledge and innovation system	56	356	258	416	395
Inspection and control	14	79	73	98	67
Development and maintenance of infrastructure	155	920	855	991	913
Marketing and promotion	6	49	45	49	52
Cost of public stockholding	12	139	135	141	142
Miscellaneous	1	26	24	27	26
Percentage GSSE (% of TSE)	**10.11**	**15.60**	**15.79**	**16.98**	**14.18**
Consumer Support Estimate (CSE)	**-2 250**	**-8 667**	**-7 791**	**-8 566**	**-9 643**
Transfers to producers from consumers	-2 299	-8 689	-7 654	-8 551	-9 861
Other transfers from consumers	-152	-597	-570	-584	-635
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	201	618	433	569	853
Percentage CSE (%)	**-22.53**	**-26.22**	**-24.84**	**-26.22**	**-27.51**
Consumer NPC (coeff.)	**1.32**	**1.39**	**1.36**	**1.39**	**1.43**
Consumer NAC (coeff.)	**1.29**	**1.36**	**1.33**	**1.36**	**1.38**
Total Support Estimate (TSE)	**2 411**	**10 063**	**8 795**	**10 146**	**11 247**
Transfers from consumers	2 451	9 285	8 225	9 135	10 496
Transfers from taxpayers	112	1 374	1 141	1 595	1 386
Budget revenues	-152	-597	-570	-584	-635
Percentage TSE (% of GDP)	**2.91**	**2.66**	**2.33**	**2.81**	**2.84**
Total Budgetary Support Estimate (TBSE)	**318**	**1 980**	**1 626**	**2 124**	**2 190**
Percentage TBSE (% of GDP)	**0.38**	**0.52**	**0.43**	**0.59**	**0.55**
GDP deflator (2000-02=100)	**100**	**182**	**181**	**184**	**..**
Exchange rate (national currency per USD)	**48.96**	**50.22**	**51.80**	**49.62**	**49.26**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Philippines are: maize, rice, sugar, beef and veal, pig meat, poultry, eggs, bananas, coconut, mango and pineapple.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Heavy government interventions in agricultural markets within a closed economy characterised the period from 1970 to 1986. The government had monopoly control over trade in rice, sugar and maize, operated by the National Grains Authority (NGA) established in 1972 (later renamed the National Food Authority [NFA]). Sugar trade was nationalised under the National Sugar Trading Corporation. At the same time, high-yield rice varieties were introduced. Input subsidies encouraged farmers to use high-yield varieties of rice, as well as fertilisers and pesticides. Public spending in the sector increased (particularly on irrigation), financed by a mix of taxes on major agricultural exports and foreign loans. Access to credit was facilitated by legally obliging financial institutions to provide 25% of their loans to the agricultural sector. Budgetary expenditures financed extension services to the farming sector (OECD, 2017[1]).

Partial liberalisation of the sector was implemented gradually from 1986 to 2000. Reforms undertaken in the 1990s aimed to improve services provided to agriculture, particularly extension services, and infrastructure. Market interventions were gradually reduced, as were tariffs and non-tariff measures on agro-food imports. The policy of self-sufficiency in rice continued with the provision of input subsidies to farmers, mainly fertilisers and certified seeds, but also credit facilitation and support to public services for agriculture, such as investments in irrigation and farm-to-market roads. At the beginning of the 1990s, the Philippines negotiated a number of trade agreements (for example, it is a founding member of the ASEAN Free Trade Area). Upon joining the WTO in 1995, the country committed to removing quantitative restrictions on imports of sensitive agricultural products (with the exception of rice) and to gradual liberalisation of agro-food trade. Public expenditure on agriculture declined substantially in the late 1990s, due to tight fiscal policies adopted in the aftermath of the Asian Financial Crisis (OECD, 2017[1]).

Furthermore, since 1988, the Philippines has undertaken an ambitious **agrarian reform** to redistribute agricultural land to landless farmers and land workers. The reform covered close to three-quarters of the country's agricultural area. By the end of 2015, the redistribution of land was almost complete, but property rights remain to be settled. Almost half of the reform beneficiaries still have collective ownership certificates instead of individual property rights.

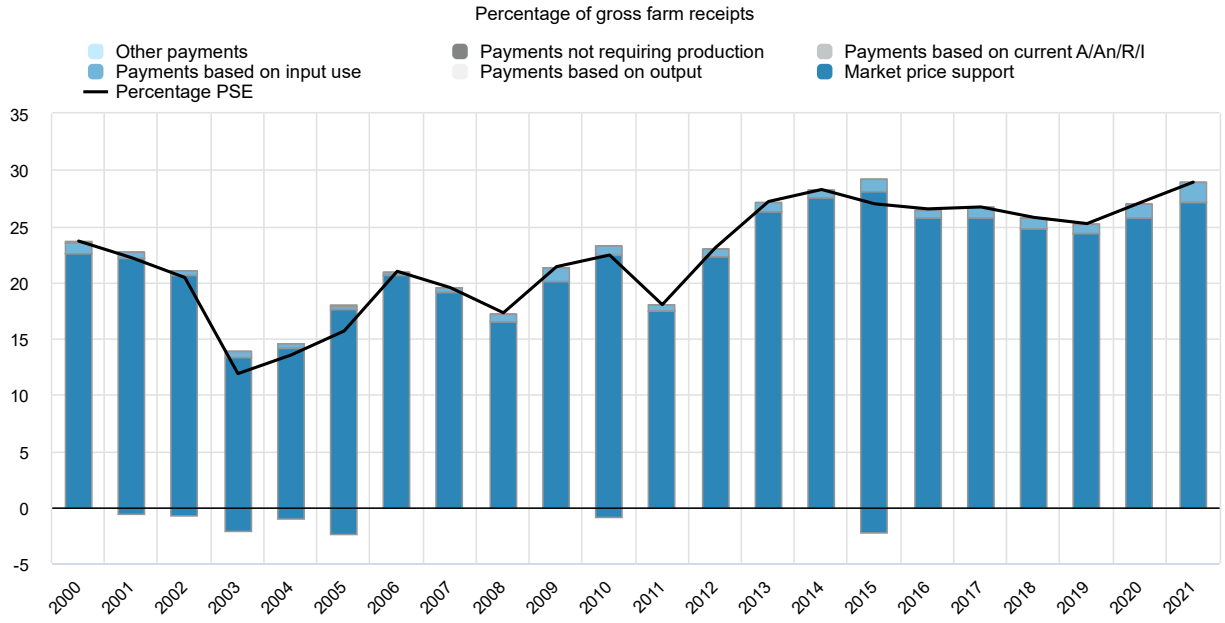
During the 2000s, the government undertook policy measures to further reduce market interventions in agriculture. Subsidised credit programmes were terminated, and private traders allowed to import rice at limited levels. However, the focus on food (rice) self-sufficiency was further reinforced and, after the global food price crisis in 2008, spending on agriculture increased substantially. The government increased public expenditure on irrigation and input subsidies to achieve self-sufficiency. The Food Staples Sufficiency Programme launched in 2011 retained the focus on rice and selected other staples, but shifted emphasis away from input subsidies towards public services to agriculture such as extension and infrastructure (OECD, 2017[1]). Following the Uruguay Round Agreement on Agriculture, the system of quantitative restrictions for rice was abolished in March 2019 and replaced by a tariff rate quota system. To offset the effect of the liberalisation of rice imports on producers' incomes, in 2019 the government established the *Rice Competitiveness Enhancement Fund* (RCEF) with an annual appropriation of PHP 10 billion (USD 203 million) for six years (until 2025).

Support to farmers as a share of gross farm receipts (percentage PSE) tended to slightly increase and then stabilise over the last 20 years. It is above the OECD average and one of the highest among the emerging economies included in this report. Market price support for rice, sugar, maize, beef, poultry, pig meat and eggs constitutes almost all of support to farms (Figure 23.4). Budgetary support to producers is low, and almost exclusively devoted to payments based on input use.

Table 23.2. Philippines: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1986	Closed economy with heavy state interventions in agricultural markets and trade	Agricultural import tariffs; Export taxes on agricultural products State monopoly control over rice and maize trade (NGA, now NFA) Food self-sufficiency (rice and other staples); Increasing support to those commodities Nationalisation of sugar production; Creation of the National Sugar Trading Corporation
1986-2000s	Gradual reforms towards trade liberalization	Continued policy of food self-sufficiency (rice) Land reform started in 1988 (redistribution of land) National Sugar Trading Corporation reduced its functions and changed to the Sugar Regulatory Administration Investments in general services (irrigation, roads) Input subsidies declined due to the Asian financial crisis Removal of quantitative restrictions of all agricultural products except rice FTAs and WTO accession
2000-present	Minor policy change, some forms of state intervention in markets and trade maintained	Food self-sufficiency (rice) continues to be the main objective Quantitative quotas for rice imports High tariffs of some agricultural products, particularly rice and maize Subsidised credit was dismantled Input subsidies for rice Import quantitative restrictions for rice abolished and replaced by import tariffs (2019) Increased budgetary support to rice producers

Figure 23.4. Philippines: Level and PSE composition by support categories, 2000 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Various measures provide price support to Philippine producers. Price support policies mainly focus on rice and sugar with a combination of trade barriers (tariffs and TRQs) and domestic market regulations for rice. The NFA implements rice price support by buying buffer stocks at administered prices from domestic producers and selling these stocks at subsidised prices to consumers. For sugar, production quotas and trade barriers (tariffs and TRQs) provide producer price support and market regulation.

Tariff protection is the Philippines' main trade policy tool. Trade liberalisation primarily occurs within regional trade agreements, particularly the ASEAN Free Trade Area. The simple average applied Most Favoured Nation (MFN) tariff on agricultural products was 9.8% in 2019 (USTA, 2021[2]). Tariff lines applied are ad valorem and range from 0% to 66.9% (USTA, 2021[2]).

Tariff rate quotas are applied to 14 agricultural products, with in-quota tariffs ranging from 30% to 50% and out-of-quota from 35% to 65%. Products covered include live swine, goats and poultry and poultry meat, potatoes, coffee, maize, rice, and sugar. Import licensing is required for all regulated products (including those under TRQs), and is intended to safeguard public health, national security and welfare.

Quantitative restrictions on rice imports were replaced with an **import tariff systems** in March 2019, under the Rice Tariffication and Liberalisation Law (RA 1120) implemented to comply with the Philippines WTO obligations. In place of a quota on imports from ASEAN countries, a single tariff of 35% for rice applies. For rice imports from non-ASEAN countries, a TRQ applies. Applied MFN in-quota and out-of-quota tariffs for rice are set at 40% and 50%, respectively. Additionally, grains, grain products and sugar require export permits. To offset the effects of rice liberalisation and to incentive self-sufficiency the Philippines Department of Agriculture has implemented several support programmes for rice producers.

Budgetary support to agricultural producers, both through payments provided to farmers individually and to the agricultural sector as a whole (general services), is small compared to the level of price support. Budgetary support to producers focuses on subsidising the use of variable inputs, including seed and fertiliser subsidies. General service payments are mainly for infrastructure and agricultural R&D.

Climate change mitigation policies in agriculture

Greenhouse gas emissions (excluding land use) increased 114% during 1990-2017, driven mainly by CO_2 emissions from fuel combustion (Climate Transparency, 2020[3]). The agriculture sector is the third-highest emitter of GHGs in the Philippines, after the energy and transport sectors. In April 2021 the Philippines submitted its National Determined Contribution (UNFCCC, 2021[4]) which increased its commitment to reduce GHG emissions between 2020 and 2030 by 75% relative to projected business-as-usual cumulative emissions, of which 2.7% is unconditional[1] and 72.3% is conditional.[2] For 2021-30, the conditional target GHG emission reduction for agriculture is 29.4% below the business-as-usual scenario of 539.09 MtCO2eq (cumulative emissions) (DA, 2022[5]). At COP26 in November 2021, the Philippines joined the Global Methane Pledge to reduce global methane emissions by at least 30% from 2020 levels by 2030, with focus on high-emission sources (EC, 2021[6]). The Philippines is also a member of the Global Research Alliance on Agricultural Greenhouse Gases.

Mitigation efforts focus on the major sources of agricultural GHG emissions accounting for the following proportions of agricultural emissions: paddy rice cultivation (52%), livestock enteric fermentation (20%), soil cultivation (16%), and livestock manure management (10%). For paddy rice cultivation, the Philippines aims for all its 3.21 million hectares of irrigated rice area to adopt technologies and practices including the Alternate Wetting and Drying technology, cropland management (nature-based solutions like microbial inoculants), and renewable energy for water management. To reduce emissions from livestock by 50%, the Philippines aims to use nature-based solutions, e.g. seaweed from Australia, microbial inoculants, diet modification, zeolite, enzymes and breeding interventions. To achieve a 25% reduction in the total N_2O emissions for soil cultivation, cropland management techniques such as supplements like biochar and

organic fertiliser to increase soil friability are being promoted along with precision agriculture and biotech crops.

Within the Department of Agriculture (DA), the Climate Resilient Agriculture Office oversees programmes focused on climate change adaption and mitigation in agriculture through climate-smart agriculture regulations, investments in infrastructure and extension services, information systems and risk management (DA, 2021[7]). The Climate Resilient Agriculture Office also provides climate and weather-informed advisory services, leads the completion of climate-risk and vulnerability assessments, and disaster-risk reduction financing and risk transfer.

Domestic policy developments in 2021-22

In 2021 the NFA intervened on the domestic market by buying rice for buffer stocks at a price set at PHP 19 (USD 0.38) per kg of rice, and also by selling domestic rice from its buffers at an administered price (generally below the market price) in order to lower consumer prices. Overall, these stocks play more a role of an "intervention stock" rather than an "emergency buffer stock". In 2021 the DA allocated a total of PHP 41 billion (USD 832 million) to the rice buffer stocking programme for procuring and then distributing palay rice.

Support to rice farmers under the *Rice Competitiveness Enhancement Fund* (RCEF) was allocated across the following categories in 2021: PHP 4.5 billion (USD 91 million) for rice farm machinery and equipment; PHP 2.5 billion (USD 51 million) for rice seed development, propagation and promotion; PHP 1 billion (USD 20 million) for credit to farmers; and PHP 1 billion (USD 20 million) for extension services. This fund, initiated in 2019 and available for six years until 2025, has an annual budget of PHP 10 billion (USD 203 million) (financed from the receipts from rice import tariffs).

In 2021, one and a half million small rice farmers (with landholding of 2 hectares or less) benefited from cash transfers of PHP 5 000 (USD 101) per farm. Funding for this cash assistance came from the excess rice tariff collection (above the PHP 10 billion used for financing the RCEF) in 2019 and 2020, which amounted to PHP 7.6 billion (USD 154 million). From 2020 until the end of June 2021, small producers of corn, coconut and sugar cane received a similar support from the budget in the form of cash and food assistance[3] worth PHP 5 000 per farm.

Since 2019, when the Philippines reported its first outbreak of African Swine Fever, the country has been struggling to contain the virus which has resulted in a loss of over 3 million pigs. Small scale pig raisers in ASF-infected areas have received a payment of PHP 5 000 for every culled pig from the DA since the outbreak began. In May 2021, the President declared a year-long state of calamity due to ASF. National zoning measures are in place and the DA is providing financial and technical support to ASF-affected producers under its Integrated National Swine Production Initiative for Recovery and Expansion programme and the public and private Bantay ASF sa Barangay (BaBay ASF) initiative launched in February 2021. This latter initiative targets improvements in biosecurity and disease control measures through co-operation between local authorities, specialist biosecurity officers and farmers.

In 2021, there were 130 Adaptation and Mitigation Initiative in Agriculture (AMIA) villages established to showcase the integration of climate resilient agriculture practices in their farm operations. As part of the DA's climate resilient agriculture policy, the Climate Resilient Agriculture Office partnered with national and local government units to expand the regional coverage of climate risk and vulnerability assessments to develop an understanding of the current and future climate risks facing the region and the delivery of farm and fishery advisory services based on climate and weather forecasts. To inform and encourage adoption by food chain stakeholders the Climate Resilient Agriculture Office used social media to increase public outreach about its climate change adaptation and mitigation activities.

As part of its commitments at the UN Food Systems Summit, in September 2021 the Philippines submitted plans to develop a National Food Systems Transformation Pathway (The Philippines Government, 2021[8])

which will include prioritised actions to implement strategic food systems objectives, new governance mechanisms to ensure food systems policy coherence across government agencies and at the federal and local levels, as well as new data collecting and monitoring and evaluation mechanisms to ensure the effectiveness of food systems policy actions.

The Philippines ranked 9th in the world amongst countries most affected by extreme weather events in the 2021 World Risk Index (IFHV, 2021[9]). In mid-December 2021, the category 5 typhoon Rai struck late in the typhoon season which usually runs from July to October. Damage to homes, infrastructure and farmland are estimated to cost USD 410 million. In response to typhoon Rai DA imposed further price freezes for farm products in the affected provinces.

Domestic policy responses to the COVID-19 pandemic

In June 2021, the Rice Resiliency Project received an additional PHP 8.5 billion (USD 173 million) of funding for its implementation. With its goal to increase the country's rice self-sufficiency level from 87% to 93%, the "Rice Resiliency Project" is part of the broader *Plant, Plant, Plant Programme* introduced by the DA in 2020 to enhance food security in response to concerns amidst the COVID-19 pandemic.

Funding continued to be provided by the Agricultural Credit and Policy Council to the expanded Survival and Recovery Assistance Programme for Rice Farmers (SURE Aid) and Recovery Project (SURE COVID-19) for small farmers and fishermen (SFF) and agriculture and fishery micro and small enterprises (MSE) whose livelihoods, agribusiness operations, and incomes were affected by the COVID-19 pandemic. Total funding of these loan programmes in 2021 represented PHP 1.2 billion (USD 24 million) with loans to crop production comprising 76% of the total loans and loans to fisherfolk and livestock producers for 10% each. Under this project, additional loans and loan guarantees were extended to SFF and MSEs amounting PHP 808 million (USD 16 million) in 2021.

During 2021 the DA continued to implement major interventions to ensure adequate, accessible, and affordable food to Filipino households, particularly in Metro Manila and other major centres, during the COVID-19 pandemic. To ensure a stable supply of affordable basic food commodities for Metro Manila, the DA implemented a *Food Resiliency Action Plan* whereby demand and supply (including the source of supply) for basic food commodities are monitored weekly. A network of government stores ("KADIWA ni A ni at Kita") sells basic food items supplied by small farmers and fisherfolk to Metro Manila residents at regulated prices. At the end of 2021 there were 187 KADIWA stores nationwide, with 28 of these located in Manila.

In order to avoid a sharp rise in retail food prices due to the COVID-19 pandemic, during 2020 and 2021 the government imposed suggested retail prices (SRPs) on basic food items including pork, poultry, fish, sugar, onion, garlic, beef and selected vegetables.

Trade policy developments in 2021-22

In May 2021, the MFN tariff rate for rice was reduced for one year to 35%, the same rate as rice from ASEAN member countries compared to the usual in-quota tariff rate of 40% and an out-of-quota rate of 50%. The temporary liberalisation of the rice market is to boost supply and the diversity of rice suppliers during the pandemic and reduce the impact climate change on food security (USDA, 2021[10]). At the same time the Minimum Access Volume (the TRQ) for pig meat was increased temporarily from 54 210 metric tonnes to 254 210 metric tonnes and the in-quota and out-of-quota rates were reduced to address rising pork prices resulting from constrained domestic production as the Philippines culls stock to control outbreaks of African Swine Fever (USDA, 2021[11]).

Reduced tariff rates for mechanically deboned or mechanically separated poultry (from 40% to 5%) and frozen whole turkey (from 40% to 20%) implemented in June 2019, remain in place until 31 December 2022.

In January 2021, the DA issued a temporary ban on the importation of domestic and wild birds and poultry products from France, Korea and the Netherlands. The ban was imposed in response to outbreaks of highly pathogenic avian influenza (HPAI). In the case of the Netherlands the ban remained in place until August 2021 and was reinstated in November 2021. The Netherlands usually accounts for 20% of the Philippines' annual poultry imports and is a major supplier of mechanically deboned chicken meat, a key raw product for meat processors.

In 2021, Philippines renewed efforts to complete its ratification process of the Regional Comprehensive Economic Partnership (RCEP). In September 2021, the President ratified the RCEP and following ratification by the Senate it is expected to enter into force in the Philippines in the first half of 2022. Once the Philippines formally ratifies the RCEP, 75% of the country's 1 718 agricultural tariffs will be set to zero and 15% of its agricultural tariffs will be reduced with only 9% will remain unchanged. Sensitive agricultural products including rice, maize and sugar will remain excluded from tariff reductions under the RCEP.

Trade policy responses to the COVID-19 pandemic

One of the goals of temporarily liberalising the rice market in 2021 for one year is to boost and diversify rice supply during the pandemic and stabilise prices for the Philippines, the world's third largest rice importer after the People's Republic of China and Bangladesh. From May 2021 the MFN tariff rates for rice were reduced to 35% (the rate usually reserved for ASEAN member countries) compared to the usual in-quota tariff rate of 40% and an out-of-quota rate of 50% with a TQR volume of 350 000 metric tonnes.

Contextual information

The Philippines is a mid-size country in terms of land area, but its population of 110 million makes it the world's 13th most populous country. With a median age of 24 years, the Philippines has a comparatively young population and 48% of Filipinos live in urban areas. At USD 8 390 in purchasing power parity (PPP), GDP per capita is less than half the average GDP per capita of all countries analysed in this report (Table 23.3). Agriculture is an important sector for the Philippines, accounting for a quarter of total employment and 10% of GDP (Table 23.3). Farms tend to be small-sized with the average landholding at just 1.3 hectares.

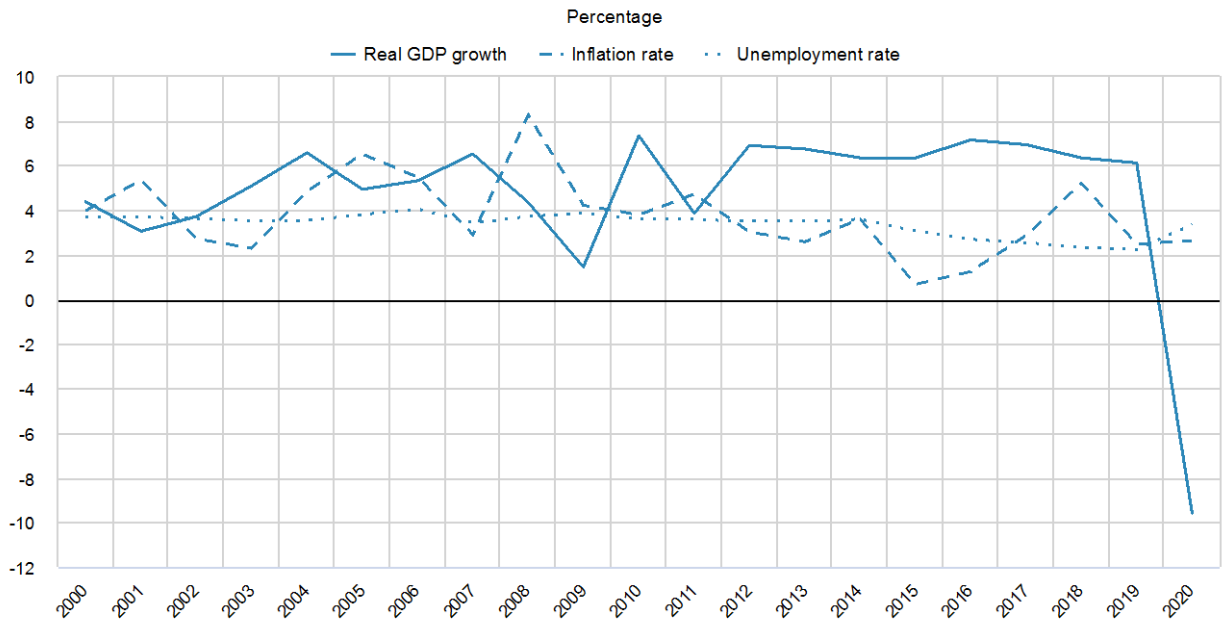
Since 2012, the Philippines has achieved relatively stable growth of around 6% annually, and enjoys comparatively low levels of unemployment that had been falling since 2015 to approach 2% in 2019 (Figure 23.5). However, due to the COVID-19 pandemic, GDP fell by around 10% in 2020 and unemployment levels increased. Inflation has been fluctuating and was above 4% in 2018 but declined to just over 2% in 2019 and 2020 (Figure 23.5). Overall, the Philippines economy, including its agro-food sector, is well integrated into international markets as measured by the ratio of trade to GDP at 21% in 2020.

Table 23.3. Philippines: Contextual indicators

	Philippines		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	268	919	0.7%	0.8%
Population (million)	78	110	1.8%	2.1%
Land area (thousand km²)	298	298	0.4%	0.4%
Agricultural area (AA) (thousand ha)	11 234	12 440	0.4%	0.4%
			All countries[1]	
Population density (inhabitants/km²)	262	368	53	63
GDP per capita (USD in PPPs)	3 440	8 390	9 281	20 929
Trade as % of GDP	45	21	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	13.9	10.2	2.9	4.9
Agriculture share in employment (%)	37.1	22.5	-	-
Agro-food exports (% of total exports)	4.0	8.4	6.2	8.5
Agro-food imports (% of total imports)	7.3	14.0	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	63	58	-	-
Livestock in total agricultural production (%)	37	42	-	-
Share of arable land in AA (%)	45	45	32	34

Notes: *or closest available year. 1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 23.5. Philippines: Main economic indicators, 2000 to 2020

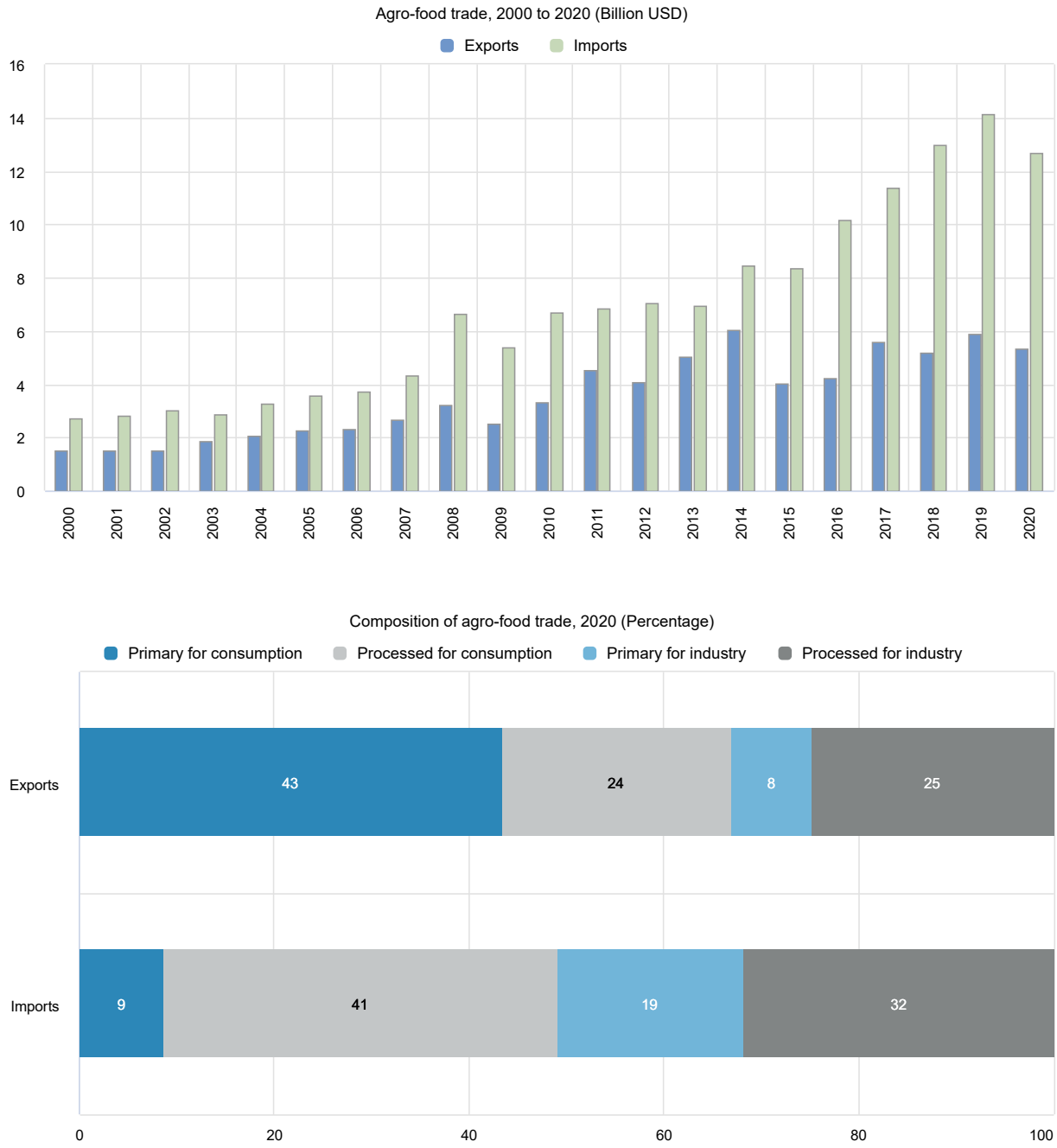


Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

With limited land and a large population, the Philippines is a growing net importer of agro-food products. Of these imports, close to three-quarters are processed goods that are used for (final) consumption or as

intermediate inputs by the processing industry. On the export side, 43% are exports of primary goods for consumption. Overall, two-thirds of all agro-food exports are going to final consumers.

Figure 23.6. Philippines: Agro-food trade

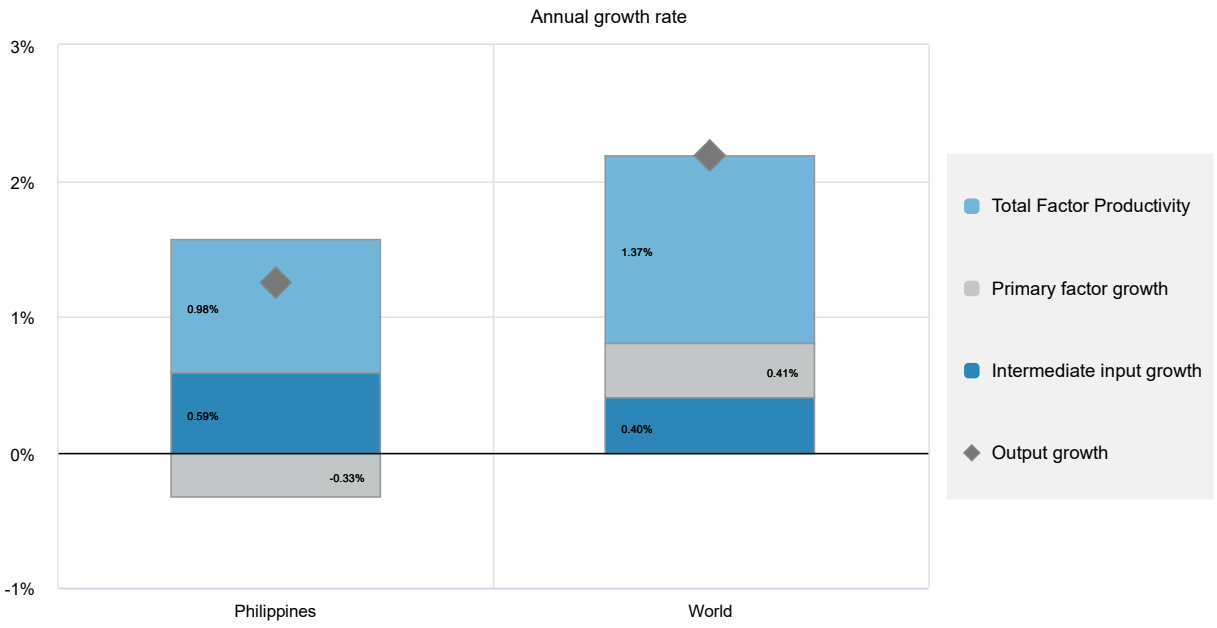


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Total Factor Productivity (TFP) for agriculture in the Philippines is comparatively low, resulting in agricultural output growth averaging just over 1.25% per year, well below the world average (Figure 23.7). Increased use of intermediate inputs is largely offset by declining deployment of primary factors.

Agricultural land resources are under strain from frequent natural disasters, population growth and urbanisation. Water resources in the Philippines are abundant and the agricultural sector is the main water user - accounting for over 70% of total freshwater withdrawals (Table 23.4). Nonetheless, shortages can occur during the dry season in some regions. Energy use by the sector has increased but remains well below the OECD average. The nitrogen balance has slightly decreased, while that of phosphorus has increased, but both remain above the OECD average with phosphorus more than double this figure.

Figure 23.7. Philippines: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 23.4. Philippines: Productivity and environmental indicators

	Philippines		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.4%	1.0%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	50.8	48.1	32.1	30.0
Phosphorus balance, kg/ha	7.7	7.9	3.4	2.9
Agriculture share of total energy use (%)	0.2	0.7	1.7	2.0
Agriculture share of GHG emissions (%)	29.2	..	8.6	9.7
Share of irrigated land in AA (%)	..	15.2	-	-
Share of agriculture in water abstractions (%)	82.4	72.3	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Notes: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Unconditional refers to policies and measures which can be undertaken using nationally mobilised resources.

[2] Conditional refers to policies and measures which require support or the means of implementation under the Paris Agreement.

[3] PHP 3 000 in cash and PHP 2 000 in kind (PHP 1 000 for rice and PHP 1 000 for chicken and eggs). Beneficiaries can obtain rice, chicken, and eggs using an e-voucher system.

24 South Africa

Support to agriculture

South Africa reduced support to agriculture during the reforms of the mid-1990s and support to farms has remained below 5% of gross farm receipts since 2010. In 2019-21, support to agriculture was 2.6% of gross farm receipts.

Market price support (MPS) and payments based on input use are the largest components of support to farmers. The level of price distortions is low and domestic prices for most commodities align with world prices – except for sugar and, to a lesser extent, wheat, mainly due to import tariffs. Consequently, only those two commodities receive single-commodity support, worth 30% and 5% of their respective gross receipts. Most direct payments are provided as an input subsidy (fuel tax refund) and investment subsidies to support smallholder farmers.

Support for general services to the sector (GSSE) declined relative to the size of the sector. Its level is below the average of other countries in this report, and below the OECD average. The GSSE averaged 1.4% of the value of agricultural production during 2019-21, below the 3.8% observed in the early 2000s. Most payments to general services go to the agricultural knowledge and innovation system, and expenditure on infrastructure. Support in these categories targets an enabling environment for small-scale farming, which emerged following the ongoing land reform process that began in the mid-1990s. Expenditures for inspection and control are also an important and growing element of services. Overall, support fell in relative terms from an average of 0.6% of GDP in 2000-02 to 0.3% in 2019-21.

Recent policy changes

In recent years, policy changes sought to enhance land reforms, including the redistribution of commercial farmland to Black producers to redress the outcomes of past discriminatory laws that limited Black people from occupying and buying land. Significantly, a bill amending the Constitution to provide for the expropriation of land without compensation was rejected by the National Assembly in December 2021.

The national budget item on Agriculture, Land Reform and Rural Development (Vote 29), passed into law by the National Assembly in 2021, provides the Department of Agriculture, Land Reform and Rural Development (DALRRD) with resources and a mandate to develop agricultural value chains, provide agricultural inputs, increase equitable access to land, and facilitate rural development.

On 18 March 2021, the ZAR 1 billion (USD 67.6 million) Agri-Industrial Fund launched to support the development and expansion of the agricultural sector by assisting Black producers and entrepreneurs in developing, expanding, acquiring and integrating operations in prioritised value chains. It also aims to accelerate land redistribution and increase exports.

During the 2020-21 period, the wheat and sugar import tariffs were adjusted four and two times respectively, ending 55% lower compared to 2019-20 for wheat and 17.5% lower for sugar.

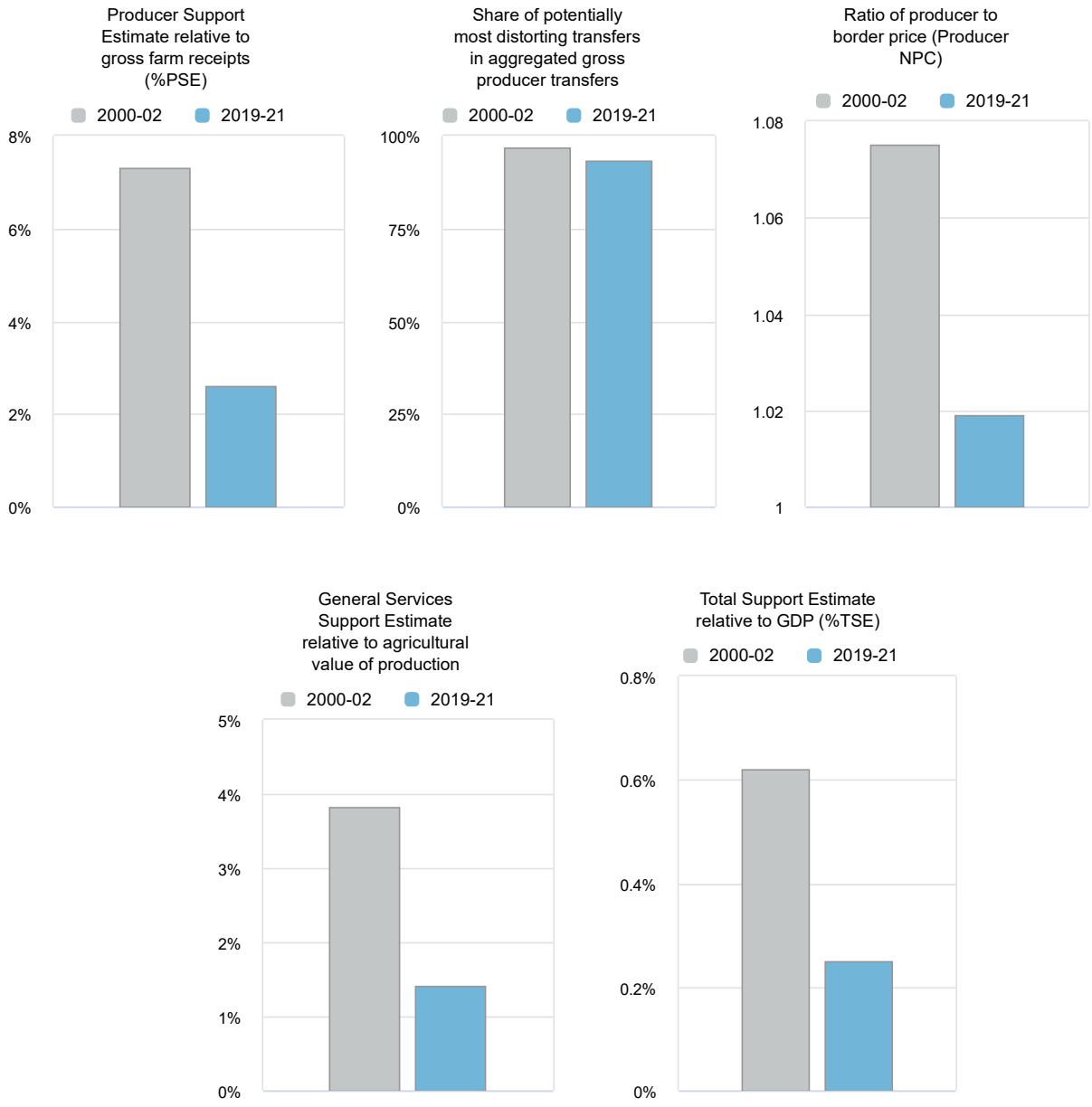
South Africa committed to lowering its economy-wide greenhouse gas (GHG) emissions 12-32% by 2030, as outlined in its Nationally Determined Contribution (NDC), updated in September 2021. The NDC does not set sector-specific targets, nor does it commit to a carbon neutrality goal. If it is passed into law, the Climate Change Bill approved by Cabinet in September 2021 will serve as the legal framework for action on climate change to move to a net-zero emissions economy by 2050. It will establish sectoral emission targets, including for agriculture.

Assessment and recommendations

- The Carbon Tax Bill is an integral part of government policy on climate change, but it does not apply to agricultural emissions in Phase 1 (2019-22). Agriculture is only indirectly affected in this phase, through increased input costs for fuel and energy, and energy-intensive inputs such as fertiliser, although the fuel tax rebate dilutes incentives to lower fossil fuel energy use. Expanding the scope of the carbon tax in its next phase after 2022 to include agricultural emissions, along with social safety net policies to offset potential food price increases and income losses for poor households and producers caused by this change, would incentivise agricultural emission reductions. Alternatively, the creation of an offset mechanism that enables the agricultural sector to sell emission reduction credits to taxed sectors would avoid additional costs for farmers and food consumers. Furthermore, a sectoral emissions target for agriculture should be established under the Climate Change Bill once it becomes law.
- With significant policy reforms in the mid-1990s, South Africa successfully opened its markets for the agricultural sector by eliminating MPS for most products. MPS for sugar remains high, and the government should consider reducing import tariffs as progress is made implementing the 2020 Sugarcane Value Chain Master Plan, which aims to stabilise and restructure the sector to make it more resilient and inclusive.
- Since the 1990s reforms, increases in budgetary spending have financed the land reform process and supported its beneficiaries (mainly smallholders and emerging commercial farmers). This mostly finances general services to the sector through R&D, knowledge transfer and infrastructure. The challenge continues to be the timely funding of economically viable projects and the coordination and targeting of support programmes tailored to the needs of emerging farmers.
- Increasing the involvement of experienced and willing commercial farmers in developing support programmes is key to building the capacity of emerging entrepreneurs who seek to become commercial producers. Public-private partnerships and industry associations can facilitate this. This approach could address weaknesses in programmes and services by public authorities. Expropriation of property without compensation remains a concern. Despite the failed attempt to amend the constitution for this purpose, uncertainty about property rights remains and could undermine investor confidence in the sector.
- The pace of land reform should be linked to developing an enabling environment for its beneficiaries, including education, training, infrastructure, and access to modern farming equipment, finance and markets. Particularly important is upskilling public extension officers and providing them with resources to service rural communities and emerging commercial producers. Capacity in the private sector and learning and training institutions can be leveraged to accelerate revitalising public extension services. Without these developments, land redistribution cannot deliver the expected outcomes, such as improving the welfare of rural Black populations, increasing food security in rural areas and developing a viable commercial sector.

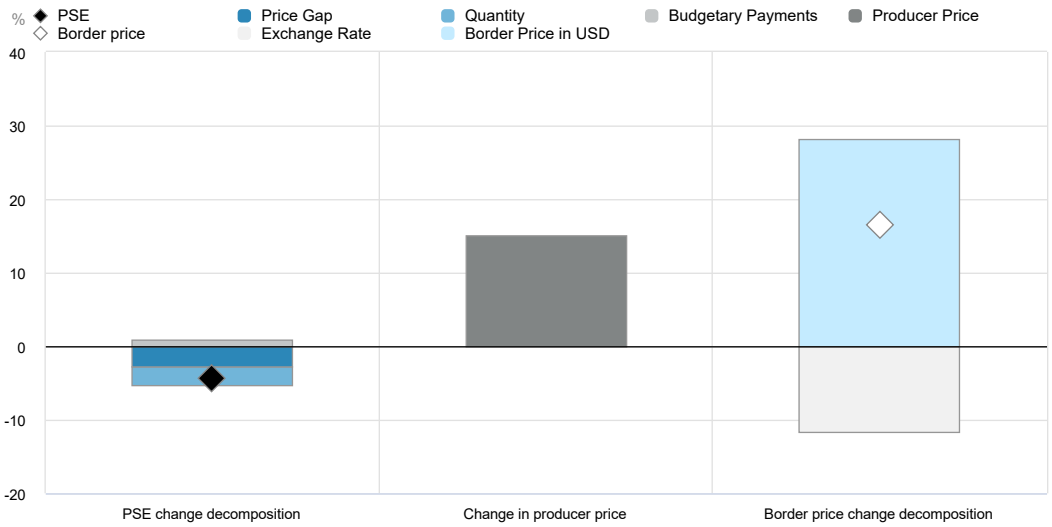
  Very low nutrient balances (negative in the case of nitrogen) across South Africa raise questions about soil fertility in parts of the country. The government should focus on improving soil fertility through conservation agriculture practices and improving market access to fertilisers where appropriate.

Figure 24.1. South Africa: Development of support to agriculture



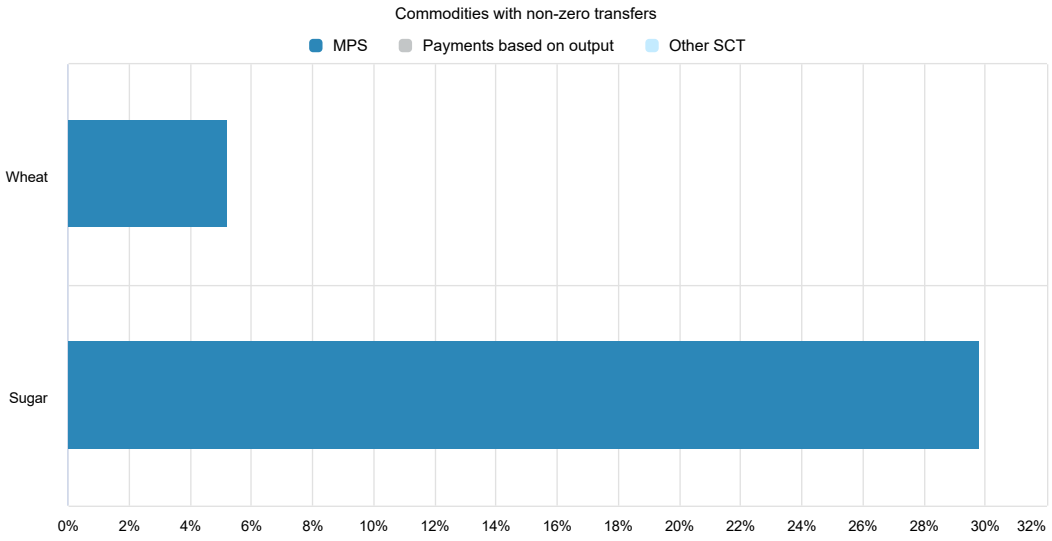
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 24.2. South Africa: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 24.3. South Africa: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 24.1. South Africa: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**6 824**	**21 947**	**20 264**	**20 318**	**25 259**
***of which:** share of MPS commodities (%)*	74.75	72.52	72.67	71.85	73.03
Total value of consumption (at farm gate)	**6 000**	**19 189**	**18 788**	**17 767**	**21 012**
Producer Support Estimate (PSE)	**477**	**579**	**594**	**553**	**589**
Support based on commodity output	438	409	416	400	412
Market Price Support[1]	438	409	416	400	412
Positive Market Price Support	451	409	416	400	412
Negative Market Price Support	-13	0	0	0	0
Payments based on output	0	0	0	0	0
Payments based on input use	36	168	173	154	177
Based on variable input use	25	131	134	121	139
with input constraints	0	0	0	0	0
Based on fixed capital formation	11	36	38	32	38
with input constraints	0	0	0	0	0
Based on on-farm services	1	1	1	1	1
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	3	1	4	0	0
Based on Receipts / Income	3	1	4	0	0
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**7.32**	**2.62**	**2.90**	**2.70**	**2.32**
Producer NPC (coeff.)	**1.08**	**1.02**	**1.02**	**1.02**	**1.02**
Producer NAC (coeff.)	**1.08**	**1.03**	**1.03**	**1.03**	**1.02**
General Services Support Estimate (GSSE)	**264**	**310**	**306**	**301**	**323**
Agricultural knowledge and innovation system	146	126	126	124	129
Inspection and control	39	67	62	68	70
Development and maintenance of infrastructure	78	96	95	89	103
Marketing and promotion	0	21	23	20	21
Cost of public stockholding	0	0	0	0	0
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**34.18**	**34.89**	**34.05**	**35.20**	**35.37**
Consumer Support Estimate (CSE)	**-350**	**-372**	**-465**	**-325**	**-325**
Transfers to producers from consumers	-347	-324	-399	-264	-309
Other transfers from consumers	-17	-48	-66	-61	-17
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	14	0	0	0	0
Percentage CSE (%)	**-6.03**	**-1.93**	**-2.48**	**-1.83**	**-1.55**
Consumer NPC (coeff.)	**1.07**	**1.02**	**1.03**	**1.02**	**1.02**
Consumer NAC (coeff.)	**1.06**	**1.02**	**1.03**	**1.02**	**1.02**
Total Support Estimate (TSE)	**741**	**889**	**900**	**854**	**912**
Transfers from consumers	364	372	465	325	325
Transfers from taxpayers	394	565	501	590	603
Budget revenues	-17	-48	-66	-61	-17
Percentage TSE (% of GDP)	**0.62**	**0.25**	**0.26**	**0.28**	**0.22**
Total Budgetary Support Estimate (TBSE)	**304**	**479**	**484**	**454**	**500**
Percentage TBSE (% of GDP)	**0.25**	**0.14**	**0.14**	**0.15**	**0.12**
GDP deflator (2000-02=100)	**100**	**316**	**300**	**316**	**332**
Exchange rate (national currency per USD)	**8.69**	**15.23**	**14.45**	**16.46**	**14.78**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for South Africa are: wheat, maize, sunflower, sugar, milk, beef and veal, pig meat, sheep meat, poultry, eggs, groundnuts, grapes, oranges and apples.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Widespread support, regulation, and price and production control within a closed economy characterised agricultural policy in South Africa under the apartheid regime between 1955 and 1990.

Post-apartheid, quick and substantial reforms in the mid-1990s reduced state intervention in agricultural markets, and led to more market-oriented commercial farming. Domestic marketing of agricultural products was deregulated, and barriers to agricultural trade were reduced by replacing direct import controls with tariffs, removing state controls over exports, and eliminating export subsidies. These reforms reduced market price support and budgetary support to commercial farming.

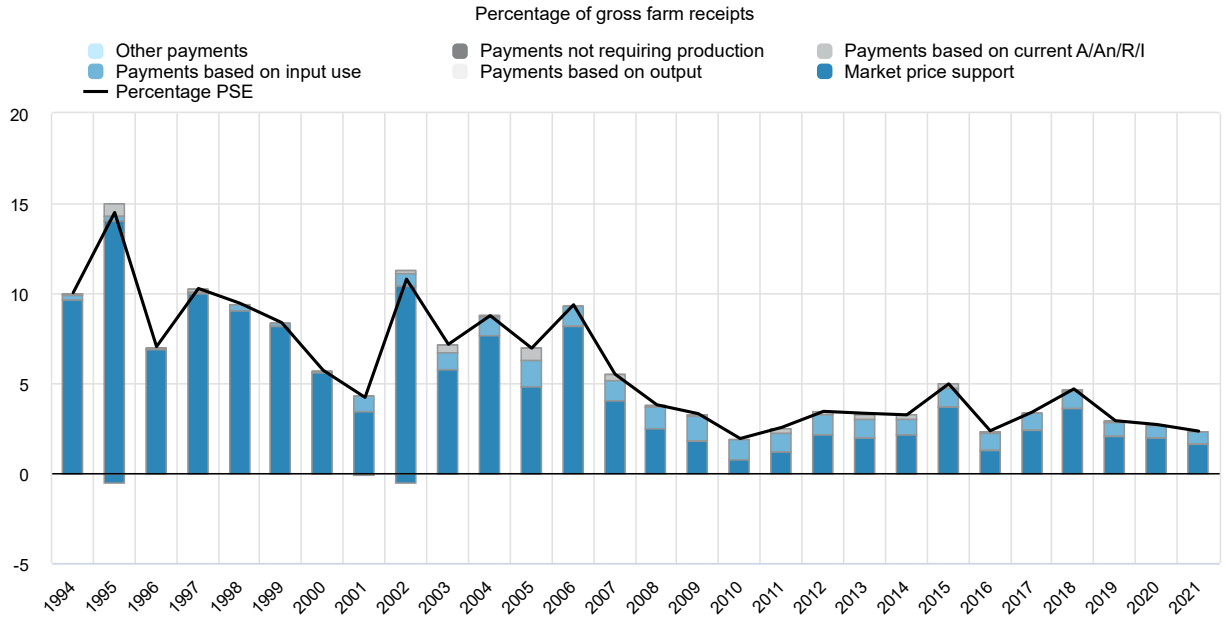
As stated in the White Paper on Land Policy of 1997, land reform aimed to redress past injustices, foster reconciliation and stability, support economic growth, improve household welfare, and alleviate poverty. Key elements of the land reform included land restitution, land redistribution and land-tenure reform. The land reform process is on-going and further legislative regulations have been submitted to facilitate the acceleration of the land reform process. 13.22 million hectares (or 17% of land used for agriculture) has been transferred away from white landowners (this includes restitution, redistribution, private transactions, and State procurement) by 2020 (Sihlobo and Kirsten, 2021[1]). Of this, 3.08 million hectares have been transferred to the state and 10.14 million hectares have been transferred to black owners. In several instances, communities elected to receive financial compensation where land was successfully identified for restitution (2.34 million hectares). Sihlobo and Kirsten (2021[1]) therefore argue that 15.56 million hectares (20%) of total area of agricultural land rights have been restored since 1994. Since it started, the land reform has been accompanied by agriculture support exclusively targeting black smallholders and emerging producers (mainly provided within the Comprehensive Agricultural Support Programme [CASP]). These include subsidies for variable and fixed input credit and financial support, extension, marketing, and training services (Table 24.2).

Table 24.2. South Africa: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to mid-1990s	Closed economy under the apartheid regime	Large subsidies for commercial agricultural producers Import controls; export subsidies for agricultural products Price and production controls under the Agricultural Marketing Act of 1937
Mid-1990s-present	Post-apartheid period; democratic government; market deregulation and trade liberalisation Land redistribution; emphasis on black small-scale producers' development	Marketing of Agricultural Products Act (1996) brings market deregulation and trade liberalisation WTO accession Agricultural tariffs replace import controls Import tariffs applied to sugar, wheat and maize (0 tariffs for maize from 2007) and livestock products (except eggs) Land restitution and redistribution Land reform-related programmes supporting black smallholder farmers: - Increased spending to finance the land reform process - Direct support targeting black smallholders

Support to farmers has been decreasing as a share of gross farm receipts (with some year-to-year variation) during 1995–2007 because of policy reforms and deregulation of the market. Since then, support has tended to stabilise at a relatively low level, around 4% of gross farm receipts. Market price support is the main component of support, provided mainly to sugar (Figure 24.4). Budgetary support to producers, mostly input subsidies, is targeted to black smallholders. Budgetary expenditures on general services to the sector are increasing and spent mainly on knowledge transfer and infrastructure.

Figure 24.4. South Africa: Level and PSE composition by support categories, 1994 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The current system has no domestic market support interventions or export subsidies. Border measures, applied on Southern African Customs Union (SACU[1]) common borders, are the only price support policy for all commodities except sugar (see Sugar Agreement below).

Import protection for agricultural and food products is based on specific and ad valorem tariffs. The average applied Most Favoured Nation (MFN) tariff for agricultural products is 8.7%, well below the average bound tariff on agricultural products of 39% (WTO, 2022[2]). Tariff rate quotas (TRQs) exist for a range of agricultural products under the WTO minimum market access commitments. The zero import-tariff for maize applies since 2007. There is also a variable tariff formula in place for maize and wheat.

The Sugar Agreement of 2000 (between agents in the sugar production chain) permits exports of raw sugar only through a single-channel industry arrangement and allocates quotas to individual sugar mills for sugar sold on the domestic and export market.

The Sugarcane Value Chain Master Plan, signed off in 2020, has various strategies to make sugar production profitable, including investment in value addition and crop diversification strategies. The Master Plan aims to stabilise and reverse a steep decline in the performance of the sector, which has experienced 25% decline in output 60% of sugar farmers over the past two decades. The Master Plan has a phased approach, with an initial phase focusing on immediate actions to stabilise and prevent a collapse of the sugar industry, with the objective of creating a window of 2-3 years during which a programme of restructuring is planned to improve the foundations of the industry for the future. Actions in the first phase include: retail, wholesale and industrial stakeholder commitments for the procurement of local sugar; the

labelling and promotion of local sugar; commitments by the sugar industry prevent the price of sugar from exceeding the annual average consumer price index; the provision of protection by government from deep-sea imports; and provide tariff rate flexibility and rebates where the local sugar industry is unable to meet demand by retail, wholesale and industrial users; provide support in the form of preferential cane pricing and interventions to improve value-chains and yields. Stakeholder commitments for restructuring include: skills development and actions to increase ownership and participation by small-scale growers and workers through the value-chain; and actions to re-balance growing, milling and refining capacity in line with market requirements (Sugar Master Plan 2020).

Other policy instruments include input subsidies, mainly in the form of a diesel tax rebate for farmers; programmes supporting new farmers benefiting from land reforms; and general services provided to the sector, mainly research, extension and inspection services. The National Land Care Programme (NLP) is a community-based and government-supported approach promoting sustainable management and use of natural agricultural resources.

During the reforms concerning land restitution and land redistribution launched in 1994, a range of programmes (e.g. the Comprehensive Agricultural Support Programme, Illima/Letsema projects and Micro-agricultural Financial Institutions of South Africa [MAFISA]) were implemented to create an enabling environment for previously disadvantaged farmers (subsistence, smallholders and commercial). Support measures included input subsidies, capacity building, provision of information services and infrastructure development.

The Department of Rural Development and Land Reform (DRDLR) has an ongoing commitment to build sustainable rural livelihoods. As part of this commitment the Agricultural Land Holding Account (ALHA) was established. The ALHA was established in terms of the Provision of Land and Assistance Act, 1993 (Act No. 126 of 1993). Through the ALHA the state can proactively and legally target and acquire land from funds appropriated by parliament and merge this with the demand or need for land. The Integrated Food Security Strategy (IFSS), introduced in 2002 based on public and private civil society partnerships, focuses on household food security as the building block for national food security. One of the strategic approaches increases household food supplies by providing production support services to households' own food production. The food security objective is further supported by *Fetsa Tlala*, an integrated food production initiative introduced in 2013, which aims to produce staple foods on fallow land with agricultural potential in communal areas.

The Ilima/Letsema Programme implemented in 2008 aims to increase food production, particularly by smallholder farming. Through provincial departments, it finances mostly conditional grants for projects such as upgrading irrigation schemes and other infrastructure and on-farm investments to strengthen production capacity.

The Comprehensive Agricultural Support Programme (CASP) was founded to assist new beneficiaries of Land reform to access credit and means of support from commercial banks and the government-owned Land and Development Bank. The CASP focuses on providing on- and off-farm infrastructure and production inputs; targeted training, skills development and capacity building; marketing and business development and support; information and knowledge management; technical and advisory services; regulatory services; and financial services.

The Micro-finance Financial Institutions of South Africa (MAFISA) provides financial services to smallholders in the agriculture, forestry and fisheries sector. The objective of the scheme is to address the financial services needs of smallholders. Services provided through the scheme include production loans, the facilitation of MAFISA clients to save, and capacity building for member-owned financial institutions (intermediaries).

The Comprehensive Rural Development Programme (CRDP) launched in 2009 supports the development of rural areas through two main policy instruments, both related to the agricultural sector. The Rural

Infrastructure Development (RID) programme promotes investment in rural infrastructure providing access to basic services, particularly sanitation, irrigation and roads. The Rural Enterprise and Industrial Development (REID) policy, signed in 2017, aims to stimulate social transformation that is integrated with inclusive growth by harnessing the potential of the rural enterprise sector for sustainable development including employment and income generation in rural areas.

South Africa is a founding member of the SACU, a full customs union with a common external tariff. In 1994, South Africa became a member of the Southern African Development Community (SADC[2]). From 2012, the SADC free trade agreement (FTA) was fully implemented. Trade between South Africa and the European Union takes place under the SADC-EU Economic Partnership Agreement (EPA) regime. This is a free trade agreement between the SADC EPA States (comprised of all SACU Member States plus Mozambique) and the European Union. The most important benefit for South Africa is the enhanced market access for agricultural products such as sugar, wine, some dairy products, flowers, fruits and nuts as well their preparations. The Agreement has contributed to an increase in South Africa's exports of agricultural products to the European Union in recent years.

The Agreement establishing the African Continental Free Trade Agreement (AfCFTA) came into force on 30 May 2019. Member states committed to eliminate 90% of tariff lines over a five-year period and ten years for the "least developed countries". Negotiations to finalise outstanding issues are expected to be completed during 2022, along with the implementation the agreement in practice. The AfCFTA will bring together all 55 Member States of the African Union covering a market of more than 1.2 billion people, with a combined GDP of more than USD 3.4 trillion. In terms of numbers of participating countries, the AfCFTA will be the world's largest free trade area since the formation of the World Trade Organization.

South Africa is also a beneficiary of the US African Growth and Opportunity Act (AGOA), a non-reciprocal trade preference programme that grants eligible Sub-Saharan African countries duty-free, quota-free (DFQF) access to the United States for selected export products. AGOA was enacted in 2000 for eight years. The Act was extended to 2015, and further to 2025. AGOA has a positive impact on some of South Africa's agricultural sub-sectors, in particular exports of wine, macadamia nuts and oranges.

Climate change mitigation policies in agriculture

Total GHG emissions in South Africa amounted to 482 $MtCO_2eq$ in 2017, and agriculture contributed 10.0% of these.

Climate change mitigation goals and priorities for South Africa adopted by Cabinet are documented in the revised NDC, the Climate Change Bill and South Africa's negotiating position for COP26**.** A signatory to the 2016 Paris Agreement on Climate Change, South Africa committed to reduce its GHG emissions. As outlined in its NDC updated in September 2021, the country set economy-wide mitigation targets for 2025 and 2030, which represent a 0-17% reduction and a 12-32% reduction, respectively, against the same business-as-usual range of 398-614 $MtCO_2eq$, per each reference year. Sector-specific mitigation targets are not set in the NDC.

The policy instrument currently in place to deliver South Africa's mitigation commitments is the national carbon tax (established by the Carbon Tax Act in August 2017), being implemented via a phase-in approach. The current Phase 1 covers 2019-22 and exempts primary agriculture from the carbon tax. This exclusion might be reconsidered for Phase 2 (after 2022).

If it is passed into law, the Climate Change Bill approved by Cabinet in September 2021 will serve as the legal framework for action on climate change and guide stakeholders to optimal pathways to a net-zero emissions economy by 2050. It includes a mandatory carbon budget programme and the establishment of sectoral emission targets (SETs) (Republic of South Africa, 2021). The SETs will be implemented through national government departments' planning instruments, referred to as Policies and Measures (PAMs).

Once the Climate Change Bill becomes law, SETs will be defined and allocated for three rolling five-year periods.

Additional policies pertaining to agriculture were developed with the objective that at least 30% of agricultural land is under sustainable land management, including climate-smart practices. These include: the Climate Smart Agriculture Strategic Framework & Climate Change Adaptation and Mitigation Plan, including departmental policies related to climate change developed and approved by the national department and sector; guidelines for the implementation of climate change agricultural sector policies, plans and strategies by provinces; and Climate Change Adaptation and Mitigation programmes developed to implement sector policies, plans and strategies (including, research, education, awareness and capacity building programmes). These should contribute to the SET for agriculture once it is formalised.

Domestic policy developments in 2021-22

Land reform and development

In order for the government to use the expropriation of commercial farms without compensation as an option for accelerating land redistribution, the South African Constitution would need to be changed. Accordingly, the Constitution 18th Amendment Bill – Section 25, was introduced to amend Section 25 of the Constitution (property rights) to provide for expropriation without compensation in circumstances deemed just and equitable (Saxby, 2021[3]). However, the Bill failed to reach a sufficient majority to be passed by the National Assembly on 7 December 2021.

The Land Court Bill was introduced to the National Assembly on 19 May 2021. It proposes to establish two new courts to provide administration and judicial functions such as mediation and arbitration procedures, including matters related to expropriation without compensation. However, since the amendment of the Constitution was unable to capture the majority votes for it to pass Parliament, the remaining Expropriation Bill is still under Parliament's consideration.

The national budget item on Agriculture, Land Reform and Rural Development (Vote 29), passed into law by the National Assembly in 2021, aims to provide equitable access to land, integrated rural development, sustainable agriculture and food security for all. It provides the Department of Agriculture, Land Reform and Rural Development (DALRRD) with resources and a mandate to develop agricultural value chains, provide agricultural inputs, and facilitate rural development.

The budget item on Agriculture, Land Reform and Rural Development is informed by DALRRD medium-term strategy, and it focuses on implementing the Agriculture and Agro-processing Master Plan (AAMP). Once finalised, the AAMP aims to improve agricultural production and revitalise essential agricultural infrastructure, and accelerate land reform. All of the Department's programmes are being aligned with the AAMP. The Department's expenditure is expected to increase at an average annual rate of 4.5% from ZAR 15.2 billion (USD 1.0 billion) in 2020-21 to ZAR 17.4 billion (USD 1.2 billion) in 2023-24.

DALRRD re-launched the Blended Finance Scheme (BFS) in March 2021 to leverage private funding to support investments that will enhance agricultural production, agro-processing and land acquisition by black producers. National Treasury has endorsed the collaboration between DALRRD and the Industrial Development Corporation (IDC) collaboration and agreed to a seed funding of ZAR 200 million (USD 13.5 million) in 2020/21; and National Treasury has provided the baseline allocation for BFS of ZAR 1.1 billion (USD 74.4 million) over MTEF 2021–2023/24 period.

Water

On 9 November 2021, the Supreme Court of Appeal (SCA) ruled on the transfer on water rights and that water rights holders are entitled to transfer such rights in accordance with the National Water Act (NWA) (Arnoldi, 2021[4]). This is an important ruling for the agricultural sector as it will allow the transfer of water

rights between water users in the agricultural sector. Following the SCA's ruling on the matter the Department of Water and Sanitation filed an appeal to the Constitutional Court against the decision (Arnoldi, 2021[4]).

Other policies

On 18 March 2021, the Minister of Agriculture, Land Reform and Rural Development and the Minister of Trade and Industry launched the **Agri-Industrial Fund** with the IDC (DALRRD, 2021[5]), to support economically viable activities in agro-processing (food and non-food) sectors (IDC, 2021[6]). The ZAR 1 billion (USD 67.6 million) fund supports the development and expansion of the agricultural sector by assisting black producers and investees in developing, expanding, acquiring and integrating operations in prioritised value chains. It also aims to accelerate land redistribution, increase exports and contribute to job creation. The fund will also aim to eliminate barriers to entry by providing grants to qualifying beneficiaries (DALRRD, 2021[5]).

Institutional change

The President has assented to the 1991 Upgrading of Land Tenure Rights Act on 26 May 2021. The Act provides for the application for conversion of land tenure rights to ownership in addition to offering interested persons applications to enable converting land tenure rights into ownership. The Act further provides an opportunity for interested persons to object to conversion of land tenure rights into ownership. The Act supports aggrieved persons to apply for appropriate relief in courts, and provides recognition of conversions that took effect in good faith in the past (Government Gazette, 2021[7]).

Domestic policy responses to the COVID-19 pandemic

The Solidarity Fund Food Relief came into effect on 23 March 2020, primarily as a result of COVID-19, and is a short-term intervention measure to respond to the COVID-19 crisis working closely with government and business but is independent of both of them (Solidarity Fund, 2020[8]). The Fund provides a platform for both the public and private sectors to contribute towards the various initiatives supported by the Fund. Donations made to organisations established to carry out benefits for the public are generally exempt from donations tax. The fund aims to provide accelerated aid for South Africa's most vulnerable households and communities during the COVID-19 pandemic (Solidarity Fund, 2020[8]). The fund is organised around three pillars, namely health, humanitarian efforts and communication. The humanitarian pillar encompasses, amongst others, provision of food parcels, food vouchers and farming input vouchers. In July 2021 the Humanitarian Crisis Relief Fund (HCRF) was created in response to the looting that occurred in KwaZulu-Natal (KZN) and Gauteng to ensure that families receive food.

The Farming Input Voucher Relief Programme issued 46 864 vouchers by 31 May 2021 to rural subsistence farmers in all nine provinces in South Africa to the value of ZAR 74.5 million (USD 5.0 million) (Solidarity Fund, 2021[9]). The efficacy of the farming input voucher programme was hampered by competing initiatives, such as the Presidential Employment Stimulus Initiative (PESI). The PESI initiative identified the same input suppliers as the fund that exacerbated problems such as stock availability.

PESI is intended to address unemployment challenges and sustain self-employment for subsistence producers. Beneficiaries of the programme would receive financial support ranging between ZAR 1 000 (USD 68) and ZAR 12 000 (USD 812) (Masiwa, 2021[10]). The first phase of the PESI programme supported 88 251 subsistence farmers. The programme was suspended on 12 January 2022 on the grounds of inflated fees charged to subsistence farmers when procuring goods with the vouchers (Masiwa, 2022[11]).

The Humanitarian Crisis Relief Fund (HCRF) is set up as a separate from the Solidarity Fund COVID response. According to the Solidarity Fund (2021), ZAR 100 million (USD 6.8 million) as part of the HCRF

was allocated for the procurement, packaging and distribution of food parcels in the KZN and Gauteng by the Department of Social Development (DSD) Food Relief Response.

After a first ban on the sale of alcohol from stores, restaurants and bars between 28 December 2020 and 15 January 2021, total bans on the sale of alcohol were imposed five times during 2021 in response to surging case numbers of COVID-19. These bans were introduced for the purpose of reducing infection rates and to alleviate the strain placed on hospitals by the admission of patients with alcohol-related injuries, and to ensure sufficient hospital resources would be available to cope with surging hospitalisations of COVID-19 patients. There was a cumulative period of 26 weeks over which the sale of alcohol was totally banned. There were an additional 9 weeks over which alcohol could only be purchased and consumed onsite in licenced premises.

The Loan Guarantee Scheme (LGS) is part of the Economic Stimulus Package to support small and medium-sized businesses that have experienced financial difficulties as a result of the COVID-19 pandemic (South African Government, 2021[12]). The LGS was launched on 12 May 2020 by the National Treasury and the Reserve bank, alongside the Banking Association South Africa (BASA). The LGS was originally scheduled to expire in April 2021, but was extended to July 2021. As of March 2021 banks have approved ZAR 18.16 billion (USD 1.26 billion) comprising 14 827 loans.

Trade policy developments in 2021-22

For wheat and sugar South Africa applies a variable, formula based, import tariff reflecting the price changes on world markets. During the 2020-21 period, the wheat and sugar import tariffs were adjusted four and two times respectively, ending 55% lower for wheat and 17.5% lower for sugar compared to their levels for the 2019-20 period.

Safeguard duties, which have been applied to all EU countries since 2018, were scheduled to fall away entirely in March 2022. The rate was initially set at 35.3%, falling to 30% in March 2019, 25% in March 2020 and 15% in March 2021.

Tariffs were introduced that apply to over 30% of all imported chicken, but do not apply to the European Union and other SADC countries.

Anti-dumping duties[3] on bone-in chicken imports were renewed against the United Kingdom, Germany and the Netherlands for an additional five years on 23 August 2021. The duties, applicable to these countries, were supposed to expire on 26 February 2020, but the International Trade Administration Commission (ITAC) initiated a sunset review on 24 February 2020 and found that if anti-dumping tariffs were removed, material harm would fall upon the poultry industry. South Africa also imposed provisional anti-dumping duties on chicken imports from Brazil, Denmark, Ireland, Poland and Spain until June 2022.

A Tariff Rebate is in place, rebating the full anti-dumping duties on the importation of frozen bone-in cuts chicken meat, imported from or originating in the United States. The rebate is provided on first-come-first-see basis and is subject to an annual quota. For the 2020/21 Quota Year, the quota was increased from 68 590 tonnes to 69 972 tonnes. For the 2021/22 Quota Year, the government approved a further increase to 71 290 tonnes.

The AfCFTA agreement for preferential trade was originally due to start in 2021, but has been delay due to ongoing negotiations to finalise and outstanding issues. Despite this delay, South Africa has already published new tariff rates that apply under this agreement.

Contextual information

South Africa has the most industrialised and diversified economy in Africa, and the second largest economy (after Nigeria) on the African continent. With the largest GDP per capita of the continent, it ranks as an

upper middle-income country. However, income inequality is high and widespread poverty persists. South Africa has experienced a relatively moderate and decreasing level of inflation — bellow 5% in most recent years, with inflation targeting in the range of 3% to 6 %. However, a persistently high rate of unemployment remains an obstacle for alleviating poverty. The real GDP growth rate has been declining since 2011 and came close to zero in 2019. The GDP dropped by 10% to -6% in 2020, mainly because of the restriction of economic activities related to the COVID-19 measures, but it rebounded strongly in 2021 to 5% (Figure 24.5).

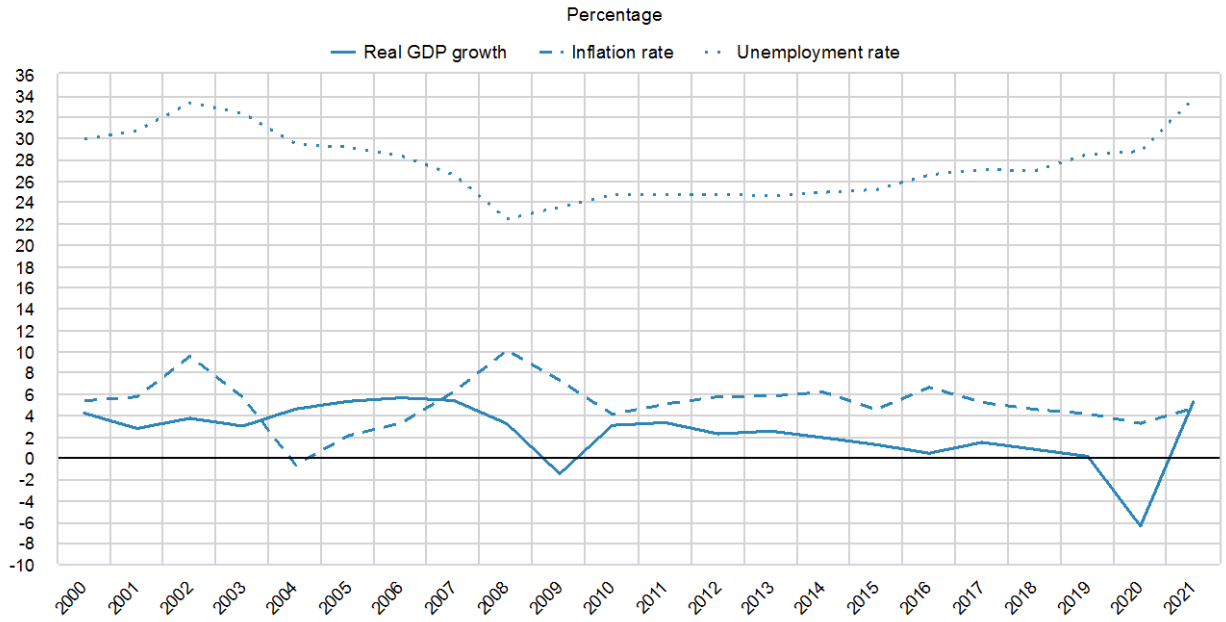
The importance of agriculture in the economy is relatively low, around 3% of GDP, and 5% of employment (Table 24.3). South Africa has abundant agricultural land, but only 13% of it is arable, while the remaining agricultural area is mostly semi-arid pastures with extensive livestock production. The farm structure is highly dualistic, with a well-developed and market oriented sector of large-scale commercial farms and a large number of smallholder farms.

Table 24.3. South Africa: Contextual indicators

	South Africa		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	347	717	0.9%	0.7%
Population (million)	44	58	1.0%	1.1%
Land area (thousand km²)	1 213	1 213	1.5%	1.5%
Agricultural area (AA) (thousand ha)	98 125	96 341	3.3%	3.3%
			All countries[1]	
Population density (inhabitants/km²)	37	49	53	63
GDP per capita (USD in PPPs)	7 715	12 096	9 281	20 929
Trade as % of GDP	19	25	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	3.3	2.7	2.9	4.9
Agriculture share in employment (%)	9.9	5.0	-	-
Agro-food exports (% of total exports)	8.5	12.1	6.2	8.5
Agro-food imports (% of total imports)	5.2	8.6	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	56	56	-	-
Livestock in total agricultural production (%)	44	44	-	-
Share of arable land in AA (%)	14	12	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

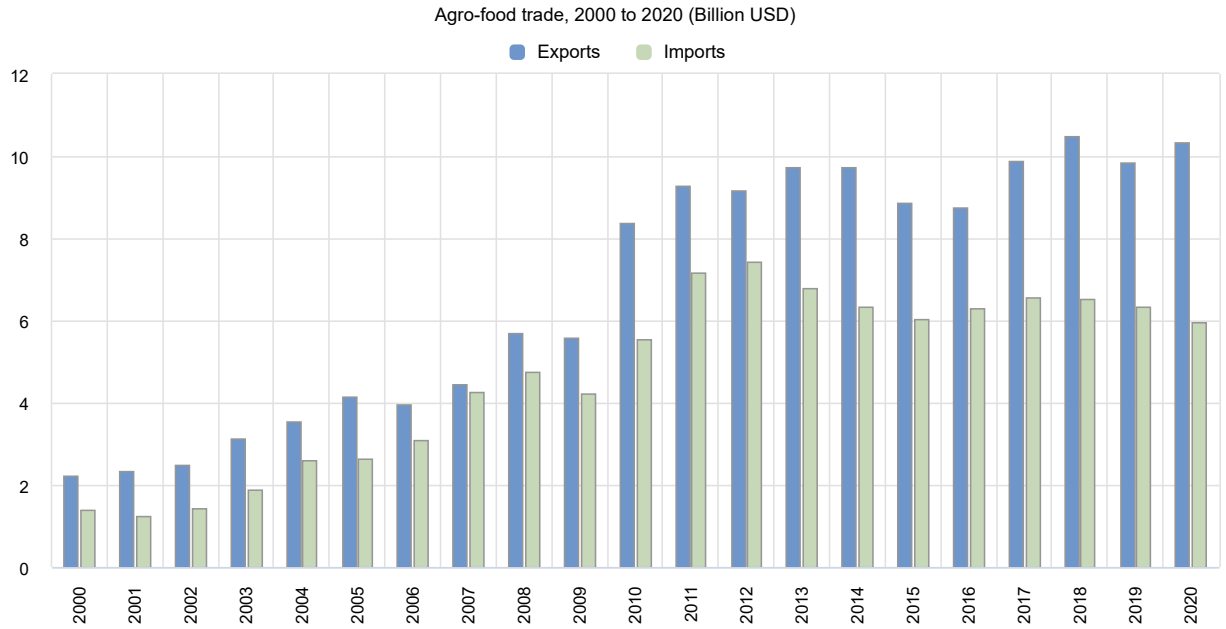
Figure 24.5. South Africa: Main economic indicators, 2000 to 2021

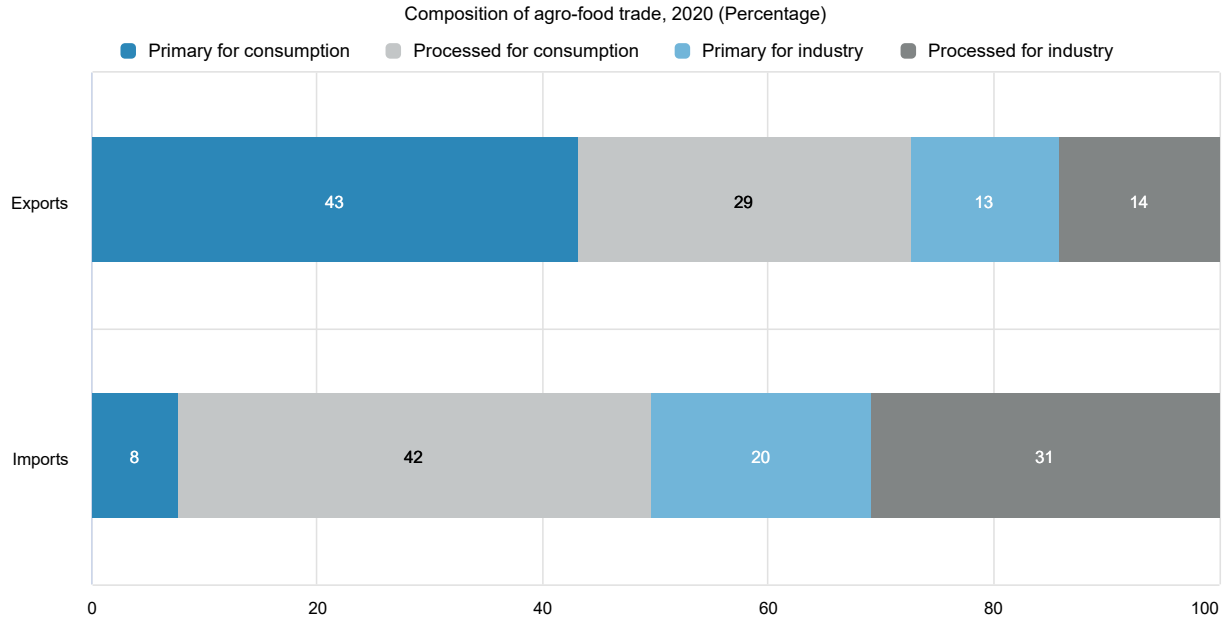


Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

South Africa is a consistent net exporter of agro-food products (Figure 24.6). The share of agro-food exports in total exports was around 12%, while the share of agro-food imports was around 9% in 2020 (Table 24.3). Nearly three-quarters of agro-food exports are for final consumption, both of primary and processed products. Around three-quarters of agro-food imports are processed products (Figure 24.6).

Figure 24.6. South Africa: Agro-food trade



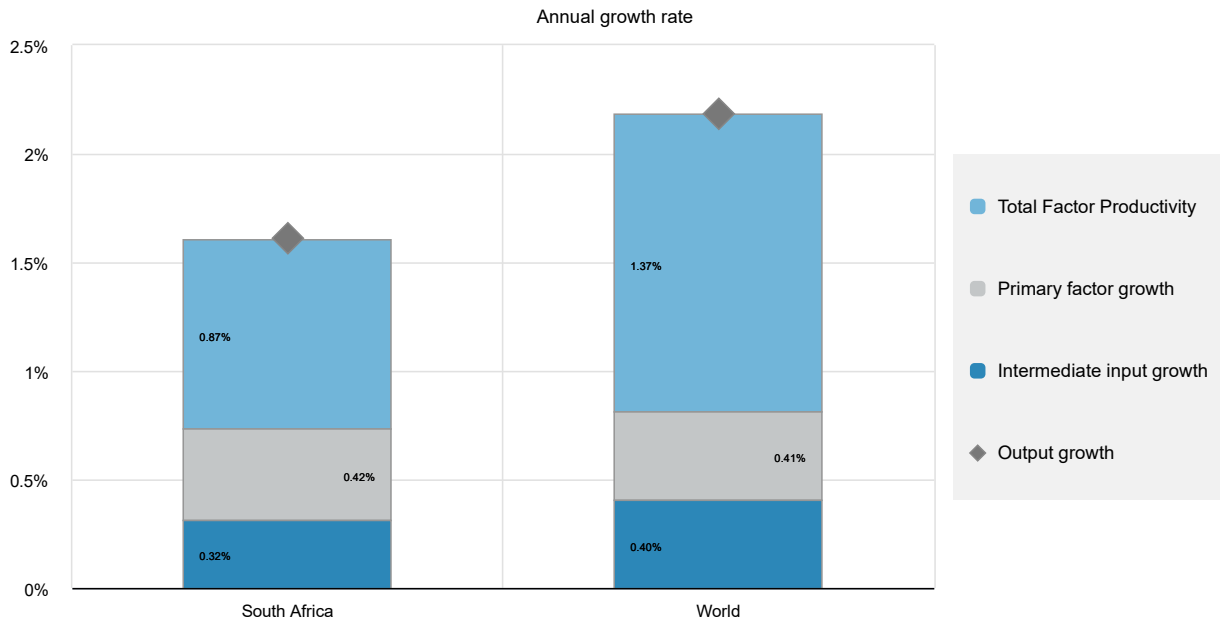


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Growth in total factor productivity (TFP) contributes most to agricultural output growth in South Africa (Figure 24.7). However, TFP growth has slowed significantly relative to the 1990s and averaged 0.9% per year during 2010-19. As with output growth overall, TFP growth has been well below the world average (Table 24.4). Increased use primary factors and moderate growth in intermediate input use also contributed to the increase in output (Figure 24.7).

Phosphorus and nitrogen balances are very low and negative, respectively, and well below the OECD average. Although agriculture uses almost 60% of abstracted water, only a few regions have irrigated land, and water resources are scarce in most of the agricultural areas (Table 24.4). The livestock sector is another important user of water in agriculture. Agriculture's share in energy use has increased and remains above the OECD average.

Figure 24.7. South Africa: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 24.4. South Africa: Productivity and environmental indicators

	South Africa		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.7%	0.9%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	-6.3	-7.3	32.1	30.0
Phosphorus balance, kg/ha	0.2	0.3	3.4	2.9
Agriculture share of total energy use (%)	2.6	3.1	1.7	2.0
Agriculture share of GHG emissions (%)	..	..	8.6	9.7
Share of irrigated land in AA (%)	1.5	1.7	-	-
Share of agriculture in water abstractions (%)	61.5	57.9	46.3	43.7
Water stress indicator	41.7	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] The SACU members are: Botswana, Lesotho, Namibia, Eswatini (former Swaziland) and South Africa.

[2] The SADC member countries are: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Eswatini, Tanzania, Zambia and Zimbabwe.

[3] The duties based on rated recommended by ITAC of 30.09% for bone-in chicken imports from the United Kingdom, 22.81% for the Netherlands and 73.33% for Germany, excluding certain exporters found not to be dumping.

25 Switzerland

Support to agriculture

Switzerland made moderate reductions in support to agriculture in past decades, but levels stabilised over the past ten years. Support to producers as a share of gross farm receipts remains high at 50% on average in 2019-21, almost three times the OECD average. However, changes in the structure of support have been pronounced, as direct payments replaced a substantial share of market price support (MPS).

MPS remains the main component of support, mostly in the form of tariff rate quotas (TRQs) with high out-of-quota tariffs. Over the past 30 years, MPS fell from 80% to around 50% of total producer support. Average domestic prices were 49% above world prices on average in 2019-21. The biggest price gaps (Producer Nominal Protection Coefficient) and shares of Single Commodity Transfers (SCT) in commodity gross farm receipts are for poultry, eggs, pig meat, rapeseed, beef and veal.

Switzerland provides significant direct payments to farms, almost all of which are subject to environmental cross-compliance. The share of total producer support increased from around 20% in the 1980s to almost 50% in recent years. Most are area payments to agricultural land not tied to a specific commodity, payments to maintain farming in less favoured conditions, and payments to farmers who apply stricter farming practices related to environmental and animal welfare.

Expenditures for general services (GSSE) are high in Switzerland. GSSE relative to agricultural production value rose from less than 6% in 2000-02 to more than 8% in 2019-21, among the highest of countries covered in this report. Almost half of GSSE expenditure goes to the agricultural knowledge and innovation system. Support to agriculture as a share of GDP fell from 2% in 2000-02 to 1% in 2019-21.

Recent policy changes

In March 2021, Switzerland's National Council confirmed the suspension of its agricultural reform legislative process (AP22+), initially planned to be in place from 2022. That reform, aimed at increasing value-added and productivity in the sector while strengthening protection of the environment and natural resources, will be reconsidered once the Federal Council delivers a more detailed assessment of the reform components and their expected impacts. The new policy is not expected to be in place before 2025. A CHF 14.02 billion (USD 15.3 billion) budget was agreed as a bridge for 2022-25, an increase of 0.6% over 2018-21.

In April 2021, an important package of measures on water quality, initially part of the agricultural reform, was submitted for consultation as separate legislation. The new measures, adopted in 2022, aim to reduce the risk associated with the use of some pesticides by 50% by 2027 compared to the 2012-15 average. They also set a minimum reduction target of 20% for nitrogen and phosphorus losses by 2030, and a 3.5% cropland set-aside for biodiversity protection. The entry into force of the latter measure was postponed to 2024 due to the international market situation. The annual set of ordinances from November 2021 also added cross-compliance elements related to liquid fertiliser management.

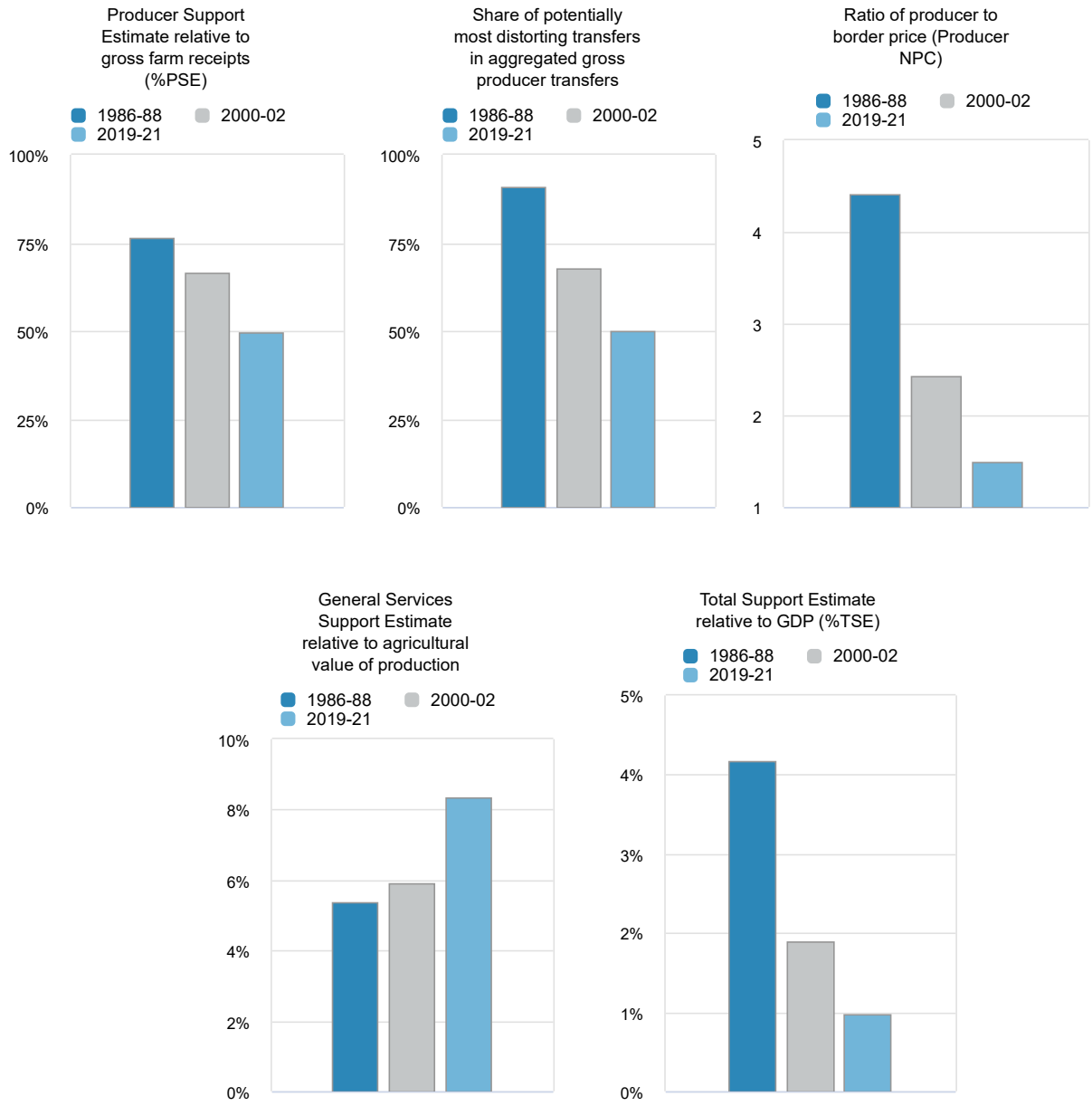
In January 2021, Switzerland submitted their Long-Term Strategy (LTS) on climate change, which targets a 40% reduction in greenhouse gas (GHG) emissions compared to 1990 for the agricultural sector by 2050, within a broader carbon neutrality objective for the country. The LTS specifies a minimum food production objective for Swiss agriculture of 50% of the national food supply by 2050. But a key piece of legislation to support the transition (the CO_2 Act revision) was rejected by referendum in June 2021, which leaves agriculture without a mid-term mitigation target and consistent policy instruments to implement the long-term commitments. Environmental measures already passed can contribute to specific mitigation efforts, but new proposals are expected from the Federal Council to address more fundamentally this issue.

In June 2021, the Federal Council adopted a 2030 Sustainable Development Strategy and related action plan with objectives for the food system. Four targets were introduced: (1) a 25% reduction in the GHG emissions footprint in consumed food by 2030 compared to 2020; (2) a one-third share of population with healthy and sustainable diets by 2030; (3) 50% less food waste per capita compared to 2017 by 2030 and substantial reduction in food losses; (4) a one-third increase in the share of farms engaged in especially environment- and animal-friendly production under public and private sustainability programmes by 2030 compared to 2020. Stakeholder discussions were held in the context of the Food Systems Dialogues to define a National Pathway for Food Systems Transformation in support of this Strategy. The action plan also envisages an actualisation of the Climate Strategy for Agriculture from 2011 by the end of 2022.

Assessment and recommendations

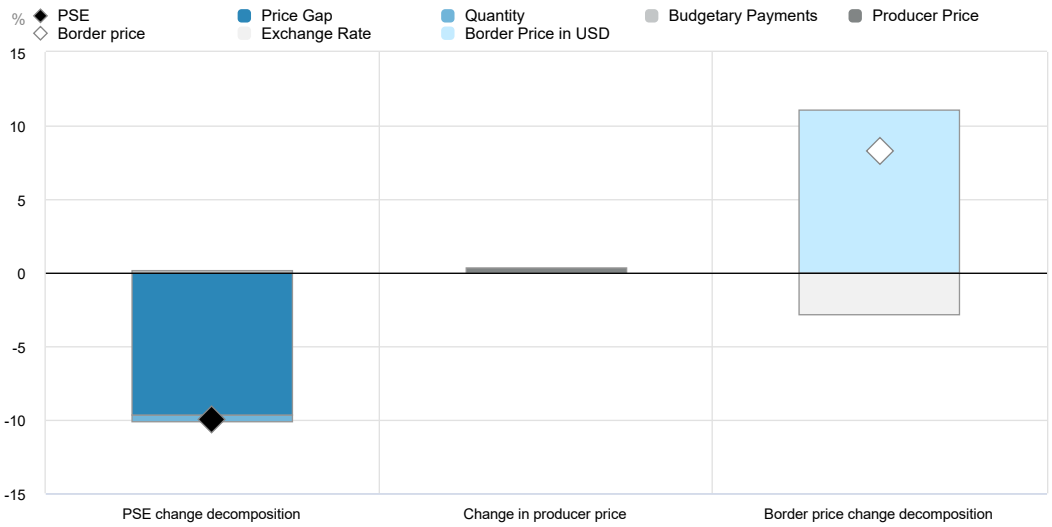
- The adoption of medium- to long-term emissions reduction targets for agriculture and food are positive steps on climate action, but the rejection of the revised CO_2 Act is less encouraging. A legislative counterproposal is quickly needed to ensure that national climate mitigation plans remain aligned with the Paris agreement commitments and that efforts in agriculture are consistent with a broad cross-sectoral strategy.
- More generally, the objectives of the AP22+ reform were designed to foster a more efficient agricultural sector, improving farm revenues and environmental benefits while preserving food security. The suspension of the legislative process should not undermine the initial ambition.
- While Switzerland reduced its share of most-distorting producer support over the past decades, border measures and output-based payments are still among the highest in the OECD. Continuing efforts to decouple income support from farm output would decrease pressure on the environment and strengthen competitiveness and resilience in the sector.
- Investments in more efficient production systems would support environmental and climate goals. Despite high support to agricultural knowledge and innovation systems, total factor productivity growth in Swiss agriculture stalled for the past decade.
- Large payments allocated to preserve the environment performed well in many domains, but did not reduce the nitrogen surplus – still twice the OECD average – which contributes to GHG emissions. The new clean water programme should help reduce fertiliser applications, but deeper structural changes would be needed.
- The need for early action on livestock should also be closely considered, as it generates most Swiss agricultural emissions. Without a medium-term plan specific to that sector, it will be difficult to align with the announced climate targets by 2050 and the Global Methane Pledge efforts.
- Switzerland puts food security at the core of its agricultural policy. However, the focus on animal products also leads to dependency on feed crop imports and worsens the country's calorie deficit. More balanced production would facilitate the achievement of nutritional objectives.

Figure 25.1. Switzerland: Development of support to agriculture



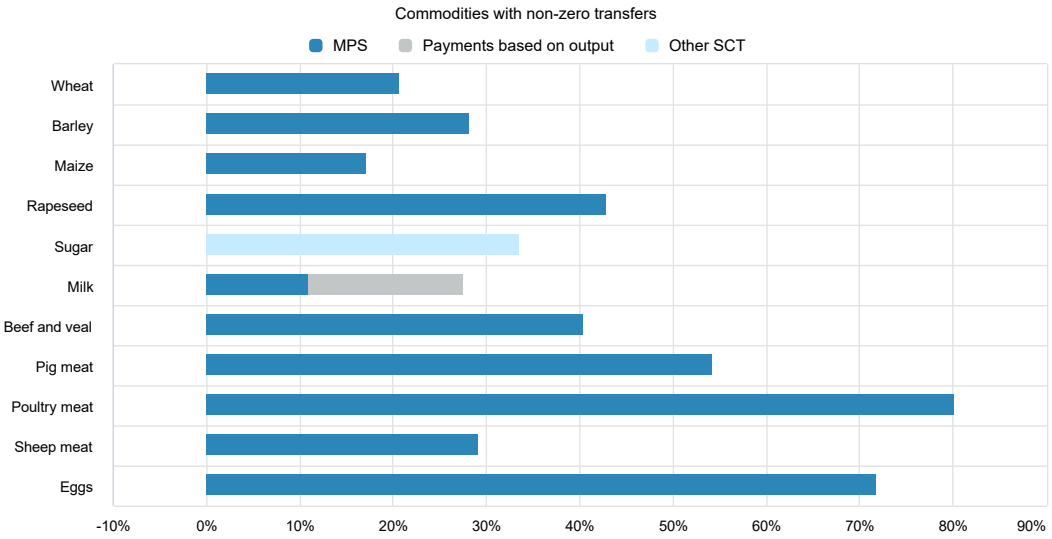
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 25.2. Switzerland: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 25.3. Switzerland: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 25.1. Switzerland: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**8 025**	**5 695**	**9 529**	**9 259**	**9 717**	**9 612**
of which: *share of MPS commodities (%)*	62.80	57.98	60.29	57.77	60.39	62.70
Total value of consumption (at farm gate)	**12 693**	**8 853**	**14 898**	**14 434**	**14 291**	**15 970**
Producer Support Estimate (PSE)	**6 871**	**5 054**	**6 586**	**6 076**	**7 108**	**6 574**
Support based on commodity output	5 966	3 361	3 226	2 862	3 721	3 095
Market Price Support[1]	5 939	3 142	2 830	2 488	3 325	2 677
Positive Market Price Support	5 939	3 142	2 830	2 488	3 325	2 677
Negative Market Price Support	0	0	0	0	0	0
Payments based on output	27	218	396	374	396	418
Payments based on input use	358	126	152	146	150	158
Based on variable input use	289	67	70	67	71	73
with input constraints	0	14	0	0	0	0
Based on fixed capital formation	46	53	81	79	79	86
with input constraints	0	0	42	37	42	47
Based on on-farm services	23	6	0	0	0	0
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	392	564	1 050	995	1 060	1 094
Based on Receipts / Income	10	0	0	0	0	0
Based on Area planted / Animal numbers	382	564	1 050	995	1 060	1 094
with input constraints	217	540	1 000	946	1 008	1 044
Payments based on non-current A/An/R/I, production required	18	51	1 103	1 054	1 111	1 142
Payments based on non-current A/An/R/I, production not required	0	774	90	105	91	73
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	774	90	105	91	73
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	58	753	708	760	790
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	58	753	708	760	790
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	137	120	214	204	215	221
Percentage PSE (%)	**76.60**	**66.40**	**49.54**	**47.30**	**52.65**	**48.66**
Producer NPC (coeff.)	**4.41**	**2.43**	**1.49**	**1.43**	**1.60**	**1.45**
Producer NAC (coeff.)	**4.27**	**2.98**	**1.98**	**1.90**	**2.11**	**1.95**
General Services Support Estimate (GSSE)	**431**	**337**	**798**	**752**	**805**	**836**
Agricultural knowledge and innovation system	110	70	395	370	402	413
Inspection and control	9	24	12	11	11	13
Development and maintenance of infrastructure	80	54	87	83	86	92
Marketing and promotion	29	37	68	63	67	73
Cost of public stockholding	66	32	48	45	49	51
Miscellaneous	137	120	188	179	190	195
Percentage GSSE (% of TSE)	**5.41**	**6.09**	**10.79**	**11.00**	**10.14**	**11.28**
Consumer Support Estimate (CSE)	**-9 012**	**-5 032**	**-4 574**	**-4 127**	**-5 050**	**-4 547**
Transfers to producers from consumers	-6 065	-3 243	-2 855	-2 511	-3 361	-2 692
Other transfers from consumers	-3 788	-1 986	-1 746	-1 636	-1 737	-1 865
Transfers to consumers from taxpayers	700	147	10	5	19	5
Excess feed cost	141	50	17	15	29	6
Percentage CSE (%)	**-75.00**	**-57.80**	**-30.71**	**-28.60**	**-35.38**	**-28.48**
Consumer NPC (coeff.)	**4.44**	**2.44**	**1.45**	**1.40**	**1.55**	**1.40**
Consumer NAC (coeff.)	**4.00**	**2.37**	**1.44**	**1.40**	**1.55**	**1.40**
Total Support Estimate (TSE)	**8 002**	**5 538**	**7 393**	**6 832**	**7 932**	**7 416**
Transfers from consumers	9 853	5 229	4 601	4 147	5 098	4 558
Transfers from taxpayers	1 937	2 296	4 538	4 321	4 571	4 724
Budget revenues	-3 788	-1 986	-1 746	-1 636	-1 737	-1 865
Percentage TSE (% of GDP)	**4.18**	**1.89**	**0.97**	**0.93**	**1.05**	**0.92**
Total Budgetary Support Estimate (TBSE)	**2 063**	**2 396**	**4 563**	**4 344**	**4 607**	**4 739**
Percentage TBSE (% of GDP)	**1.08**	**0.82**	**0.60**	**0.59**	**0.61**	**0.59**
GDP deflator (1986-88=100)	**100**	**127**	**136**	**136**	**135**	**137**
Exchange rate (national currency per USD)	**1.58**	**1.64**	**0.95**	**0.99**	**0.94**	**0.91**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Switzerland are: wheat, maize, barley, rapeseed, sugar, milk, beef and veal, sheep meat, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Until the early 1990s, high trade barriers and strong domestic market regulations isolated Swiss agriculture from world markets. Substantial reforms of agricultural policy were implemented in the mid-1990s and early 2000s. These were prompted by commitments made under the GATT and later the WTO. There have been no systematic policy reforms since 2013, and current schemes are expected to extend until at least 2025.

The reforms implemented between 1993 and 2003 had three main elements:

1. Reduction and transparency improvement in import protection, gradual removal of price guarantees and other market regulations, maintenance of production quotas for milk, and introduction (in 1998) of new market regulations for sugar.
2. New direct payments less coupled to production, and voluntary ecological direct payments linked to ecological services (1993-1998).
3. Cross-compliance requirements connecting almost all direct payments to proof of ecological performance as of 1999.

Between 2004 and 2013, policy reforms were comparatively modest and focussed on deregulation of agricultural markets. Export subsidies were phased out, and milk quotas were abandoned in 2009 even though the market remained strongly regulated. In 2013, Switzerland adopted a new policy framework for 2014-17 (AP 2014-17) that was later extended and remains in place (OECD, 2015[1]). This framework amended the direct payment scheme to improve its efficiency and effectiveness and set up a system of direct payments linked to specific agricultural practices (OECD, 2017[2]). A new policy reform for 2022 onward, called AP22+, has been in discussion over the past years and would strengthen the environmental policy objectives. However, the legislative process was suspended, and its entry into force is not expected before 2025. Some first environmental reforms associated to the new policy scheme are being implemented separately (regulations on pesticide and nutrient surpluses, strengthened cross-compliance requirements and budgetary support for sustainable practices).

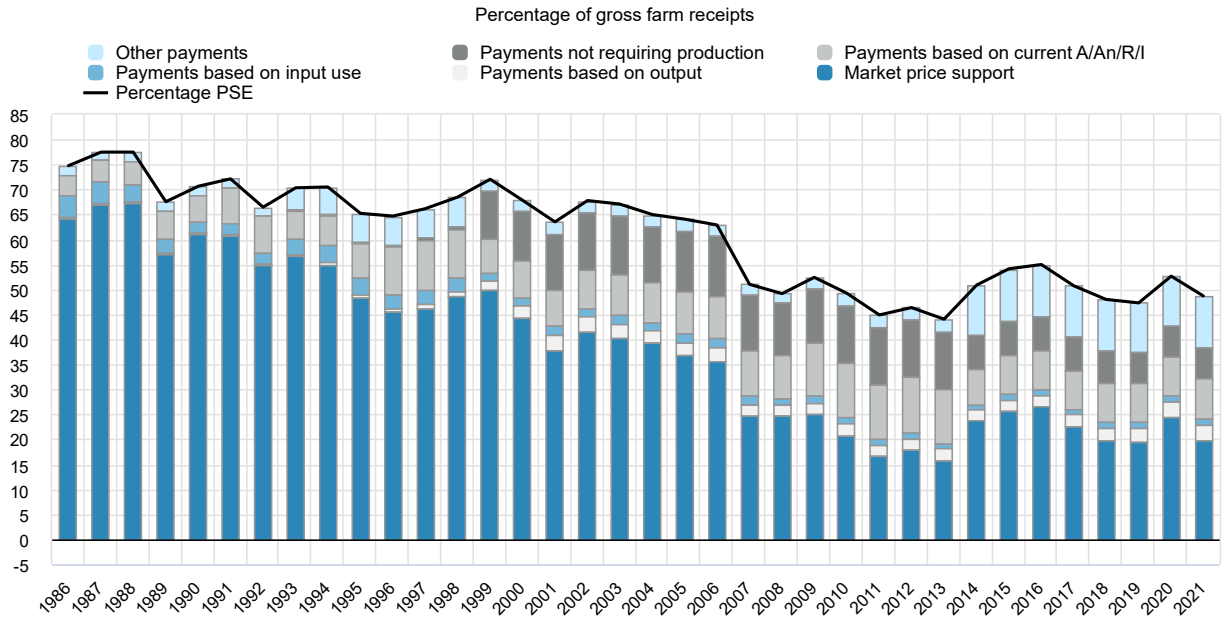
Table 25.2. Switzerland: Agricultural policy trends

Period	Framework	Changes in agricultural policies
Prior to 1993	Closed market	High border protection; regulated prices and interventions in domestic agricultural markets Payments based on output and input use; commodity-specific area and headage payments
1993-1998	Reforms to open up markets New system of direct payments	Reduced import barriers; enhanced transparency Reduction of export subsidies for some agricultural and processed products Reduction of domestic market regulations except for milk (production quotas); introduction of sugar production quotas and guaranteed prices Creation of General Direct Payments, including: - Complementary Direct Payments based on area (arable and grassland) and other supplementary payments - Payments for integrated production - Payments for farming in difficult conditions Introduction of Ecological Direct Payments as voluntary schemes based on environmental services provided by farmers (biodiversity, landscape, animal welfare, etc.), and incentives for more sustainable use of resources and pollution reduction
1999-2004	Continuation of reforms to open up markets Changes in the system of direct payments	Further gradual reduction of import barriers Reform of the General Direct Payments; Complementary Direct Payments replaced by a general Area Payment not requiring production of particular crops; introduction of a general payment for ruminants Abolition of payments for integrated production Introduction of environmental cross-compliance; all direct payments conditional to a proof of ecological requirements

Period	Framework	Changes in agricultural policies
2005-2013	Abolition of export subsidies Removal of production quotas (dairy, sugar)	Further gradual reduction of import barriers Abolition of export subsidies for primary agricultural products (2010) Abolition of dairy quotas and related guarantee prices for milk (2009) Abolition of sugar market regulations and introduction of area payments for sugar-beet to compensate for related price reductions (2009)
2014-present	Reform of the general direct payments	Reform of the system of General Direct Payments (2014) Abolition of general area payments Reallocation of payments related to specific agricultural practices Introduction of transition payments to make the reform socially acceptable Replacement of general headage payments to ruminants with area payments to pastures with a minimum stocking density Continuation of environmental cross-compliance conditions within the new system of payments Abolition of remaining export subsidies for some processed products (1 January 2019) New payments to producers of commercial milk and grains to compensate for price reductions due to the abolition of export subsidies for processed products (2019)

Support to farmers declined from close to 80% of gross farm receipts in the late 1980s to slightly less than 50% in 2021. Potentially most production- and trade-distorting support (mainly market price support) also declined from around 80% to less than 50% of producer support between 1986 and 2021, while other payments grew.

Figure 25.4. Switzerland: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Swiss agricultural policy is conducted under the framework of the Agriculture Act (AgricA) from 1998, which establishes the principles and instruments governing the regulation of the sector. The AgricA aims at ensuring a sustainable agriculture, oriented towards environmental performance and innovation, and articulated around the following components: i) food security for the population, ii) natural resources conservation, iii) cultivated landscape maintenance, iv) decentralised land occupation, v) animal welfare.

The key elements of the AgricA have been enshrined in the Swiss Federal Constitution (Art. 104) and in 2017, a referendum led to the adoption of a new article on food security (Art. 104a), emphasising the need to guarantee the supply of food to the population through:

- safeguarding agricultural production basis, especially land
- adapting food production to local conditions and using natural resources efficiently
- ensuring that the agriculture and food sector responds to market requirements
- building trade relationships that contribute to the sustainable development of the agriculture and food sector
- using food in a way that conserves natural resources.

The Constitution and the AgricA require securing sufficient long-term food supplies for the population, based on both domestic production and imports and considering the entire value chain. This is achieved through specific measures developed within four-year budget and programme cycles.

The current regulation is based on the new agricultural budget for the period 2022-25 (AP 2022-25), which follows on the AP 2018-21 that covered the past four years. These successive plans extend the policy framework that revised the system of direct payments in 2014. The budget allocation for AP 2018-21 was 1.5% lower in nominal terms than for AP 2014-17, whereas the new 2022-25 budget is 0.6% higher, compared to AP 2018-21.

Budgetary support to agriculture consists of three broad financial envelopes. These are direct payments, production and marketing expenditures, and support improving the production base combined with social measures.

Direct payments to farmers target primarily food security and environmental services (landscape, biodiversity, sustainable use of resources) and animal welfare. These payments are additionally subject to environmental cross-compliance conditions.

Production and marketing expenditures mainly support dairy producers via three types of payments: (1) for milk delivered for cheese processing; (2) for milk production without silage feed; and (3) for commercial milk (introduced in 2019). In addition, area payments apply to oilseeds, protein crops, grain (introduced in 2019) and sugar beet. Some expenditures under this heading also provide funds for general services to the sector, including marketing and product promotion.

Policies to improve the production base and social measures include direct support to farm investments as well as general support for infrastructure improvement, social aid to farmers, and advisory services. These payments were initiated as part of the AP 2014-17 policy framework, and continued in subsequent periods.

Some markets are also subject to specific regulations. Following the abolition of milk quotas in 2009, the inter-branch organisation for milk, *l'Interprofession du Lait* (IP Lait), implemented standard milk delivery contracts for its members. These set different prices and volumes for milk delivery (contingents A, B and C). Since 2013, these contracts are compulsory for all milk producers including those outside IP Lait, which means that the previous production quota system was de facto replaced by another production control mechanism on a private basis. This scheme was extended in 2021 by the Federal Council.

Agro-food imports to Switzerland are, to a large extent, regulated by tariff rate quotas with relatively low in-quota tariffs and high out-of-quota tariffs. In particular, TRQs cover meat, milk products, potatoes, fruits, vegetables, bread cereals and wine. Since 1999, an auctioning system allocates some of the TRQs to traders. A notable exception to the quota system is feed grains, which are subject to single tariffs. These are regularly adjusted depending on market conditions to ensure that protection does not lead to unbearable feed prices for the livestock sector.

Preferential tariff rates apply unilaterally to imports from developing countries under the general system of preferences. The Swiss Government grants zero tariffs to all products from Least Developed Countries (LDCs), so agricultural imports from LDCs (according to the official UN definition) are duty- and quota-free since September 2009.

Export subsidies for primary agricultural products were eliminated by 1 January 2010. The remaining export subsidies for some processed products were abolished as of 1 January 2019. Subsequently, additional payments to producers for commercial milk (Agriculture Act Art. 40) and grain (Agriculture Act Art. 55) were introduced.

Switzerland's network of trade agreements consists of the European Free Trade Association (EFTA) Convention, the Free Trade Agreement with the European Union and some 33 agreements concluded with 43 countries. All were signed within EFTA, with the exception of agreements with the People's Republic of China, Japan and the Faroe Islands.

Climate change mitigation policies in agriculture

In 2019, agriculture contributed 12.7% (5.9 $MtCO_2eq$) to GHG emissions in Switzerland, mostly due to livestock farming. These are 12% lower than in 1990, but remain relatively stable since 2000.

Switzerland recently announced its intent to reach climate neutrality by 2050 and made new commitments for emissions reductions in the agricultural sector. The Long-Term Strategy (LTS), submitted to the UNFCCC in January 2021, targets 40% emission reduction for agriculture compared to 1990 by 2050. This represents greater ambition from the previous 33% reduction target set in 2011 as part of the Climate Strategy for Agriculture, a first framework for adaptation and mitigation for the sector. The LTS also defines a minimum food production objective for Swiss agriculture of 50% of the national food supply by 2050. However, no emission reduction target was assigned to the agricultural sector in legislation to date. An objective was proposed in the context of the CO_2 Act revision (20-25% reduction for agriculture compared to 1990 by 2030), but this was rejected by referendum in June 2021. A new proposal is expected from the Federal Council for the CO_2 Act revision that will define the new climate policy reflecting Swiss international commitments: 50% reduction at national level by 2030 according to Swiss NDC, three-quarters of which should be realized domestically without offsets.

Additional objectives were defined for the food sector as a whole. In 2011, the Climate Strategy for Agriculture set a reduction target of two-thirds of total food production emissions compared to 1990 by 2050. Shorter-term targets were introduced in June 2021 as part of the 2030 Sustainable Development Strategy. Within the sustainable consumption domain, that strategy called for a 25% reduction compared to 2020 of each food consumer GHG emission footprint by 2030. This includes domestic emissions and those in food imports.

The Climate Strategy for Agriculture of 2011 sets out action areas where specific objectives could be assigned to support mitigation. These are in the livestock sector (breed, herd management, animal feed, animal building), the crop sector (crop and variety type, management practices), fertiliser management (application rate, storage and spreading), and energy consumption (building, machinery and renewable energy). AP22+ was expected to develop actions in these areas but was suspended in 2021 following concerns by Parliament (details below). Nonetheless, legislation changes were passed in 2021, including for water quality, which will support mitigation of fertiliser emissions.

Current and new measures that target climate mitigation in agriculture are:

- Better control of nutrient losses from fertilisers. The new water quality plan adopted in 2022 introduces a minimum reduction target of 20% for fertiliser nitrogen and phosphorus losses by 2030. In addition, the tolerance margin of 10% for measurement of manure application will no longer apply from 2024, meaning fertiliser inputs should remain below 100% of the land nutrient needs to respect environmental cross-compliance for direct payments.
- Strengthened contributions to sustainable production systems from 2023 through: (1) soil fertility improvement measures, benefitting soil carbon stocks; (2) more efficient nitrogen use, relying more on organic fertilisers; (3) longer productive lifetime for cows, which should reduce emissions per unit of output.
- The obligation from 2024 to spread liquid farmyard manure with a low emission rate. The regulation of storage and spreading of farmyard manure will be added to the cross-compliance requirements.
- A carbon tax on fossil fuels used to heat greenhouses and barns for livestock, as set out by the 2011 version of the CO_2 Act. The future level of this tax (CHF 120 per tonne CO_2 in 2022) remains uncertain following rejection of the CO_2 Act revision by Swiss voters in 2021. Transportation fuels are not subject to the carbon tax. Producers can opt out from the tax payment by submitting a long-term decarbonisation plan for their installations.
- A requirement for fossil fuel producers and importers to offset part of transport-related CO_2 emissions through national emissions reductions projects. Domestic agricultural projects can contribute to these with investments in anaerobic digesters or fertilisation improvements.

Initiatives are also in place to foster R&D, knowledge dissemination and innovation. These fund information platforms, association initiatives for climate protection in agriculture, or development of sustainability schemes.

The LTS highlights other areas that could deliver better mitigation outcomes. Agricultural emissions (including energy consumption and soil carbon) could be reduced from 7.1 $MtCO_2eq$ today to 4.1 $MtCO_2eq$ by 2050 thanks to 1.6 $MtCO_2eq$ saved through changes in consumption and production patterns, and a 1.4 $MtCO_2eq$ reduction distributed between efforts in livestock, energy use, fertilizer management and soil carbon. The LTS emphasises trade-offs for the Swiss agricultural model and refrains from providing specific details on the implication for food production or the development of the livestock sector. Measures on the consumer side are highlighted as a way to reduce pressure from future food demand, in particular dietary changes and food waste reduction.

Domestic policy developments in 2021-22

In March 2021, the National Council confirmed the **suspension of the agricultural policy reform AP22+ legislative process**. This decision followed a similar vote from the Council of States in December 2020, in response to the Federal Council reform proposal. The main objectives of this reform were to increase the value added of Swiss agricultural products by improving efficiency of production, tightening environmental legislation and protecting further natural resources. The Parliament expressed concerns regarding the consequences of the reform for food security and its economic impact on the sector, deciding to postpone the reform to allow more in-depth review of its potential impacts.

To better support the legislation proposal, the Parliament has asked the Federal Council to submit a report in 2022 examining the following aspects of the reform: i) the measures guaranteeing the country self-sufficiency rate; ii) the broadening of scope to healthy and sustainable food production; iii) the closure of fertiliser nutrient cycles along the supply chain; iv) the simplification and restructuring of support instruments with lower administration costs and bureaucracy; v) the guarantee to the business environment and economic perspective for the sector; and vi) the reduction of competition distortions between imported and domestic production due to different legislations regarding production methods. In

February 2021, the National Council also requested that two additional issues be covered by the Federal Council's report: vii) the promotion of direct sales and short supply chains, and viii) measures limiting food waste.

To bridge the gap left by the policy reform suspension, the Council of States voted a **new budget for the period 2022-25** with a similar structure as for the 2018-21 period. The total financial envelope amounts to CHF 14.02 billion (USD 15.3 billion) and includes CHF 11.25 billion in direct payments, CHF 2.22 billion in production and marketing support, and CHF 0.55 billion in production base support.

Some environmental legislations initially part of the AP22+ reform were adopted separately. In April 2021, a set of new measures to protect water resource quality were submitted for consultation. These responded to some popular initiatives calling for stricter environmental regulation on water quality. They included a modification of the **measures regulating the risks associated with phytosanitary product application**. The new measures, adopted in April 2022, aim to reduce the risk associated with some pesticides use by 50% by 2027, compared to the average level in 2012-15. Producers must avoid using some products – classified as high potential risk – to remain eligible for direct payments. The new measures also set a minimum reduction target of 20% for nitrogen and phosphorus losses by 2030 (see climate mitigation section). In addition, farmers should dedicate 3.5% of their cropland area to the promotion of biodiversity. The latter measure, initially expected to enter into force in January 2023, was postponed to 2024 in response to the market tensions due to the Russian aggression against Ukraine.

Following the new water protection legislation proposal and in line with the recommendations of the Federal Council and the Parliament, two popular initiatives proposing stricter rules on clean drinking water and pesticide use were rejected on 13 June 2021 by Swiss voters. The Swiss Government highlighted that taking stricter measures would present food security risks by weakening domestic production, and would redirect negative impacts abroad. Furthermore, the Federal Council released a report in September 2021 showing the impact of the previous 2017 policy package on phytosanitary product applications. A total of 29 out of 51 measures from that package had been introduced and farmers adapted their practices. In 2020, 21% of vineyard and fruit crops were cultivated without herbicide, as well as 16% of open cropland, compared to 5% in 2012.

With respect to the livestock sector, in May 2021 the Federal Council rejected another popular initiative against intensive livestock farming, as the targeted practices were already banned under current legislation for domestic production and could not apply to imported products owing to international trade regulations. However, the Council acknowledged the importance of animal welfare protection in Switzerland and proposed as an alternative to introduce an article on animal welfare covering all animal species into the Federal Constitution. In March 2022, that counter-proposal was however rejected by the Swiss Parliament.

To adapt livestock policies to evolving heath challenges, in June 2021 the Federal office of food safety and veterinary affairs also adopted a new **"Strategy on Animal Health Swiss 2022+"** setting the main goals of the policy on animal health and protection against epizooties, in the domain of prevention, crisis management, scientific research and international collaborations. Among the new priorities are an emphasis on zoonosis and the One Health approach, the broader use of digitalisation and data collection techniques, and strengthened collaborations with all actors of the sector.

More specific sectoral measures were also adopted in 2021. Border measures on sugar were extended by the Parliament until 2026 to protect Swiss sugar beet farmers from international competition. The Federal Council had advised against such extension due to the production cost implications and the consequences on employment in the food industry. Direct support measures were also extended until 2026 (CHF 2 100 per hectare), and a new premium (CHF 200) was introduced for cultivation of sugar beet under organic or integrated farming practices for 2022, to be maintained until 2026.

New ordinances were passed in November 2021 implementing some additional changes taking effect in January 2022. Hemp cultivation for seed consumption or industrial use will be subject to direct payments

as other annual crops, except for cannabidiol (CBD) use. Since 2021 hemp seed is no longer subject to the agricultural legislation on seeds, to facilitate its use for CBD production. New requirements also entered into force on storage and spreading of liquid fertilisers, as part of agro-ecological compliance, however, some requirements related to equipment conversion are postponed to 2024 to allow farmers to adjust. The Federal Council decided to keep the current level of support for milk at CHF 0.15 per kg despite the larger volume produced. In January 2022, the ordinances for proposed measures in 2023 were submitted for consultation. These include new sheep summering management rules to adapt to the expansion of predators such as wolves, and new support payments to protein crops for food consumption, such as chickpeas or lentils.

Agricultural data management improvements were made in 2021 by the Federal office of Agriculture. New software was deployed to simplify data transmission between farmers and the administration through a more secure environment. This new environment is expected to lower the administrative burden for farmers, give them easier access to historical records and facilitate information sharing with other entities such as label-granting organisations.

In April 2021 the Swiss centre for agricultural research, Agroscope, released a first report on the state of biodiversity on agricultural land based on the national monitoring program on species and habitat (ALL-EMA). Its main findings showed that species and habitat richness were too low in the plain regions where agricultural practices are most intensive. However, it also revealed that biodiversity promotion areas contained more biodiversity than other comparable areas, showing the efficacy of such measures to promote biodiversity on agricultural land. These results will be integrated to the discussions on future development of Swiss agricultural policies.

In December 2021, the Council of States also extended the moratorium on genetically modified organisms which will remained banned from production in Switzerland until end of 2025. An exception was however granted by the Parliament to the case of genetic editing, when no new genes are introduced in a genome of a crop. This follows the recommendation of the Consultative Council on Agriculture, who highlighted the opportunities of developing new crops which might reduce the use of phytosanitary products, be more environmentally-friendly and better adapted to climate changes.

More strategic moves were also taken related to long term developments. In June 2021, the Federal Council adopted its **2030 Sustainable Development Strategy** (SDS), as well as its related action plan. It identified three priority themes for which specific objectives were set for 2030: Sustainable consumption and production; Climate, energy and biodiversity; and Social equity. Four targets were assigned for the food system as part of the SDS Sustainable Consumption and Production theme:

- A reduction of one quarter in food GHG emissions footprint for Swiss consumer by 2030 compared to 2020 (already mentioned as part of climate policies).
- A share of one-third of total population with healthy and sustainable dietary patterns by 2030.
- A reduction of 50% in food waste per capita by 2030 compared to 2017, and a substantial reduction in food losses along the supply chain.
- An increase by one-third by 2030 in the share of farms engaged in especially environment- and animal-friendly production under public and private sustainability programmes, compared to 2020.

In the context of the preparation of the UN Food Systems Summit, Switzerland also conducted important consultation in 2021 with multi-stakeholder dialogues to discuss the future sustainable development of its food systems. The consultations led to the definition of a **National Pathway for Food Systems Transformation**, closely integrated with the SDS. The Food Systems Summit Dialogues helped identify themes such as the development of a coherent cross-sectoral food systems strategy, the promotion of food systems transformation through awareness raising and education, the reflection of the true cost of food in prices and fairer distribution of added value along the chain of actors, and the promotion of

research, innovation, digitalisation and new technologies. These extra elements could potentially be addressed with one of the next revisions of the SDS action plan by the Federal Council.

To accompany food systems transformations, in the context of the International Year of Fruits and Vegetables, a public information campaign was launched in May 2021 by the Federal office of food safety and veterinary affairs, the Federal office of agriculture and several sectoral unions to promote the health benefits of fruit and vegetable consumption. This campaign complemented the "5 per day" campaign in place since 2007. The Swiss Center for agricultural research, Agroscope, in partnership with the private sector also set up a national network to support future joint research activities on fruits and berries aimed at addressing medium- and long-term challenges to the sector.

In January 2022, a more general economic project from the Parliament entered into force aiming at introducing more equitable prices in the Swiss economy by modifying the federal laws on cartels and on unfair competition. This project is a response to a popular initiative for equitable price, which was withdrawn following the Parliament project. Under this policy change, the notion of relative market power will be introduced as well as a clause related to the freedom to buy a good from abroad.

Domestic policy responses to the COVID-19 pandemic

Many of the measures deployed in 2020 to address sectoral and logistical issues at the time of the COVID-19 pandemic outbreak were phased out or already removed in 2021 (sectoral exceptional aides, anticipatory payment of direct support, flexibility in food product labelling, truck traffic authorisation on weed-end). The pandemic response management has been partly transferred to the cantons, but some general support measures were maintained at federal level. Targeted trade measures were also adjusted in 2021 to address specific food supply bottlenecks (see the trade policy section below).

To help economic sectors to adapt to the continued evolution of the sanitary situation, in June 2021 the Federal Council decided to extend the maximum duration of the indemnity for reduced working time under a simplified procedure until February 2022. This extension was then prolonged until end of 2022 in response to new waves of contamination. Derogation permits for movement of seasonal workers and for the management of land close to Swiss borders were extended in 2021, but now managed at the cantonal level. Exceptions were also given for quarantine rules for professional workers from neighbouring regions. The information portal on the management of the pandemic for the agricultural sector was kept in place and continuously updated all over 2021 to reflect the evolution of the regulations in place.

Trade policy developments in 2021-22

In November 2021, the Federal Council adopted its new **Foreign Economic Policy Strategy**, revising its approach to global economic integration in the medium to long term, in light of the past two decades of economic, environmental, socio-political and geopolitical developments. The strategy has nine main areas of action, stressing the importance of transparency, multilateralism, open markets, independence, resilience, sustainability, digital data protection, and policy coherence. The strategy mainly adds clearer objectives more visible to all stakeholders to existing policies.

A new trade agreement between **EFTA and Indonesia,** the Comprehensive Economic Partnership Agreement (CEPA), entered into force on 1 November 2021. This agreement, approved in March 2021, has a specific ordonnance granting reduced duties to palm oil only in the case of sustainable production, and within limited quotas. Switzerland also signed in February 2021 a joint economic co-operation programme of USD 65 million to support economic transformation in Indonesia towards more economic competitiveness, resilience and equity. The CEPA is the first multilateral agreement signed between some European countries and Indonesia.

On 1 October 2021, a **revised EFTA-Turkey agreement** also entered into force, replacing the previous version of 1992. The agreement modernises market access in a number of sectors, improves legal

safeguards for exporters and better addresses issues related to rules of origin, trade facilitation, non-tariff measures, intellectual property rights, competition, public procurement, as well as trade and sustainable development. With this revision, Turkey grants to EFTA partners the same duties as for the European Union and gives Switzerland additional rights in the context of an additional bilateral agreement, with improved access for dairy products, including cheese, meat preparation, fruit juice, coffee, tobacco, chocolate, biscuits Muesli, and some infant food preparation. Turkey obtains in exchange improved access for some of its own agricultural products (cucumber, olive oil, wheat bulgur, nuts, capers, artichoke preserve, or fruit juices).

On 1 August 2021, a series of revised agricultural agreements also entered into force between **EFTA States and Israel**, as well as the revised protocol on transformed agricultural products for the free trade agreement between EFTA and Israel. These revisions allow Switzerland to enjoy an improved market access for its agricultural products in Israel (live animals, meat, cheese and dairy products, fruit juice, tobacco, pasta, vegetable preparations, fruits and nuts), aligned with other preferential agreements recently signed by Israel. In exchange, Switzerland will apply to Israeli products the same reduced tariffs as for some other partners (cut flowers, vegetables, fruits, coffee, tea, jams, tomato preparation and cacao products).

On 1 August 2021, Switzerland ended its preferential tariffs on transformed agricultural products granted to **Egypt** within the context of the EFTA-Egypt free trade agreement of 2007. These specific concessions, governed by a specific bilateral protocol, were set to expire and needed renewal, but the negotiations did not take place. The least favoured nation tariff therefore now applies to Egyptian exports to Switzerland, in particular for coffee, chocolate and confectionery, even though the trade flows involved are relatively small.

Following the departure of the **United Kingdom** from the European Union, organic farming labels were no longer mutually recognised between Switzerland and the United Kingdom. An agreement of equivalence recognising the various country schemes was signed in January 2021 and should remain in force until end of 2022, date after which a longer term solution should be found.

On 1 March 2021, adjusted reference prices were adopted for some raw agricultural products traded between **Switzerland and the European Union** (Protocol n. 2), following a February decision by the Joint Committee of the EU-Switzerland Free Trade Agreement. Revisions apply to skimmed milk powder (reduced duties), whole milk powder, butter and cereals (increased duties). Some duties based on reference prices were also adjusted by the Federal Council for transformed products imported from non-EU countries.

On 1 January 2021, the tariff rate quota for beef was increased by 1 200 tonnes to resolve a conflict on the seasoned meat imports. In 2015, following an import surge, Switzerland decided to reclassify some seasoned meat in its trade nomenclature and apply a higher tariff to these products. This led partner countries to challenge this decision at the WTO. After having recognised the non-compatibility of the measure with trade rules, and to avoid retaliatory measures, the Federal Council negotiated to equalise the tariff for fresh and seasoned meat and offered to expand its beef TRQ by 1 200 tonnes, including 600 tonnes for seasoned beef.

Negotiations continue to establish free trade agreements between EFTA and India, Malaysia, Viet Nam and Moldova. In the case of Moldova, a list of geographical indications to be mutually recognised was established and Switzerland published a list of 15 indications in Moldova to be potentially protected. Discussions are also ongoing for revisions of other existing trade agreements between EFTA and other regions, such as Chile and the Southern African Custom Union (SACU).

Trade policy responses to the COVID-19 pandemic

Some trade measures were adjusted in 2021 reflecting supply difficulties for some specific products in the context of the COVID-19 pandemic. The tariff rate quota for butter was increased by 1 500 tonnes in February 2021, and by an additional 1 000 tonnes, in June 2021, to accommodate the domestic demand of about 40 000 tonnes annually. The tariff rate quota was also increased in April 2021 by 5 000 tonnes for potatoes, in reaction to delayed harvest due to bad weather conditions, and increased consumption at home. Eggs supply also faced difficulties to respond to the increased consumption of households due to the pandemic, and the corresponding tariff rate quota was increased by 3 500 tonnes in October 2021 (+20%) until the end of the year.

Contextual information

Switzerland is a small economy with high GDP per capita that has experienced low and periodically negative inflation and unemployment rates below 5% over the past two decades. GDP growth has been stable at around 2% prior to the COVID-19 pandemic. Swiss GDP shrank by just 2.5% in 2020 – a smaller contraction than in most other economies – and it recovered to pre-crisis levels by mid-2021.

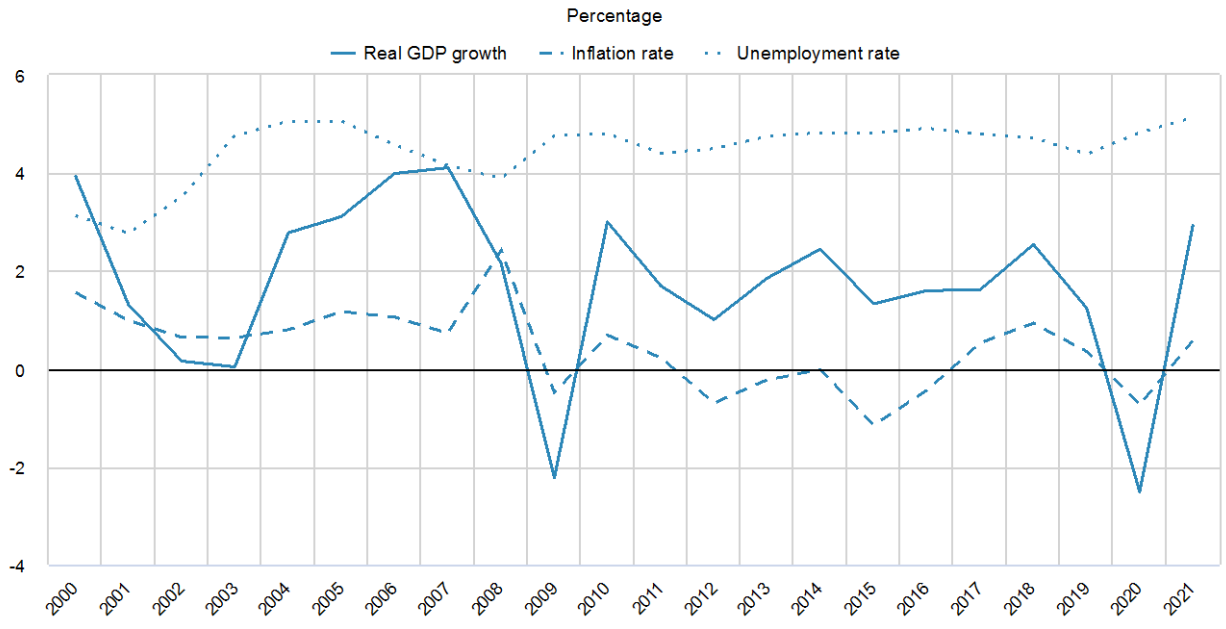
The relative importance of agriculture in the Swiss economy is low accounting for just 0.7% of GDP and around 2% of employment. The farm structure is dominated by relatively small family farms. Hills and mountain farming areas (including alpine summer pastures) are used for extensive milk and meat production, while more concentrated pork and poultry production is located in valleys. Agricultural land covers 37% of the country area and is composed mostly of grassland, with arable land representing only 10% of total area. Crop production has shifted away from traditional arable crops (grains, oilseeds) towards an increasing production of fruits and vegetables over time.

Table 25.3. Switzerland: Contextual indicators

	Switzerland		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	264	620	0.7%	0.6%
Population (million)	7	9	0.2%	0.2%
Land area (thousand km²)	40	40	0.05%	0.05%
Agricultural area (AA) (thousand ha)	1 566	1 507	0.1%	0.1%
			All countries[1]	
Population density (inhabitants/km²)	180	216	53	63
GDP per capita (USD in PPPs)	36 442	71 705	9 281	20 929
Trade as % of GDP	29	40	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	1.1	0.7	2.9	4.9
Agriculture share in employment (%)	4.8	2.9	-	-
Agro-food exports (% of total exports)	2.8	3.1	6.2	8.5
Agro-food imports (% of total imports)	5.9	4.8	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	46	42	-	-
Livestock in total agricultural production (%)	54	58	-	-
Share of arable land in AA (%)	26	26	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 25.5. Switzerland: Main economic indicators, 2000 to 2021



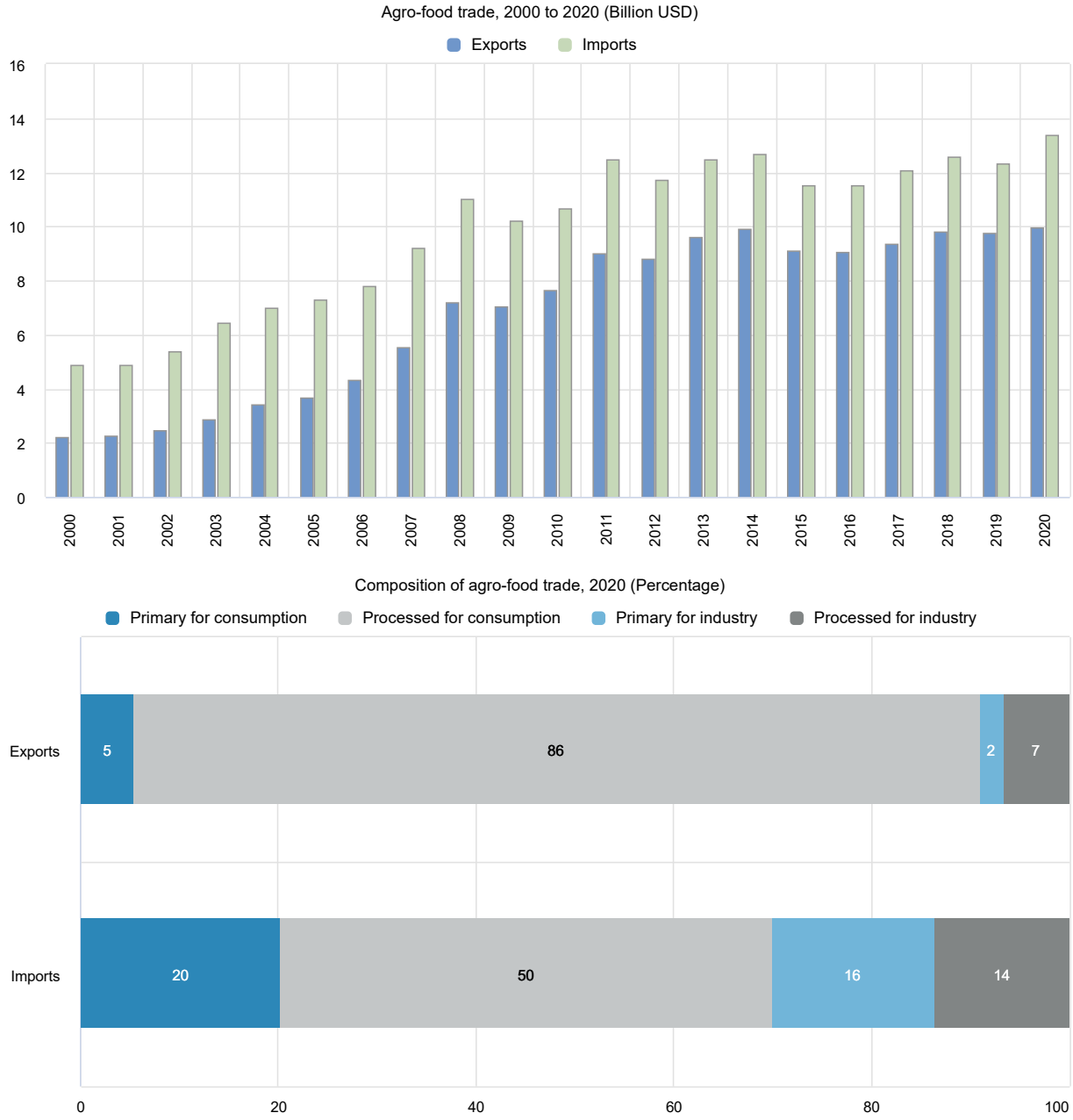
Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Switzerland has consistently been a net agro-food importer; its current share of agro-food imports in total imports is 4.8%, while the share of agro-food exports in total exports is 3.1%. Swiss agro-food exports

consist mostly of processed products for final consumption (86% of total agro-food exports). This category also represents half of the agro-food imports (Figure 25.6).

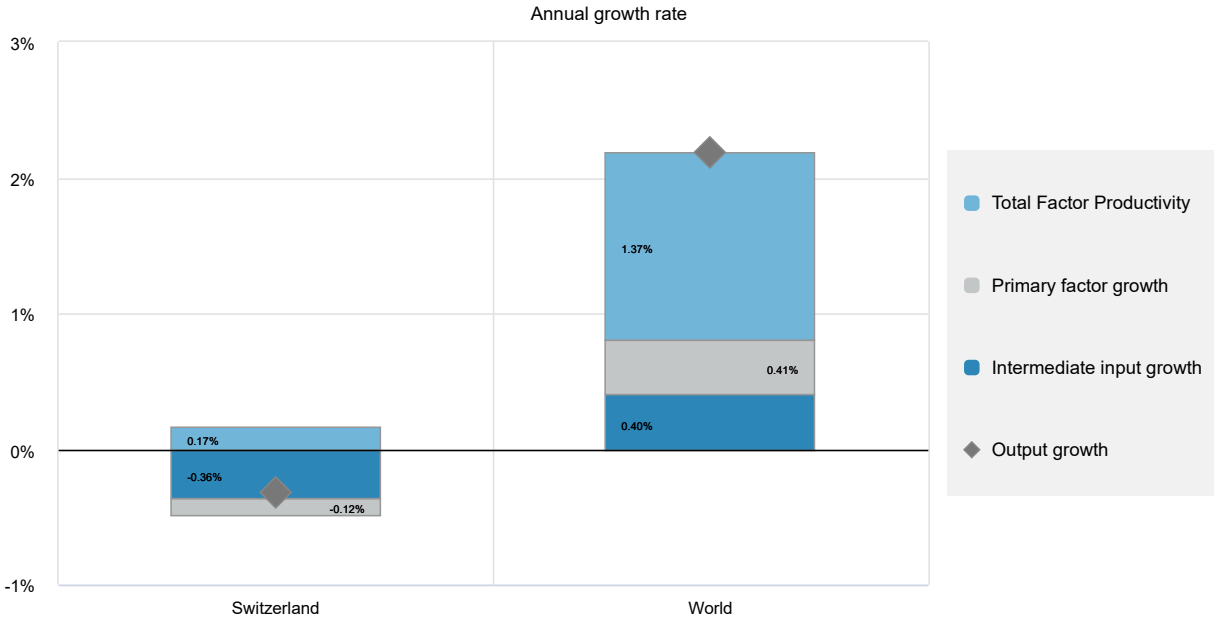
Total factor productivity (TFP) growth in agriculture has slowed significantly to close to zero between 2010 and 2019. However, both the use of intermediary inputs (-0.36%) and primary factor (-0.12%) decreased. As a result, overall output has declined over that period.

Figure 25.6. Switzerland: Agro-food trade



Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Figure 25.7. Switzerland: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Swiss agriculture is largely rain-fed. Swiss farmers irrigate only 2.2% of their agricultural land and the share of agriculture in the country's water abstraction (8%) is less than one-fifth of the OECD average. In addition, the water stress indicator is well below the OECD average. Nutrient surpluses have declined moderately, but the surplus of nitrogen (59 kg/ha for N) is still twice the OECD average, which negatively impacts water quality and GHG emissions. Agriculture's share of energy use went down, and is less than one-third of the OECD average.

Swiss agriculture emissions amounted to 5.9 $MtCO_2eq$ in 2019 (12.7% of national emissions), not counting emissions from energy consumption in agriculture, forestry and fisheries (0.6 $MtCO_2$, i.e. 1.3%). This places the country above the OECD average. Methane is the largest source of emissions in the agricultural sector (66%), in particular enteric fermentation emissions from cattle (55%) and manure management (11%). Nitrous oxide emissions also come from manure management (8%) and to a larger extent from agricultural soil (26%) due mostly to manure deposited by animals on pasture or applied as organic fertilisers, and to crop residues. Synthetic fertilisers are responsible for only 4% of total agricultural non-CO_2 emissions. Agricultural emissions have been decreasing since 1990 (-12%), but unevenly across sources. Agricultural soil emissions decreased the most due to better fertiliser management (-17%), followed by manure management (-14%). Enteric fermentation emissions have decreased relatively less (-9%) and have been rather stable for the last 20 years. The agriculture sector is also a source of emissions through the land use, land-use change, and forestry (LULUCF) sector, with the changes in soil carbon in agricultural land. While the LULUCF sector in Switzerland is a net sink, thanks to forest management (-2.3 $MtCO_2$ per year), cropland and grassland emit an average 0.7 $MtCO_2$ (1.5% of the national emissions).

Table 25.4. Switzerland: Productivity and environmental indicators

	Switzerland		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.7%	0.2%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	63.0	59.0	32.1	30.0
Phosphorus balance, kg/ha	3.0	4.0	3.4	2.9
Agriculture share of total energy use (%)	0.6	0.6	1.7	2.0
Agriculture share of GHG emissions (%)	11.4	12.7	8.6	9.7
Share of irrigated land in AA (%)	2.8	2.2	-	-
Share of agriculture in water abstractions (%)	..	8.0	46.3	43.7
Water stress indicator	4.9	3.8	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

References

OECD (2017), *Reforming agricultural subsidies to support biodiversity in Switzerland: Country Study*, OECD Publishing, Paris, https://doi.org/10.1787/23097841. [2]

OECD (2015), *OECD Review of Agricultural Policies: Switzerland 2015*, OECD Review of Agricultural Policies, OECD Publishing, Paris, https://doi.org/10.1787/9789264168039-en. [1]

26 Turkey

Support to agriculture

Turkey's transfers to agricultural producers as a share of gross farm receipts are slightly above the OECD average. Support to producers was about 20% of gross farm receipts in 2019-21, a decline from 24% in 2000-02. Most support (64% in 2019-21) takes the form of market price support (MPS) enabled by tariffs, combined with reductions of exporters' debts and equity injections to state enterprises. This is well above the OECD average. Producer prices were about 15% above border prices in 2019-21, primarily because of support for potatoes, wheat, sunflower seed and beef. Prices of other commodities align with border prices. The remaining support mainly comprises premium payments to producers of specific commodities, area-based payments provided in the form of crop insurance, and payments to defray the cost of diesel and fertiliser. Concessional loans featured prominently in the policy response to COVID-19 pandemic in 2020 and raised the PSE above trend in that year.

General support to the sector (GSSE) was 2.3% of the value of agricultural production in 2019-21, down from 15.4% in 2000-02. However, 2000-02 had unusually high duty loss payments due to a surge in inflation, and general support in 1986-88 more closely reflects historical averages. Support to irrigation infrastructure is the largest component of GSSE, about 66% in 2019-21. The next-largest element is duty loss payments and equity injections, about 27% in 2019-21. Total support to the sector was 1.6% of GDP in 2019-21, down from 3.8% in 2000-02, reflecting its shrinking role in the economy over that period.

Recent policy changes

Turkey adopted the Green Deal Action Plan in 2021, with targets and actions to increase the sustainability of agriculture. The main actions foreseen are reductions in the use of pesticides, anti-microbials and chemical fertilisers, developing organic production, increasing renewable energy use in agriculture, and improving the management of waste and residues.

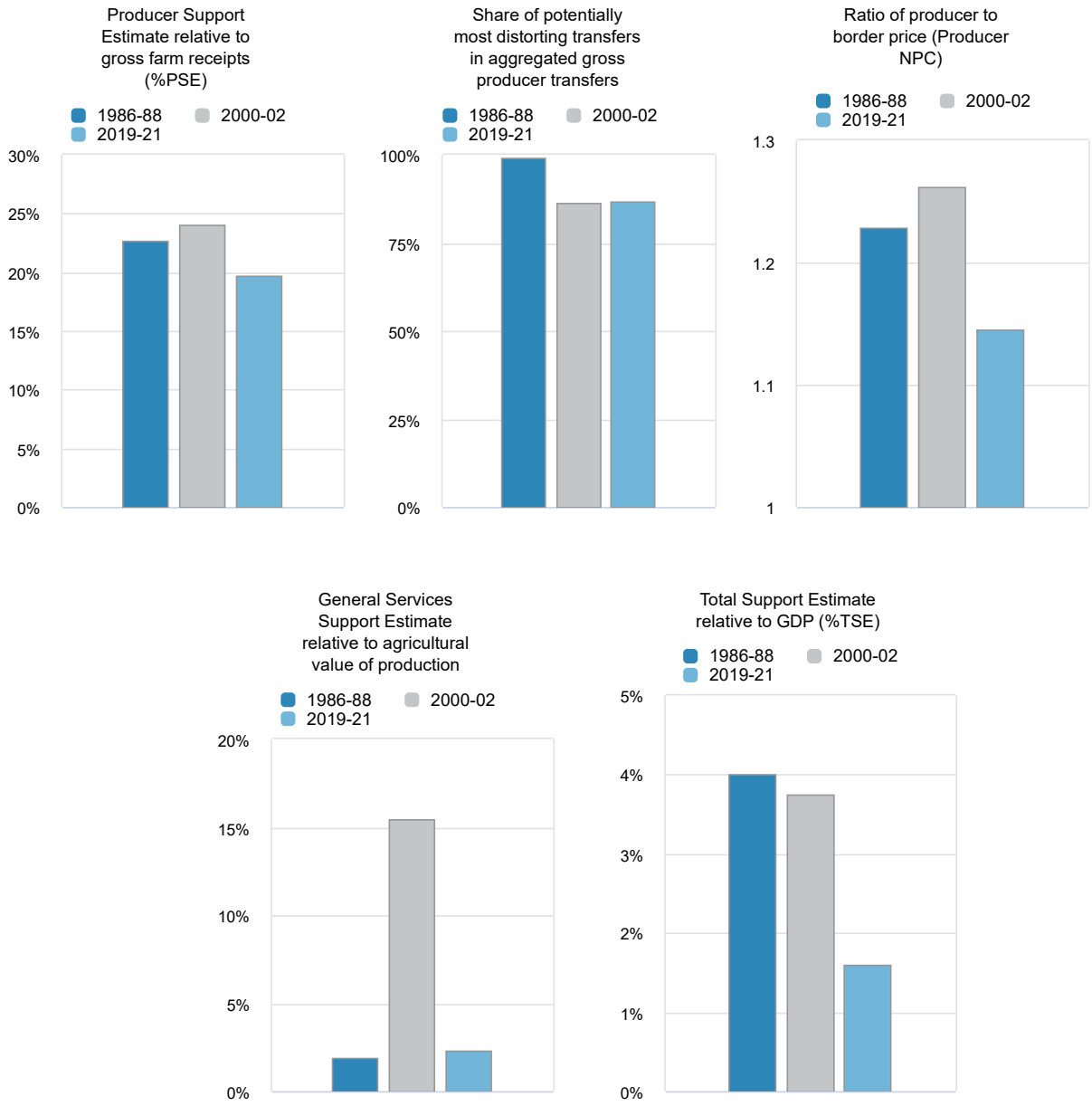
The first meeting of the new Water Council was held in March 2021 to determine Turkey's short, medium and long-term water strategies. A water management policy will be developed with relevant stakeholders, including farmers, academics, non-governmental organisations and the public sector. A pilot study was put in place during the 2021 irrigation season to establish a water pricing system where users pay higher fees if consumption increases. This pilot will expand to include all irrigation facilities with proper water metering infrastructure.

Turkey prepared its National Food Systems Pathway in 2021 within the scope of the UN Food Systems Summit. Turkey's national pathway includes 10 priorities and 117 actions connected with the five Summit action tracks to transform food systems and achieve the Sustainable Development Goals by 2030.

Assessment and recommendations

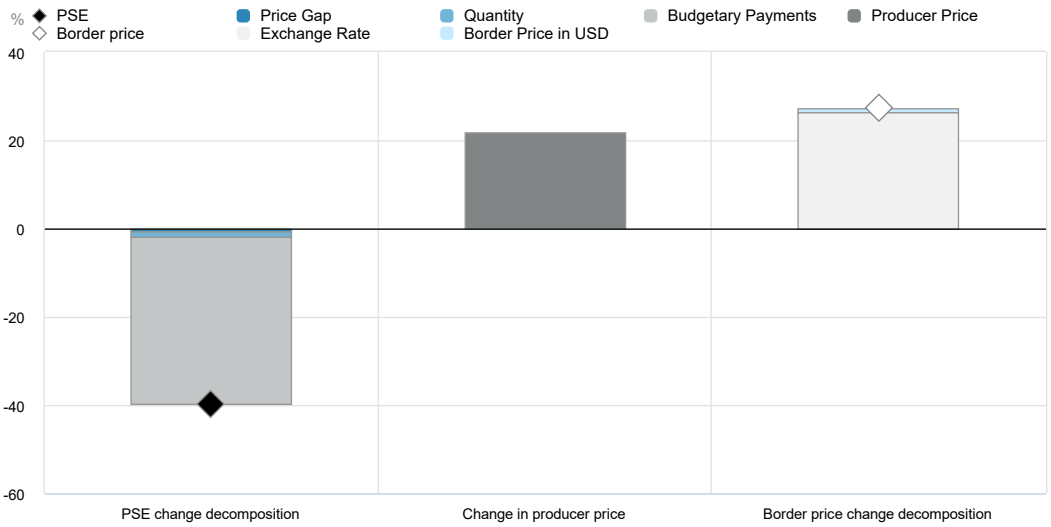
- The Nationally Determined Contribution (NDC) of Turkey allows increasing emissions until 2030; there is no specific emissions reduction target for agriculture. The government set a target of net-zero emissions by 2053, but the path to achieve this is not clear.
- Emission reductions in agriculture rely on increased efficiency in land and inputs use. However, existing policies to defray the costs of fuel and fertiliser can be counterproductive to this. Moreover, government investment in agriculture knowledge and information systems is low relative to other OECD countries.
- Agricultural policy has a strong influence on production decisions, and state enterprises are an important part of the product marketing system for certain commodities. Reducing the role of state enterprises in agricultural markets and replacing self-sufficiency targets and planned agricultural production with a focus on competitiveness and efficiency will promote resilient sector growth, provided that sensible environmental policies to ensure sustainability are also in place.
- Considerable investments were made in developing the irrigation system. Recent moves to investigate the potential for water pricing are a welcome development and lessons learned from the pilot phase should be applied. Sustainable water use will be important for climate resilience in the sector.
- The COVID-19 pandemic resulted in temporary reductions of tariffs for many important agricultural staples. This is an opportunity to improve market openness and ease food price increases for consumers by making these changes permanent.

Figure 26.1. Turkey: Development of support to agriculture



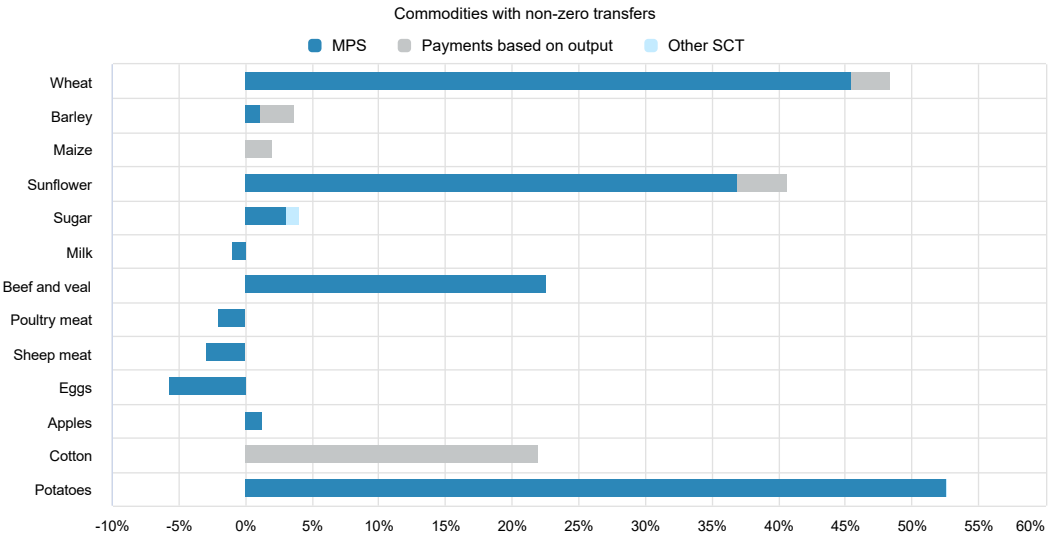
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 26.2. Turkey: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 26.3. Turkey: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 26.1. Turkey: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**18 343**	**22 169**	**51 222**	**53 625**	**52 251**	**47 790**
of which: *share of MPS commodities (%)*	55.00	70.61	64.48	64.66	64.45	64.34
Total value of consumption (at farm gate)	**15 837**	**20 359**	**45 919**	**47 047**	**46 392**	**44 317**
Producer Support Estimate (PSE)	**4 304**	**5 922**	**10 972**	**9 795**	**15 655**	**7 466**
Support based on commodity output	3 419	5 034	7 621	7 997	8 440	6 425
Market Price Support[1]	3 408	4 719	6 981	7 283	7 752	5 907
Positive Market Price Support	3 412	4 726	7 170	7 388	7 976	6 147
Negative Market Price Support	-3	-8	-190	-104	-224	-240
Payments based on output	11	316	640	714	687	518
Payments based on input use	885	426	2 396	736	6 265	187
Based on variable input use	850	302	1 821	339	4 995	129
with input constraints	0	0	0	0	0	0
Based on fixed capital formation	19	116	573	392	1 270	58
with input constraints	0	0	0	0	0	0
Based on on-farm services	16	8	2	5	0	0
with input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	25	956	1 062	951	854
Based on Receipts / Income	0	0	193	195	210	176
Based on Area planted / Animal numbers	0	25	762	867	741	679
with input constraints	0	0	83	145	54	48
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	436	0	0	0	0
With variable payment rates	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	436	0	0	0	0
with commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**22.73**	**23.99**	**19.66**	**17.45**	**26.03**	**15.13**
Producer NPC (coeff.)	**1.23**	**1.26**	**1.15**	**1.15**	**1.16**	**1.13**
Producer NAC (coeff.)	**1.29**	**1.32**	**1.24**	**1.21**	**1.35**	**1.18**
General Services Support Estimate (GSSE)	**333**	**3 507**	**1 163**	**1 089**	**1 018**	**1 380**
Agricultural knowledge and innovation system	67	29	63	77	64	47
Inspection and control	51	67	13	16	13	11
Development and maintenance of infrastructure	22	513	778	750	749	836
Marketing and promotion	95	2 888	309	247	192	486
Cost of public stockholding	0	0	0	0	0	0
Miscellaneous	99	11	0	0	0	0
Percentage GSSE (% of TSE)	**7.39**	**37.81**	**9.94**	**10.01**	**6.11**	**15.60**
Consumer Support Estimate (CSE)	**-3 032**	**-4 513**	**-5 924**	**-6 107**	**-6 182**	**-5 484**
Transfers to producers from consumers	-3 027	-4 547	-5 875	-6 137	-6 433	-5 056
Other transfers from consumers	-49	-64	-277	-45	-2	-782
Transfers to consumers from taxpayers	0	0	0	0	0	0
Excess feed cost	43	97	227	76	253	354
Percentage CSE (%)	**-19.70**	**-20.49**	**-12.85**	**-12.98**	**-13.33**	**-12.38**
Consumer NPC (coeff.)	**1.25**	**1.26**	**1.15**	**1.15**	**1.16**	**1.15**
Consumer NAC (coeff.)	**1.25**	**1.26**	**1.15**	**1.15**	**1.15**	**1.14**
Total Support Estimate (TSE)	**4 637**	**9 429**	**12 135**	**10 885**	**16 673**	**8 846**
Transfers from consumers	3 075	4 611	6 152	6 183	6 435	5 838
Transfers from taxpayers	1 611	4 881	6 259	4 748	10 241	3 790
Budget revenues	-49	-64	-277	-45	-2	-782
Percentage TSE (% of GDP)	**4.00**	**3.76**	**1.59**	**1.43**	**2.32**	**1.15**
Total Budgetary Support Estimate (TBSE)	**1 229**	**4 710**	**5 154**	**3 601**	**8 921**	**2 940**
Percentage TBSE (% of GDP)	**1.07**	**1.95**	**0.68**	**0.47**	**1.24**	**0.38**
GDP deflator (1986-88=100)	**100**	**139 552**	**1 121 257**	**943 640**	**1 083 548**	**1 336 583**
Exchange rate (national currency per USD)	**0.00**	**1.12**	**7.18**	**5.68**	**7.02**	**8.86**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Turkey are: wheat, maize, barley, sunflower, sugar, potatoes, tomatoes, grapes, apples, cotton, tobacco, milk, beef and veal, sheep meat, poultry and eggs.
Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Before 1980, an import substitution policy was in place and agriculture was tightly controlled to meet policy objectives, which included maintaining stable grain prices, increasing yields and production and developing exports. Some agricultural products were taxed while others received subsidies, but the sector was a net payer to the government budget overall (OECD, 2016[1]).

From the 1980s until 2000, the sector was a net beneficiary of support, directed towards import-competing farm products. The main agricultural policy instruments were price support for crop products and input subsidies. Programmes provided low-cost credit, agricultural chemicals, seeds, irrigation and fertiliser. Livestock production was supported mainly by border measures.

State enterprises managed intervention buying, in the form of State Economic Enterprises (SEEs) as exclusive purchasers of grains, pulses, sugar, tobacco and tea; and Agricultural Sales Cooperative Unions (ASCUs) responsible for horticultural crops, cotton, oilseeds, nuts, and olive oil. Support prices were announced after planting, and farmers received payment a year or more after harvest and delivery. These bodies also maintained stocks, executed exports, issued export licenses and distributed input subsidies.

After 2000, the country embarked on a process of structural reform as a condition for receiving macro-economic stabilisation assistance from the IMF and World Bank (Burrell and Kurzweil, 2007[2]; OECD, 2016[1]). These reforms were carried out between 2001 and 2008 through the Agricultural Reform Implementation Project (ARIP). ARIP was intended to improve efficiency in the agro-food sector by removing market distortions, and contribute to fiscal consolidation. Under ARIP, Turkish agricultural policy was oriented towards closer alignment with the EU's Common Agricultural Policy.

Reforms after 2001 reduced the State's role in setting prices, marketing, and trade of agro-food products. SEEs and producer co-operatives were made independent to varying degrees and at different speeds, and became more exposed to market conditions. Structural adjustment in agriculture was promoted through aid to convert land to alternative production, or land consolidation, and with transition support and aid for rural development. This period also saw a shift away from output and input subsidies towards direct income support payments, although high border protection for agro-food products remained in place (OECD, 2011[3]).

Since 2010, production-linked payments were re-established for many products. Current agricultural policies also include import tariffs, fixed purchasing prices, export subsidies, deficiency payments (income support payments), insurance support and input subsidies (mostly through interest concessions). In addition, there is an emphasis on infrastructure, particularly for irrigation, also connected to rural development objectives.

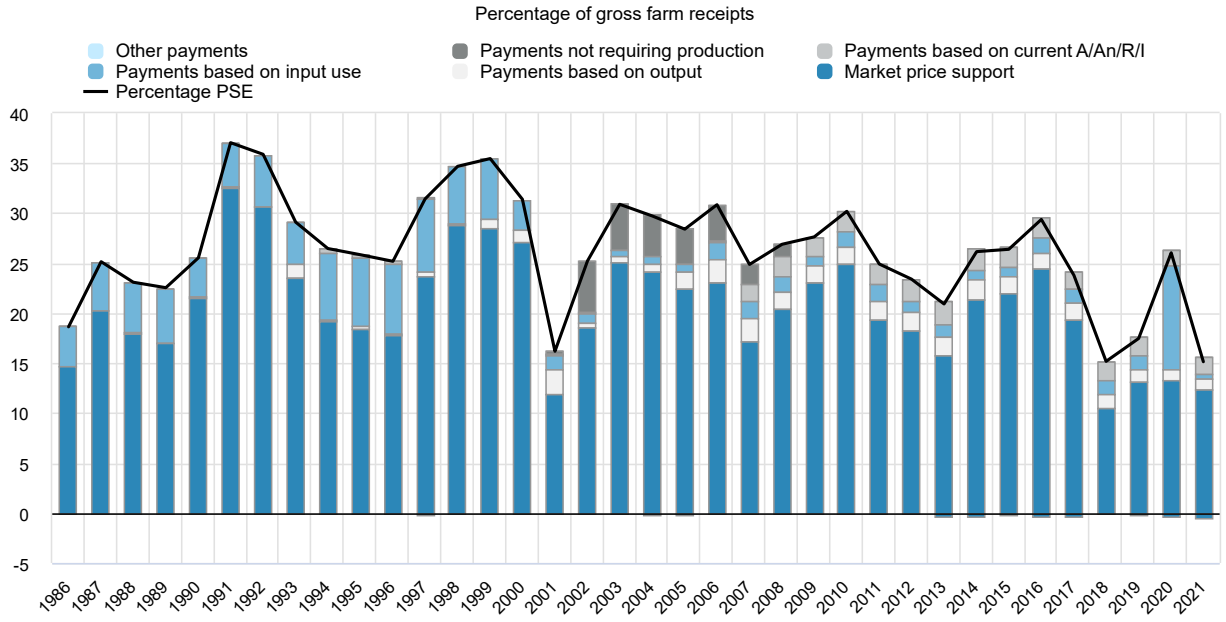
Table 26.2. Turkey: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1980s	Closed economy (import substitution regime)	High tariffs for border protection Agricultural price controls Input subsidies Import controls by the State Economic Enterprises (SEE) which controlled agricultural marketing and production Agricultural Sales Co-operatives Unions (ASCU) and agricultural member cooperatives (ASC) Agricultural Credit Cooperatives State-owned Agricultural Bank
1980-2010	Gradual reform to liberalise trade but with agricultural protection	Agricultural Reform Implementation Project (ARIP) as a precondition of the World Bank and IMF programmes Privatisation of SEEs and restructuring of ASCUs Price-fixing by government discontinued for some products but remains for others Gradual reduction of tariffs for some agricultural inputs and outputs Progressively reduced role for ASCUs and ASC Price controls continued Product and input subsidies phased out Introduction of Direct Income Support Compensatory payments to cover the cost of switching from crops in excess supply (e.g. hazelnuts and tobacco) to alternative activities (net imported products) Introduction of agri-environmental policies and cadastral works FTAs signed
2010-present	Open market economy but with agricultural protection	Agricultural tariffs continue to be used Export subsidies implemented Deficiency payments differentiated according to 30 agricultural basins throughout the country Infrastructure investments increased

The PSE was mostly in the range of 25-30% of agricultural gross farm receipts over the past two decades. After 2018, exchange rate movements have reduced the importance of market price support and support has been lower on average (Figure 26.4).

Overall, nominal support increased since the late 1980s. Budgetary payments grew, starting with the move towards decoupled payments in the early 2000s, and remained significant through successive reforms that changed their basis. Budgetary support jumped in 2020 as a consequence of exceptional spending related to COVID-19, mainly for concessional loans and interest concessions. Macroeconomic conditions such as the exchange rate and inflation are likely to be important drivers of support levels in the near term.

Figure 26.4. Turkey: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The majority of support comes through market price support, consisting mainly of tariffs on imported products, though recent exchange rate movements have reduced the relative importance of this form of support. Budgetary support comes through price-stabilising (deficiency) payments and area payments based on production characteristics. Purchases of inputs and marketing of major commodities is handled through State enterprises (SEEs) or collective marketing boards (ACSUs), which have price-setting power. Irrigation infrastructure is the main target of general support to the sector.

Export subsidies apply to 14 commodity groups, out of the 19 groups eligible under Turkey's WTO commitments. These include processed fruit and vegetables, poultry meat and eggs. Export subsidies are granted in the form of reductions of the exporters' debts to public corporations (for example, for taxes, and telecommunications or energy costs). Production quotas apply at the farm level for sugar beet. Under the Nairobi agreement, export subsidies are to be phased out by the end of 2022.

The Basin-Based Support Model (*Havza Bazlı Destekleme Modeli*) targets self-sufficiency in strategic agricultural products and planned agricultural production. Agricultural areas are divided into 941 basins, each identified with a set of strategic products that will receive support in that basin. Deficiency payments are set to raise the price of specific commodities to encourage a certain pattern of production according to the government's evaluation of ecological sustainability and economic suitability. R&D is targeted to increase the yield and quality of local varieties. Basin- and product-based fertilisation and chemical pesticide guides and plant-based water consumption guides are in place.

The Support Model of Domestic Production in Livestock (*Hayvancılıkta Yerli Üretimi Destekleme Modeli*) aims to meet increasing red meat demand, improve breeding, determine breeding regions, use pastures rationally, fight animal diseases effectively, reduce calf losses, and increase exports by ensuring sustainable milk production. The model sets pasture livestock breeding zones. Within these zones, grants for investments and for purchase of pasture livestock are available to producers. Support is also provided for rangeland improvement and some veterinary services, and breeding centres are to be established by private breeding associations to supply heifers to ranchers.

There are several forms of area-based payments. Hazelnut producers receive payments based on area of production. Farmers can also receive area payments for producing fodder crops or certified saplings, organic farming, using good agricultural practices, using certified seeds, and for the rehabilitation of olive groves. Each farmer registered under the National Farmer Registration System (NFRS) receives a so-called “diesel payment” and a “fertiliser payment” based on current area of production.

State-supported agricultural insurance (TARSİM) comes through a public-private partnership where private insurance companies deliver uniform policies to farmers. The state pays between 50% and 67% of the total insurance premium on behalf of farmers.

The Environmentally Based Agricultural Land Protection Programme (ÇATAK) helps to increase soil and water quality and sustainability of renewable natural resources. It promotes minimum tillage practices and efficient irrigation practices in areas of intensive agricultural activities. The programme also targets raising awareness of producers on agri-environmental issues and increasing agricultural income by reducing input costs. ÇATAK specifically targets the negative impacts of agricultural practices on the environment. The programme is expected to mitigate CH_4 and CO_2 emissions through the actions mentioned above. Since 2006, ÇATAK has provided economic incentives to farmers in 58 provinces (payments of TRY 45-135/thousand m^2 according to the technique used).

Climate change mitigation policies in agriculture

Agricultural emissions, mostly due to enteric fermentation, accounted for 13.4% (68.0 $MtCO_2eq$) of Turkey’s total greenhouse gas emissions in 2019, up from 12.5% (42.4 $MtCO_2eq$) in 2005. To this amount should be added most emissions from fossil fuels consumed by agriculture, forestry and fishing (2.1%, i.e. 10.9 $MtCO_2$) and a minor amount of annual soil carbon losses from agricultural land (0.2%, i.e. 1.1 $MtCO_2$). Emissions from agriculture increased since 2008 because of the growing number of livestock, which generate a large amount of methane. Agricultural activities represent the largest national source of methane and nitrous oxide emissions.

The Turkish Grand National Assembly ratified the Paris Agreement on 6 October 2021, which entered into force on 10 November 2021. The government set a net-zero emission target by 2053. Turkey did not yet submit its mid-century, long-term, low-GHG-emission development strategy to the UNFCCC. There is no specific target for agriculture in its Nationally Determined Contribution, and emissions are projected to increase at least until 2030 (but less than the business-as-usual scenario). Mitigation actions mentioned are fuel savings from consolidation of agricultural land, rehabilitating grazing lands, controlling fertiliser use, implementing modern farming practices and encouraging minimum tillage farming techniques.

Turkey focuses on improved efficiency of input use to reduce agricultural GHG emissions. Specific programmes and activities currently in place contributing to reducing GHG emissions are:

- Land consolidation and on-farm development services
- Support programme for modern irrigation and processing methods to save water
- Organic agriculture/good agricultural practices
- Completed Environmental Agricultural Land Protection Program (ÇATAK)
- Implementation of the Nitrate Directive

- Soil conservation and Land Use Law
- Supporting certified saplings and fruit plants
- Rangeland improvement works.

Domestic policy developments in 2021-22

Global markets are increasingly sensitive to environmental performance. In particular, the EU Green Deal will affect Turkey, both as a candidate country and as a Customs Union partner. In light of this, the government considers that the green transformation of the Turkish economy and industry is essential for sustainable growth, export competitiveness and to preserve and deepen Turkey's integration with the EU market.

In response to these international market changes, Turkey adopted its own Green Deal Action Plan, published in the official gazette in July 2021. This action plan includes targets and actions on sustainable agriculture. The main actions foreseen are reduced use of pesticides, anti-microbials and chemical fertilisers, development of organic production, increasing renewable energy use in agriculture and better managing waste and residues.

In 2021, a Water Council was established to help determine Turkey's short, medium and long-term water strategies. It was agreed that a water management policy will be developed with relevant stakeholders, including farmers, academicians, non-governmental organisations and the public sector. The first meeting to discuss the water management policy was held on 29 March 2021. The Water Council has eleven working groups (Water Efficiency, Management of Water at Basin Scale, Water Law and Policy, Water Safety and Wastewater Services, Protection and Monitoring of Water Resources in Quality and Quantity, Impact of Climate Change on Water Resources and Adaptation, Decision Support Systems in Water Resources Management, Development of Water Resources, Agricultural Irrigation, Storage Facilities, Water, Forestry and Meteorology).

Within the scope of UN Food Systems Summit, Turkey prepared the National Pathway of Turkey in 2021. Turkey's national pathway includes 10 main priority areas and 117 actions in connection with the five Summit action tracks, in order to transform food systems and achieve the Sustainable Development Goals by 2030.

The main priority areas are:

- Developing fair access to safe and nutritious food, particularly for vulnerable groups
- Improving public health, food safety and strengthening inspections and controls with innovative methods
- Encouraging the sustainability supply and value chain in the agri-food sector and reducing food loss and waste
- Raising consumer awareness and promoting sustainable consumption
- Improving climate change compatible production models
- Using water resources more efficiently
- Managing natural resources more sustainably
- Developing more inclusive policy for disadvantaged groups in the agri-food sector
- Increasing rural vitality
- Building the resilience of food systems against climate change, natural disasters and unexpected crisis

Coverage under the state-supported agricultural insurance continues to expand. Revenue Protection Insurance is now available for wheat producers in the city of Konya as a pilot project as of the 2021-22

crop year. Revenue Protection Insurance covers 70% of insured farmer revenue against yield losses and price variations. In 2021, 2.25 million insurance policies were issued and TRY 2.1 billion (USD 237 million) of state insurance premium support was provided.

In 2020, Turkey published its national strategy document on Prevention, Reduction and Monitoring of Food Loss and Waste and its action plan in co-operation with the FAO. The action plan aims to intensify efforts at national, regional and international levels to prevent food loss and waste. The campaign is still ongoing but already shows positive results. Reduced food waste has saved households an estimated USD 80 million. Awareness of the meaning of “use by” and “best before” dates has improved. Households are reporting better portion sizing at meals and more recycling of food waste.

The “Turkey Agricultural Drought Strategy and Action Plan, 2018-22” is in its final year. Activities continue under five headings: i) drought risk estimation and crisis management; ii) ensuring a sustainable water supply; iii) effective management of agricultural water demand; iv) increasing support to R&D activities, training and extension services; and v) institutional capacity building. As part of the strategy, Drought Management Plans are to be completed for 25 basins by the end of 2023. Between 2014 and 2021, 15 such plans were completed. Responsible institutions must report on the implementation of the Management Plans every six months.

Within the framework of the “Rural Development Investments Support Program”, 50% grant support is available for the installation of irrigation systems (drip or sprinkler). Approximately 330 000 producers were supported by grants and credit support, and pressurized irrigation systems were installed on a total area of 1.12 million hectares by the end of 2021. Since 2003, the use of closed system irrigation projects has been accelerated to reduce loss and leakage. In 2003, only 6% of irrigated area used piped irrigation networks, but by 2020 this had increased to 29%.

In the irrigation season of 2021, a pilot study was put in place to charge higher water usage service fees when more water is used. This pilot will be expanded to include all irrigation facilities with proper infrastructure. Centrally monitored measurement facilities were installed in storage facilities and irrigation networks with an area of 500 hectares and above. These measure water flows during storage, transmission, distribution and discharge. These facilities will eventually support volume-based water pricing.

Specialized Organized Industrial Zones Based on Agriculture, which are designed to advance women's employment, sustainability and zero waste objectives, will continue to be supported in order to increase the competitiveness of the agricultural sector with quality and reliable production and branding, and to ensure agriculture-industry integration.

Trade policy developments in 2021-22

The average rate of customs duties applied in 2021 for basic agricultural products outside the Customs Union Common External Tariff was 58%.

In 2021, a Free Trade Agreement (FTA) with the United Kingdom, revised FTAs with EFTA and Bosnia-Herzegovina as well as a Preferential Trade Agreement (PTA) with Azerbaijan came into force. The ratification process of the Montenegro FTA is continuing. FTA negotiations are actively ongoing with five countries: Ukraine, Japan, Thailand, Somalia and Indonesia.

Trade policy responses to the COVID-19 pandemic

To ensure domestic supplies, tariffs were reduced and in-quota import amounts increased for several commodities. As of 8 September 2021, customs duty rates on certain agricultural commodities were removed until 1 January 2022. These duty rates had been 45% for wheat, 35% for barley, 25% for maize, 130% for oat, rye and sorghum and 19.3% for chickpeas and lentil. The 27% tax rate for sunflower seed

for oil and the 36% tax rate for unrefined sunflower oil were also removed until 1 January 2022. The export of pasta, bulgur and wheat semolina is subjected to registration as of June 2021 and export of chickpeas as of October 2021.

Contextual information

Turkey has the 11th largest economy in the world as measured by GDP in PPP. Per capita GDP has tripled since 2000 and is above average for the countries included in this report. Turkey has a large agriculture sector that employed almost 18% of the country's working population and accounted for 6.7% of GDP in 2020. Turkey is a net exporter of agro-food products, which accounted for 11.8% of all exports recently (Table 26.3).

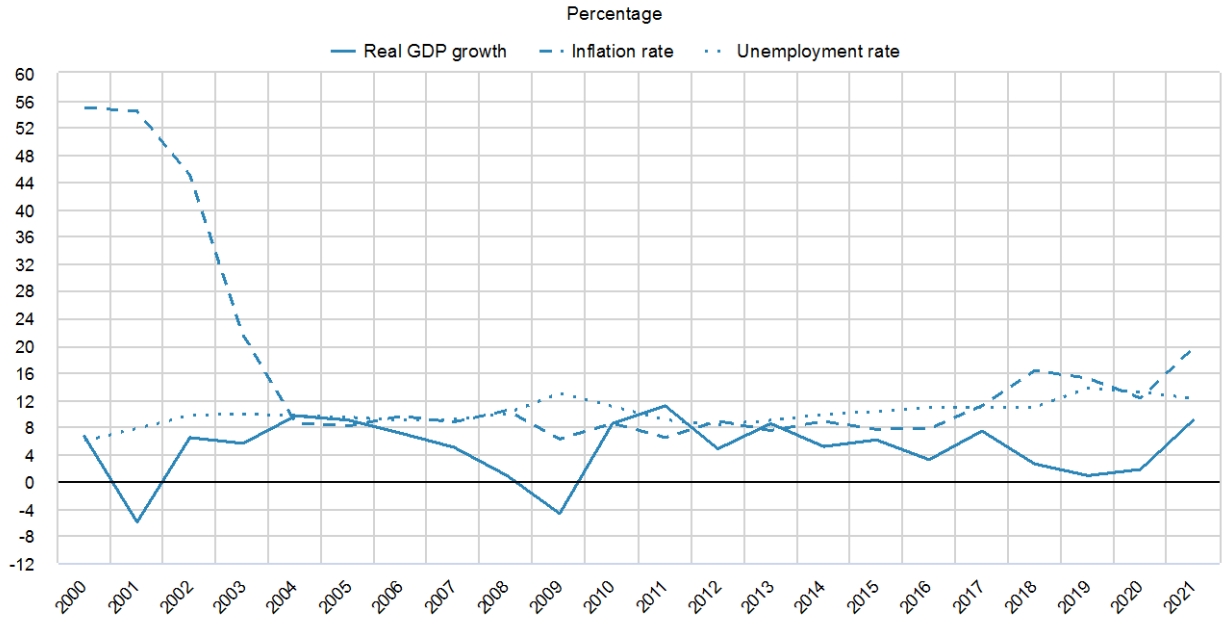
Table 26.3. Turkey: Contextual indicators

	Turkey		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	609	2 371	1.5%	2.2%
Population (million)	64	83	1.5%	1.6%
Land area (thousand km²)	770	770	0.9%	0.9%
Agricultural area (AA) (thousand ha)	40 479	37 716	1.3%	1.3%
			All countries[1]	
Population density (inhabitants/km²)	82	110	53	63
GDP per capita (USD in PPPs)	9 479	28 435	9 281	20 929
Trade as % of GDP	15	27	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	10.0	6.7	2.9	4.9
Agriculture share in employment (%)	36.0	17.6	-	-
Agro-food exports (% of total exports)	13.2	11.8	6.2	8.5
Agro-food imports (% of total imports)	5.9	7.7	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	56	57	-	-
Livestock in total agricultural production (%)	44	43	-	-
Share of arable land in AA (%)	59	52	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

GDP growth was estimated at 9% in 2021, but is expected to slow as the effect of inflation on private consumption more than offsets a sustained boost from net exports. Macro policy uncertainty after multiple central bank interest rate cuts has led to a sharp decline in the exchange rate in the second half of 2021. Inflation is high and has long been well above the official target of 5%. Accelerating inflation, now at 19.6%, has raised concerns about near-term financial stability (Figure 26.5). The pandemic exacerbated structural challenges related to high unemployment, low labour force participation and widespread informality in the labour market (OECD, 2021[4]).

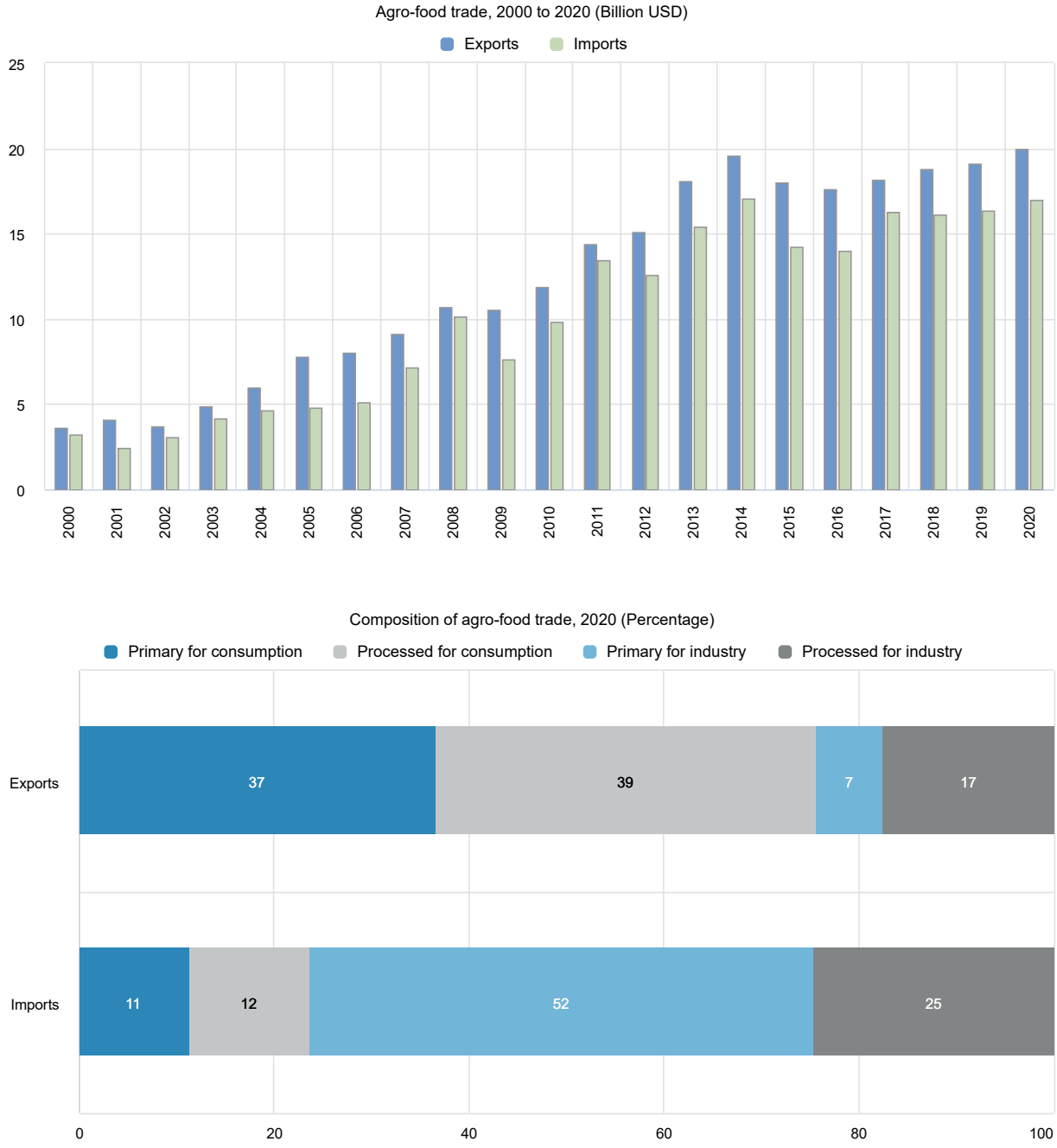
Figure 26.5. Turkey: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Turkey is a significant agricultural exporter of nuts, dried fruits, and some fresh vegetables; main export destinations include the European Union, Iraq, the Russian Federation and the United States. Turkey is a major producer of wheat, sugar beets, milk, poultry, cotton, tomatoes and other fruits and vegetables, and is the top producer in the world for apricots and hazelnuts as well as the largest global exporter of quinces and raisins. Agricultural trade has been steadily increasing and Turkey is a net exporter. Most imports are products destined for further processing, while most exports are products for consumption (Figure 26.6).

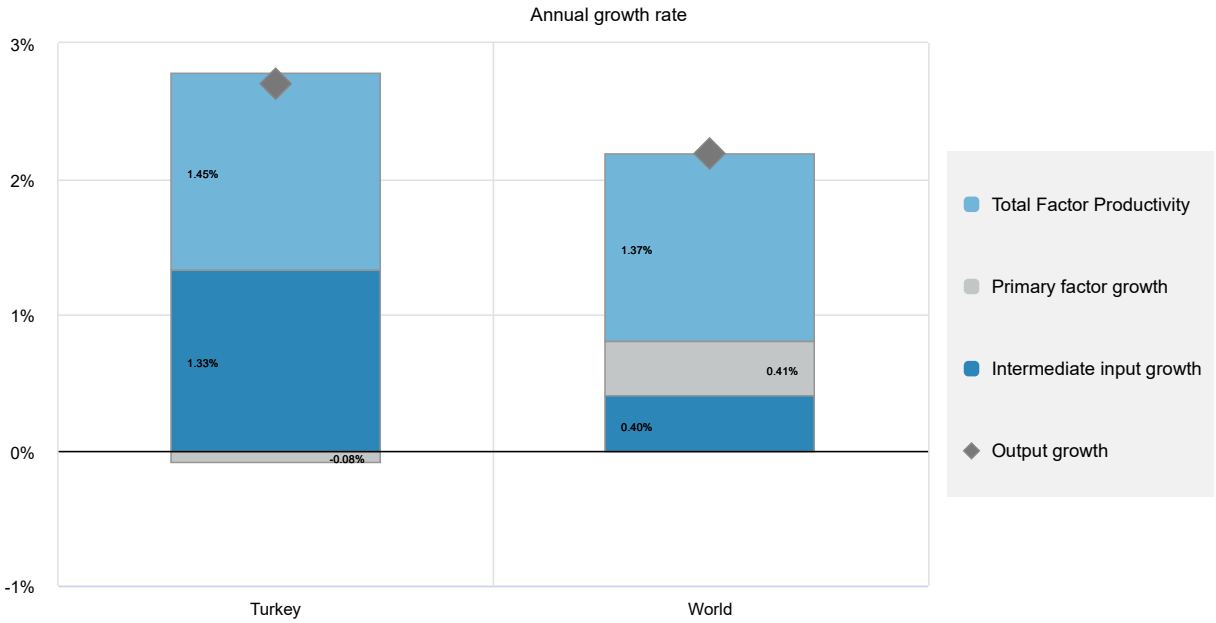
Figure 26.6. Turkey: Agro-food trade



Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Agricultural growth has been predominantly based on total factor productivity (TFP) growth and increased use of inputs (Figure 26.7). Improved productivity may be connected to increased irrigated area, opening more land to intensive production.

Figure 26.7. Turkey: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Agriculture uses about 85% of the freshwater abstracted by all sectors. Water stress is increasing and above the OECD average (Table 26.4). Average precipitation is expected to decline as a result of climate change, increasing stress on the hydrological system. Nitrogen and phosphorus balances have also been increasing, and phosphorus balance is well above the OECD average due to intensive livestock production. Agriculture represents 4.3% of energy use, below its share of GDP (6.7%), but it accounts for a relatively high share of national GHG emissions (13.4%).

Table 26.4. Turkey: Productivity and environmental indicators

	Turkey		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.8%	1.5%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	27.8	32.2	32.1	30.0
Phosphorus balance, kg/ha	8.0	8.7	3.4	2.9
Agriculture share of total energy use (%)	5.0	4.3	1.7	2.0
Agriculture share of GHG emissions (%)	14.2	13.4	8.6	9.7
Share of irrigated land in AA (%)	8.0	10.8	-	-
Share of agriculture in water abstractions (%)	75.4	84.7	46.3	43.7
Water stress indicator	18.6	26.1	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Burrell, A. and M. Kurzweil (2007), "Distortions to Agricultural Incentives in Turkey", *Agricultural Distortions Working Paper Series 48388*, https://doi.org/10.22004/ag.econ.48388. [2]

OECD (2021), *OECD Economic Surveys: Turkey 2021*, OECD Publishing, Paris, https://doi.org/10.1787/2cd09ab1-en. [4]

OECD (2016), *Innovation, Agricultural Productivity and Sustainability in Turkey*, OECD Food and Agricultural Reviews, OECD Publishing, Paris, https://doi.org/10.1787/9789264261198-en. [1]

OECD (2011), *Evaluation of Agricultural Policy Reforms in Turkey*, OECD Publishing, Paris, https://doi.org/10.1787/9789264113220-en. [3]

27 Ukraine

This chapter considers policy developments until early February 2022. Russia's large scale aggression against Ukraine implies a fundamental change in the policy context with the need to keep the agricultural sector functioning superseding all other agricultural policy concerns. As the situation continues to evolve, no 'Assessment and recommendations' are provided at this stage.

Support to agriculture

Support to agricultural producers in Ukraine, measured by the producer support estimate (PSE), is low compared to other countries. The PSE was volatile over the past three decades, mostly due to fluctuations in market price support (MPS). In recent years, however, PSE fluctuations narrowed around zero, averaging 1.7% of gross farm receipts during 2019-21.

Over most of the past two decades, MPS was negative, with average producer prices below international reference levels but with significant variation across commodities and time. Due to tariff protection, domestic prices for meat products and sugar were above international reference levels, while those for most crops and milk were generally below world prices. In recent years, the overall impact of government intervention on prices was likely limited and, since 2018, total MPS for the sector has been slightly positive.

Single commodity transfers (SCTs) mostly comprise MPS, with sugar, rye, and pig meat receiving the highest support, while oats and, to a lesser extent, milk and sunflower seeds are implicitly taxed.

Budgetary support to producers, mainly in the form of tax benefits and input support for short-term loans and fixed capital formation, represents less than 1% of gross farm receipts but contributed to positive overall producer support during the last four years. Additional support was provided since 2020 in the context of the COVID-19 pandemic but remained small, representing 0.4% of budgetary support to producers in 2020 and 1.8% in 2021.

Support for general services increased since 2015 but remains low compared to other countries. During 2019-21, the general services support estimate (GSSE) averaged 0.6% of the value of agricultural production, half the levels of the early 2000s. Most of these expenditures go to inspection and control services, and agricultural schools. Total support to the sector increased slightly in relative terms, from an average of 0.4% of GDP in 2000-02 to 0.6% in 2019-21.

Recent policy changes

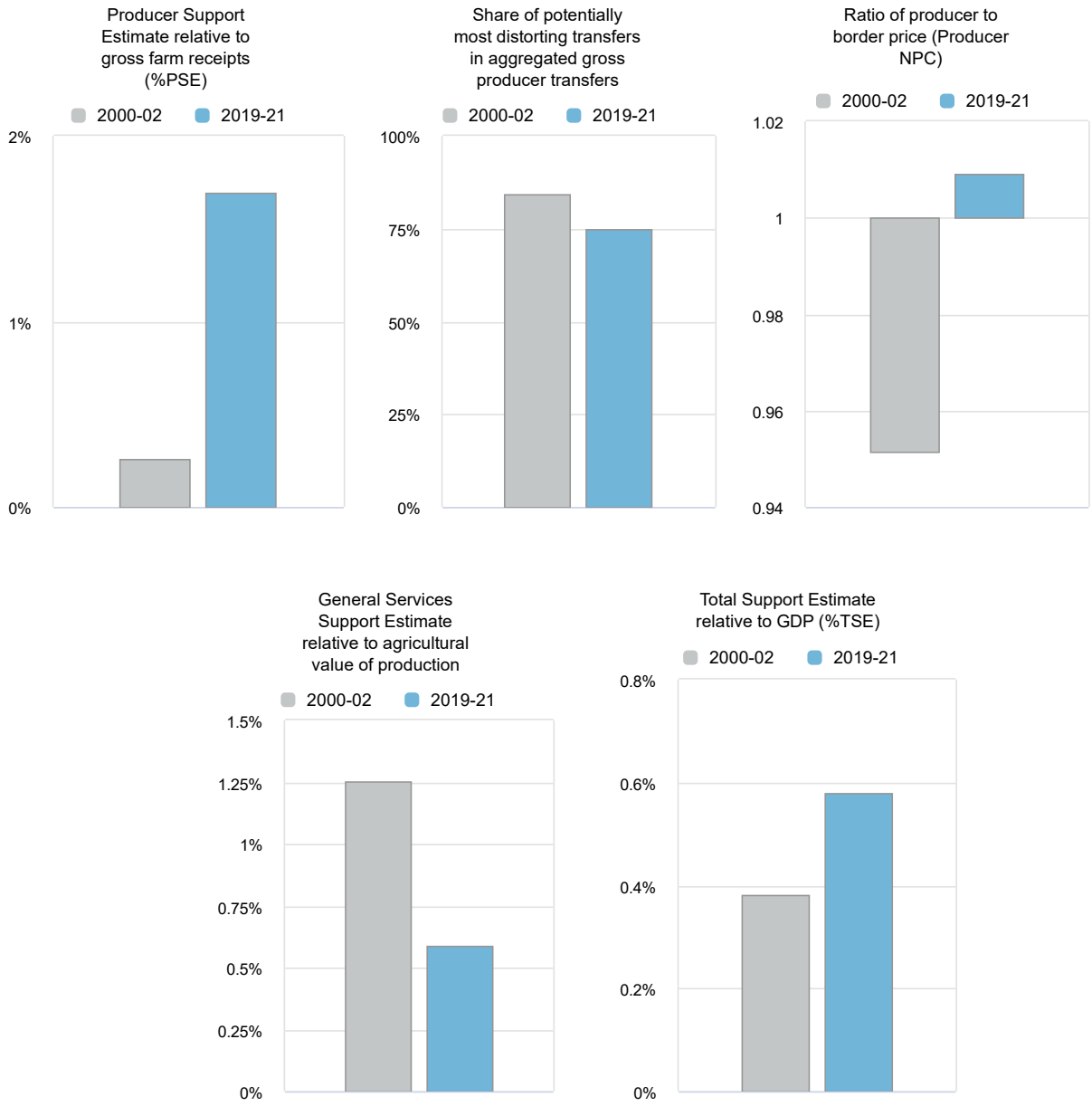
The government continued to develop legislation to strengthen the market for agricultural land. As of July 2021, citizens of Ukraine can purchase up to 100 hectares of land, while this possibility is scheduled to extend to purchases of up to 10 000 hectares from January 2024 by Ukrainian citizens and Ukrainian legal entities. New laws were adopted relating to land documentation, registration and valuation, and the management of state-owned land.

A new Fund for Partial Credit Guarantees in Agriculture was established, providing credit guarantees to small and medium-sized farms, and agricultural enterprises cultivating up to 500 hectares of land. Legislation was also passed introducing state support for agricultural insurance, reimbursing agricultural producers with up to 60% of the cost of insurance payments.

Several legal acts were put in place relating to the environment, including a National Action Plan for Environmental Protection until 2025, and laws to strengthen protection of forests and peatlands, encourage large-scale afforestation, and support the development of organic farming.

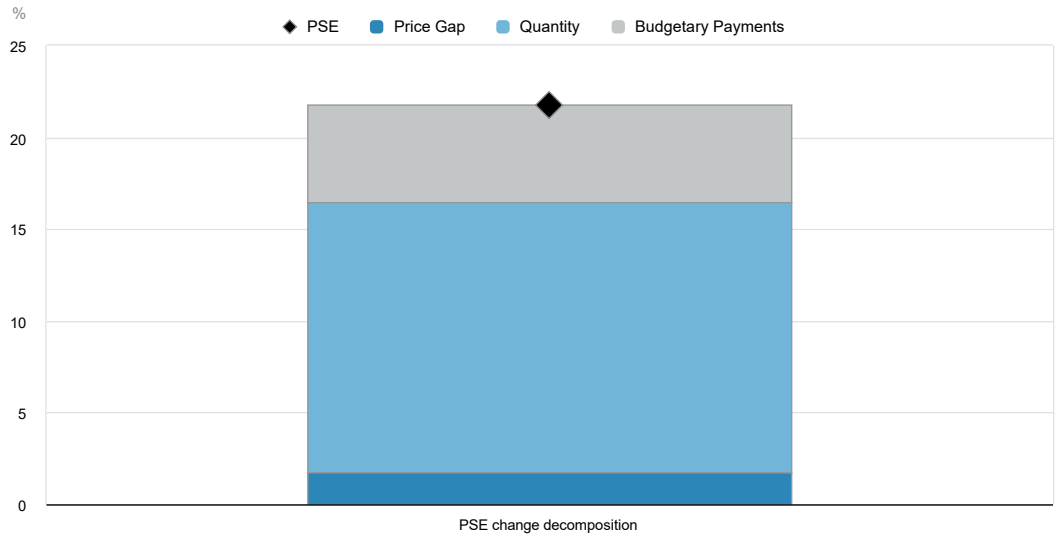
A new free trade agreement (FTA) between Ukraine and Turkey was signed in February 2022. Reforms were also introduced under Ukraine's Association Agreement with the EU to improve sanitary standards for the export of animal products.

Figure 27.1. Ukraine: Development of support to agriculture



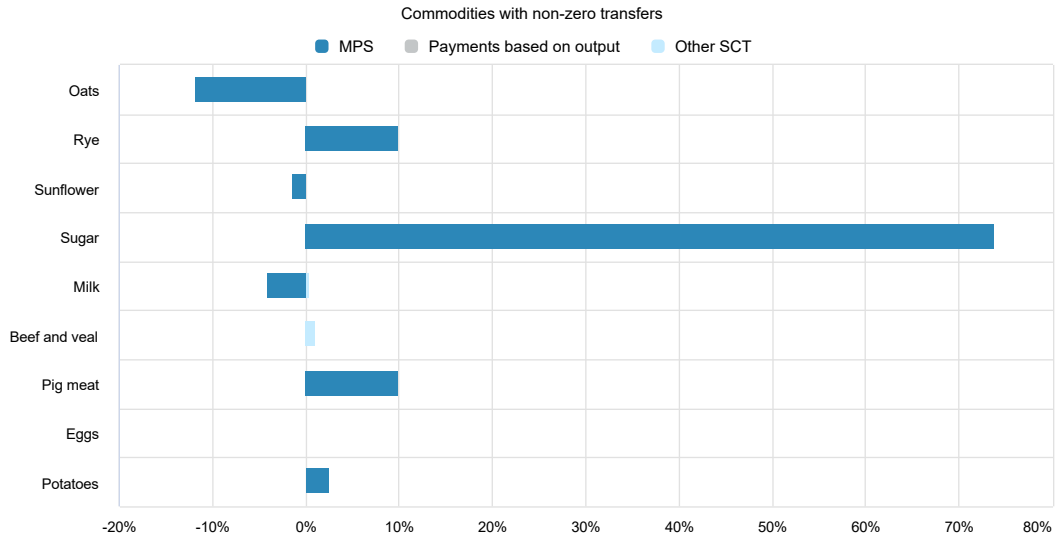
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 27.2. Ukraine: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 27.3. Ukraine: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 27.1. Ukraine: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**9 619**	**40 481**	**35 426**	**34 579**	**51 437**
***of which:** share of MPS commodities (%)*	86.77	84.88	84.45	84.74	85.44
Total value of consumption (at farm gate)	**8 841**	**26 998**	**25 202**	**24 112**	**31 680**
Producer Support Estimate (PSE)	**24**	**699**	**1 018**	**490**	**590**
Support based on commodity output	-443	376	684	184	261
Market Price Support[1]	-560	376	684	184	261
Positive Market Price Support	389	600	891	359	551
Negative Market Price Support	-948	-224	-207	-175	-289
Payments based on output	116	0	0	0	0
Payments based on input use	203	135	120	135	150
Based on variable input use	169	37	23	39	48
with input constraints	0	0	0	0	0
Based on fixed capital formation	31	98	97	95	102
with input constraints	0	0	0	0	0
Based on on-farm services	2	0	0	0	1
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	265	188	214	172	178
Based on Receipts / Income	265	161	166	160	158
Based on Area planted / Animal numbers	0	27	48	12	20
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**0.26**	**1.70**	**2.85**	**1.41**	**1.14**
Producer NPC (coeff.)	**0.95**	**1.01**	**1.02**	**1.01**	**1.01**
Producer NAC (coeff.)	**1.00**	**1.02**	**1.03**	**1.01**	**1.01**
General Services Support Estimate (GSSE)	**121**	**238**	**222**	**224**	**268**
Agricultural knowledge and innovation system	51	71	68	71	75
Inspection and control	26	152	138	141	177
Development and maintenance of infrastructure	36	4	6	2	5
Marketing and promotion	1	0	0	0	0
Cost of public stockholding	1	2	4	3	0
Miscellaneous	7	8	6	7	10
Percentage GSSE (% of TSE)	**..**	**25.53**	**17.90**	**31.32**	**31.22**
Consumer Support Estimate (CSE)	**408**	**-367**	**-694**	**-192**	**-214**
Transfers to producers from consumers	501	-333	-632	-174	-194
Other transfers from consumers	-38	-30	-56	-17	-17
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	-55	-3	-6	-1	-3
Percentage CSE (%)	**4.58**	**-1.34**	**-2.75**	**-0.80**	**-0.68**
Consumer NPC (coeff.)	**0.95**	**1.01**	**1.03**	**1.01**	**1.01**
Consumer NAC (coeff.)	**0.96**	**1.01**	**1.03**	**1.01**	**1.01**
Total Support Estimate (TSE)	**145**	**937**	**1 240**	**714**	**858**
Transfers from consumers	-463	363	688	191	211
Transfers from taxpayers	646	604	608	540	664
Budget revenues	-38	-30	-56	-17	-17
Percentage TSE (% of GDP)	**0.38**	**0.58**	**0.81**	**0.46**	**0.49**
Total Budgetary Support Estimate (TBSE)	**705**	**561**	**556**	**530**	**596**
Percentage TBSE (% of GDP)	**1.83**	**0.35**	**0.36**	**0.34**	**0.34**
GDP deflator (2000-02=100)	**100**	**1 492**	**1 423**	**1 562**	**..**
Exchange rate (national currency per USD)	**5.38**	**26.70**	**25.85**	**26.96**	**27.29**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Ukraine are: wheat, maize, rye, barley, oats, sunflower, sugar, potatoes, milk, beef and veal, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

Prior to the 1990s, central planning regulated all sectors of Ukraine's economy, including agriculture, as part of the Soviet Union. The state administered prices, and state enterprises controlled production, marketing of agricultural inputs and outputs, and processing and distribution of food (von Cramon-Taubadel et al., 2008[1]).

The first reforms began at the end of the 1980s, when the country started to transition towards a market-based economy. The ability to lease land from collective farms or individuals facilitated private agricultural production, enabling the establishment of family farms (von Cramon-Taubadel et al., 2008[1]).

However, Ukraine went through an economic crisis in the early 1990s, involving significant economic contraction and inflation that impacted the agricultural sector and resulted in substantial reductions in agricultural output and productivity. Consequently, several trade and price liberalisation policy reforms were reversed in the mid-1990s. Renewed reforms in agribusiness privatisation and collective farm restructuring intensified only after macroeconomic stabilisation in the 2000s (OECD/The World Bank, 2004[2]). While prior to the 1990s, the state owned all land,[1] today about three-quarters of agricultural land is private property (StateGeoCadastre, 2017[3]).[2]

In 2005, the State Agrarian Fund was established as a state-owned public joint stock company (reorganised in 2013). Its initial mandate was to regulate grain prices through intervention purchases, to store grain in state-owned silos and sell it to bakeries to guarantee bread prices, and to provide loans to grain producers. The fund progressively became involved in other activities, such as state purchases and sales of a broad range of agricultural and food products; forward contracts; flour processing and wholesaling; and sales of fuel and mineral fertilisers to producers (OECD, 2015[4]). The government budget has not allocated funds to the State Agrarian Fund since 2016, resulting in fewer state interventions in agricultural markets.

Two key events helped shape agricultural policies in Ukraine. First, in 2008, Ukraine became a member of the WTO, setting its agricultural bound tariffs at an average of 10.8%, expanding its export opportunities, and contributing to changes in the system of state support for agriculture. Second, in 2014, the European Union and Ukraine signed the Deep and Comprehensive Free Trade Area (DCFTA) as part of their Association Agreement. The DCFTA formally entered into force in September 2017, and involves tariff reductions and duty-free import quotas to facilitate trade between Ukraine and the European Union, including in agricultural and food products.

From 1999 to 2016, the state provided significant support through VAT accumulation, based on an agriculture-specific VAT regime. Agricultural producers accumulated in special bank accounts the VAT due on their primary and processed products. The accumulated funds were directed to cover VAT on purchased inputs, with the residual available for any other production purpose. From 2014 to 2016, this mechanism provided 90% of total state support. Other domestic policy measures notably comprised input subsidies, tax concessions, price controls, import tariffs, non-tariff trade regulation, minimum purchase prices, direct state purchases, and preferential loans (Table 27.2).

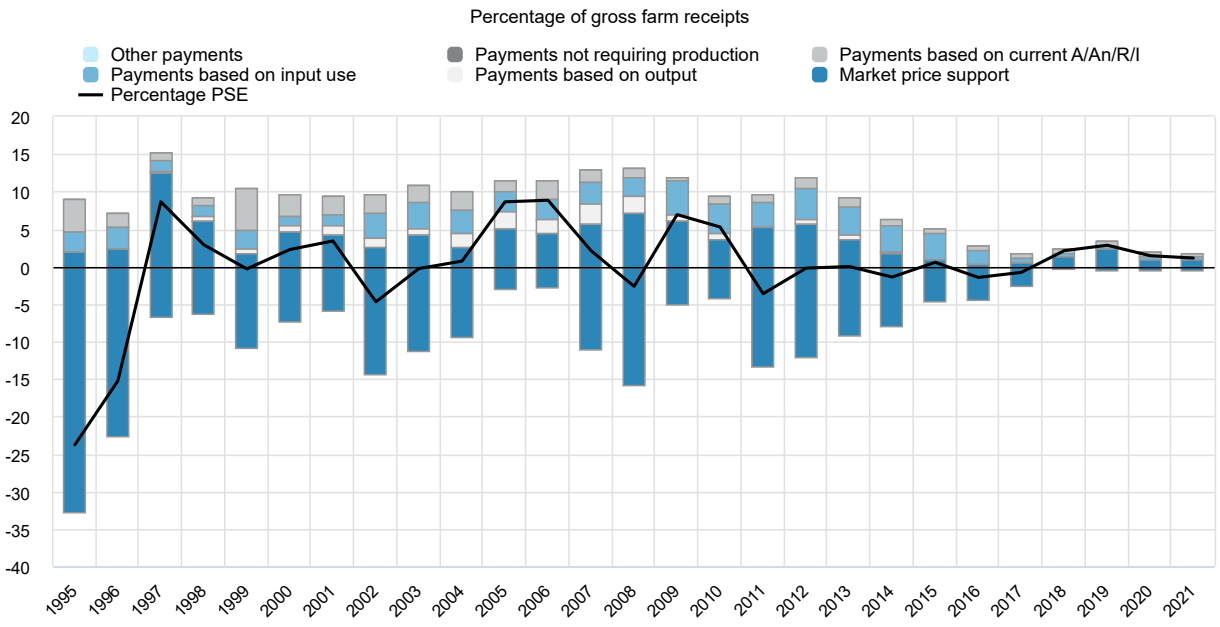
A moratorium banning the sale of agricultural land was put in place in 2002, although leasing for cultivation was permitted. The moratorium was extended annually until and including 2019. It was not formally extended into 2020. From July 2021, a new law came into force that lifts the ban on the sale of agricultural land and grants individual citizens the right to purchase up to 100 hectares of land. From January 2024, larger purchases of up to 10 000 hectares will be permitted for Ukrainian citizens and Ukrainian legal entities.

Table 27.2. Ukraine: Agricultural policy trends

Period	Broader framework	Changes in agricultural policies
Prior to 1990s	Planned economy	Planned agricultural production, state administered prices State controlled value chain and agricultural trade, including marketing of agricultural inputs and outputs
1990-2000	Transition economy: gradual reforms towards market economy Interrupted by deep economic crisis in the early 1990s	Increased import tariffs for agricultural and processed food products Land reform to allow private ownership Gradual dismantling of centralised marketing schemes Reversal of reforms during economic crisis
2000-present	Renewed reforms towards an open economy	Reduction of agricultural tariffs following WTO accession Export taxes and quotas for main exported products, successively eliminated or replaced by MoUs State Agrarian Fund (price controls, production controls, marketing, loans, etc.) with market interventions through minimum reference prices and state food purchases successively reduced Sugar production quotas until 2018 Various subsidies for inputs, interest support and tax concessions

Due to the negative market price support only partly offset by transfers to producers through tax concessions and other measures, support to agricultural producers was negative for most of the 1990s. While the level continued to fluctuate over the recent decade, it has been closer to zero (Figure 27.4). With little budgetary support to general services or consumers, total support to the sector remained small for most of the past 25 years.

Figure 27.4. Ukraine: Level and PSE composition by support categories, 1995 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Ministry of Agrarian Policy and Food (MAPF) is the main executive body in Ukraine in charge of the development of agriculture. Between September 2019 and January 2021, MAPF was integrated into the Ministry of Economic Development, Trade and Agriculture (MEDTA). At the beginning of 2021, MAPF was restored. A resolution adopted by the Cabinet of Ministers of Ukraine (CMU) in February 2021 defines the functions of MAPF, including the formation and implementation of state policy in a range of areas including agriculture, fisheries, food security, rural development, and land management.

Ukraine's agricultural policy measures are formulated in a number of major laws and decisions. The law On State Support of Agriculture in Ukraine, adopted in 2004, defines the key policy priorities and measures of agricultural support.

Agricultural producers are eligible for a Single Tax[3] set as a percentage of normative agricultural land values established on 1 July 1995 and adjusted since with the general consumer price index. Introduced in 1998, the Single Tax originally replaced twelve taxes for which agricultural enterprises were liable as business entities. The scope of this tax has narrowed since. At present, the Single Tax replaces three taxes – profit tax, land tax (for land used in agricultural production), and a special water use fee – with agricultural producers liable for all other taxes previously included in the Single Tax. The Single Tax regime generates implicit tax benefits to agricultural producers, estimated to be around UAH 4.3 billion (USD 150 million) annually in recent years.

The annual law On the State Budget of Ukraine defines the financial scope of agricultural subsidy policies. In 2021, the allocation of subsidies to agricultural producers grew to UAH 4.7 billion (USD 166 million), a substantial increase in local currency terms compared with the allocation of UAH 4.0 billion in 2019 and 2020.

In addition to the Single Tax regime, the general budget programme On Financial Support of Agricultural Producers provides a range of ongoing measures targeted to specific activities, such as partial compensation for the costs of agricultural machinery and equipment, and interest rate subsidies on bank loans. For livestock producers, these also include interest rate support for loans funding livestock husbandry and breeding; partial reimbursement of costs related to the construction and reconstruction of animal farms and buildings; per head payments for cows to agricultural enterprises and for young cattle to rural households; and partial compensation to agricultural producers purchasing high-breeding animals, semen and embryos. In turn, on the crop side, support is provided in the form of reimbursements for different types of on-farm investments and debt repayments.

As per a CMU Resolution from June 2017, no market price regulation of food products has taken place since July 2017. However, the State Material Reserve of Ukraine (SRU) procures and holds emergency reserves for a range of products, including agriculture and food products. Purchases are made through open tenders.

The law On Agricultural Cooperation entered into force in November 2020, regulating issues related to the creation, management and dissolution of agricultural co-operatives. It eliminates the former differentiation between production and service co-operatives and defines co-operative education as a priority task of agricultural co-operatives.

Ukraine has been a member of the WTO since May 2008. The country charges import tariffs on most agricultural products, with applied most-favoured-nation (MFN) tariffs for agricultural products averaging at 9.1%, well above the average for non-agricultural products at 3.7% (WTO, 2021[5]). While most imports face *ad valorem* tariffs, Ukraine maintains a global tariff-rate quota for raw cane sugar. This quota was only used in 2011 and 2021, given the excess sugar supply on the Ukrainian market in other years. Export duties are applied to some oilseeds, live animals and raw hides, but have gradually decreased following Ukraine's accession to the WTO.

The Association Agreement with the European Union, ratified by Ukraine in 2014, increasingly influences the country's policies. On 27 June 2014, the European Union and Ukraine signed the Deep and Comprehensive Free Trade Area (DCFTA) as part of their Association Agreement. It applied provisionally from 1 January 2016 and formally entered into force on 1 September 2017. Trade liberalisation between the European Union and Ukraine is to be implemented over a transition period of seven to ten years. The European Union is to open tariff rate quotas (TRQs) for duty-free imports for Ukraine's principal agro-food products, such as grain, meat and milk products, and sugar, and to grant free access for the others. Ukraine is to reduce import duties for a number of goods from the European Union. About 40% of agriculture-related import duties were reduced to zero immediately after the Agreement entered into force, and around half of import duties will be eliminated during the transition period. For about 10% of tariff lines – covering selected products in product categories such as dairy and eggs, sugar, miscellaneous edible products, animal oils and fats, and feeding stuff for animals – Ukraine maintains TRQs with zero in-quota tariffs. Since 1 January 2016, Ukraine applies three TRQs with zero in-quota tariffs for imports from the European Union of pig meat, poultry meat and poultry meat preparations, and sugar, respectively. The parties committed to apply no export subsidies for mutually traded agricultural goods.

The DCFTA incorporates fundamental WTO rules on non-tariff barriers, such as prohibition of import and export restrictions, and disciplines on state trading. However, Ukraine's difficulty complying with EU food safety, veterinary and phytosanitary requirements remains a barrier for trade integration. Thus, the DCFTA contains provisions for technical regulations, standards and conformity assessments to harmonise with those of the European Union, as well as for technical co-operation in the field of regulations, standards and related issues between Ukraine and the European Union. In line with these provisions, the Comprehensive Strategy of Implementing Legislation on Sanitary and Phytosanitary Measures was approved in 2016 and provides a process for harmonisation of Ukraine's SPS legislation with EU requirements.

Other free trade agreements (FTAs) with Ukraine include the FTA with the European Free Trade Association (EFTA) in force since June 2012, the multilateral FTA with the Commonwealth of Independent States (CIS)[4] in force since August 2012 as well as bilateral ones with all CIS members, and the Canada-Ukraine FTA, in force since August 2017. FTAs with Israel and the United Kingdom entered into force in January 2021. In February 2022, Ukraine and Turkey signed a new FTA.

In July 2019, the CMU approved the Strategy for the development of exports of agricultural and food products for the period up to 2026. It focuses on product competitiveness, an expanded range of export products, Ukrainian food brands, and supporting information and analysis on agro-food exports.

Climate change mitigation policies in agriculture

In 2019, agriculture contributed 42.5 $MtCO_2eq$ or 12.8% of Ukraine's greenhouse gas (GHG) emissions. Nitrous oxide (N2O) is the largest source of emissions (78% of total GHG emissions from agriculture), followed by methane (21%). Agricultural emissions have decreased by 51% compared to 1990 levels, but rose by 27% since 2010.

Ukraine signed the Paris Agreement of the United Nations Framework Convention on Climate Change in April 2016 and ratified it in September 2016. Ukraine's updated Nationally Determined Contribution (NDC), approved by the CMU in July 2021, proposes to reduce economy-wide emissions by 65% relative to 1990 levels by 2030 and achieve carbon neutrality no later than 2060.[5] The NDC covers a range of economic sectors, including energy, industrial processes and product use, agriculture, land use, land-use change and forestry, and waste (UNFCCC, 2021[6]). However, no sector-specific targets were set for agriculture. In October 2021, Ukraine joined the Global Methane Pledge, an initiative launched by the European Union and United States that aims to reduce global methane emissions at least 30% from 2020 levels by 2030, which could eliminate over 0.2˚C of warming by 2050.

In December 2016, the CMU adopted the National Concept for the Implementation of State Policy in the Field of Climate Change to 2030. The CMU approved the Action Plan for the implementation of this Concept in late 2017, while it approved the Strategy for Low Carbon Development of Ukraine to 2050 (SLCD) in July 2018. The SLCD defines a co-ordinated approach by various parties and provides a national vision for decoupling economic growth and social development from an increase of GHG emissions.

The goal of becoming a carbon-neutral country by 2060 is enshrined in the National Economic Strategy to 2030, approved by the CMU in March 2021. The strategy includes a State Policy in the Agri-Industrial Sector on Environmental Protection and Management of Natural Resources in Agriculture, which aims to approximate and harmonise national legislation and policy with the EU Green Deal, introduce a national report on GHG emissions in agriculture, and introduce economic incentives for sustainable land use and improving soil fertility.

The Law On Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions came into force in March 2020 and applies from January 2021, reflecting Ukraine's obligations under international agreements including the UN Framework Convention on Climate Change and the 2015 Paris Agreement. Ukraine's GHG emission monitoring legislation will be adapted to EU legislation, in line with Ukraine's EU Association Agreement. Following the adoption of this law, the Procedure for Maintaining the Unified Register for Monitoring, Reporting and Verification of Greenhouse Gas Emissions was approved by an order of the Ministry of Environmental Protection and Natural Resources (MEPR) in June 2021.

The Ministry of Agrarian Policy and Food (MAPF) and MEPR are developing measures in line with obligations under Ukraine's EU Association Agreement to improve environmental practices, mitigate agricultural emissions and support the adaptation of agriculture to climate change. Policies and measures to support emissions reduction efforts in agriculture include (MEPR, 2021[7]):

- introduction of minimum-tillage techniques and a ban on stubble burning in fields
- support for land protection activities and the restoration of windbreaks
- harmonisation with EU legislation of domestic regulations relating to the distribution and use of pesticides and agrochemicals
- introduction of the best agricultural practices for zones vulnerable to nitrate pollution
- support for returning and restoring degraded land (purchase by state or payment for decommissioning)
- supporting the use of manure at all stages – production, processing, storage, transportation and application – and its utilisation in biogas production
- supporting the development of organic agriculture and observance of crop rotations.

In line with these objectives, the Presidential decree On Some Measures for the Preservation and Restoration of Forests entered into force in June 2021. The decree outlines plans to implement the Green Country large-scale afforestation of Ukraine initiative, which aims to plant one billion trees over the next three years, and increase forested areas by one million hectares over the next ten years.

Domestic policy developments in 2021-22

Changes to the legal framework

The National Economic Strategy until 2030, approved by the CMU in March 2021, is the basis for the development of new legislation, action plans and strategic programmes by government ministries and other central executive bodies. It aims to establish Ukraine as one of the global centres of food security, and a world leader in the supply of high value-added food and technology-intensive services for the agri-food sector. The strategy includes seven strategic goals for the agricultural and food sectors: ensuring a stimulating and advisory agricultural policy (strengthening institutional capacity, improving the efficiency of

policy making, improving the land market); providing market players with high quality infrastructure; improving access to inputs and technology; balancing the production of high and low-margin products to increase the profitability of the sector; facilitating the development of markets for processing; increasing sales of high-value products in domestic and international markets; and ensuring the production and export of safe and healthy agricultural and food products.

In March 2021, a new resolution On Approval of Model Statutes of an Agricultural Co-operative was introduced by the CMU. The new model constitutional documents regulate the legal status, rights, responsibilities and relations of members and associate members of co-operatives, as well as the formation, management and termination of economic activities of agricultural co-operatives.

Several legal acts have been put in place to regulate the development of a market for agricultural land:

The law On amendments to certain legislative acts of Ukraine concerning the conditions of turnover of agricultural lands was adopted by the parliament in March 2020. The law came into force on 1 July 2021, effectively ending the ban on the sale of agricultural land by granting individual citizens of Ukraine the right to purchase up to 100 hectares of land. From 1 January 2024, purchases of up to 10 000 hectares will be possible for Ukrainian citizens as well as for legal entities whose founders or final beneficiaries are Ukrainians, and which do not have businesses registered abroad or in offshore companies. The sale of land to foreigners remains prohibited and can become legal only through a referendum. The sale of state- or communally-owned agricultural land also remains prohibited. A Presidential Decree in October 2020 charges the CMU to work on facilitating the transfer of state-owned agricultural land to communal ownership, and on draft laws on the support to private farms, the improvement of land management and land deregulation.

The law On amendments to certain legislative acts of Ukraine on improving the system of management and deregulation in the sphere of land relations was adopted in April 2021 and entered into force in May 2021. The law transfers state lands outside of settlements to communal ownership of village, settlement and city councils, approves changes in the purpose of private land outside settlements by local governments, and ensures state control over the use and protection of land by village, settlement and city councils. It also streamlines administrative procedures relating to permits and land management documentation, reducing the time and cost of procedures related to land management.

The law On amendments to certain legislative acts of Ukraine concerning the sale of land plots and acquisition of the right to use them through electronic auctions entered into force in July 2021. The law calls for land auctions to be conducted through a state-owned electronic trading system, introduces a minimum guarantee fee for bidders, and outlines the procedures for the functioning and administration of the electronic trading system.

In June 2021, the CMU approved the resolution On approval of the procedure for verification of compliance of the purchaser or owner of agricultural land with the requirements specified in Article 130 of the Land Code of Ukraine. The resolution outlines the procedure for notarisation of data on the buyer of land, which was the final step in preparations for the opening of the land market.

The law On amendments to certain legislative acts of Ukraine concerning the stimulation of farms was adopted by the parliament in September 2021, and entered into force in October 2021. The law specifies the composition of farm lands and determines the recipients of state support. Newly created farmsteads, family farms, and farms located in mountain settlements are eligible for assistance from the state budget within the first three years of their establishment. The law also provides additional state support to family farms for the payment of their obligatory national social insurance fees, as well as financial assistance to farms that are headed by individuals under the age of 35.

In June 2021, the CMU approved the resolution On the functioning of the State Agrarian Register, which approves the procedure for maintaining and administering the State Agrarian Register and its data. The

Register was created in November 2020 as a single state information system to integrate information on agricultural producers and their property.

The government resolution On approval of the methodology of normative monetary valuation of land plots was adopted and entered into force in November 2021. The resolution sets out new rules for calculating the normative monetary valuation of land, based on the unification of three previously existing valuation methods for land: settlements, non-agricultural purposes outside settlements, and agricultural purposes.

The law On the Fund for Partial Guarantee of Loans in Agriculture was adopted and entered into force in November 2021. The government established the Fund for Partial Credit Guarantee in Agriculture, a specialised non-bank financial institution that provides credit support and guarantees the repayment of loans to small and medium-sized farms and agricultural enterprises cultivating up to 500 hectares of land. The law defines the procedures for forming the authorised capital of the fund, convening and making decisions by the governing bodies of the fund, and determining the eligibility criteria for businesses to obtain partial credit guarantees.

The law On Amendments to Certain Laws of Ukraine on Improving the Legal Regulation of Insurance of Agricultural Products with State Support was adopted and entered into force in July 2021. The law introduces state support for agricultural insurance, reimbursing agricultural producers with up to 60% of the cost of insurance payments. It also identifies the rights and obligations of insurance market participants, as well as the requirements for issuing insurance contracts with state support.

Whilst the agriculture-specific VAT special regime was abolished in 2017, several new amendments to the Tax Code were introduced in 2021. A reduced VAT rate of 14% was applied to certain agricultural products from February to July 2021.[6] Subsequently, the law On Amendments to the Tax Code of Ukraine on the Rate of Value Added Tax in the Taxation of Transactions for the Supply of Certain Types of Agricultural Products was adopted in July 2021, and entered into force in August 2021. The law restores the VAT rate at 20% for a range of products (live cattle; live pigs; live sheep; whole milk; rye; oats; flax seeds; other oilseeds; sugar beets), while maintaining the VAT rate at 14% for another group of agricultural products (wheat; barley; corn; soybeans; rapeseed; sunflower seeds).

The law On amendments to the Tax Code of Ukraine and other legislative acts of Ukraine to ensure balance of budget revenues was adopted in November 2021 and entered into force in January 2022. The law temporarily exempts certain agricultural producers, such as those involved in poultry, quail and ostrich breeding and production, from paying corporate income tax until 1 January 2027. At the same time, these agricultural producers will not be able to benefit from the simplified taxation scheme (the “single tax”).

A series of legal acts were put in place relating to environmental policies and organic agriculture:

- The National Action Plan for Environmental Protection until 2025 was approved by the CMU in April 2021.
- A law On Amendments to Certain Legislative Acts of Ukraine Concerning Strengthening Forest Protection, Prevention of Fires on Forest and Water Fund Lands, Peatlands and on Lands of Other Categories was adopted in February 2021 and entered into force in March 2021. The law increases the penalties for violations related to the burning of dry vegetation or its remnants.
- Continuing the legislative work on the development of the organic products sector, the law On Amendments to Section XI “Transitional Provisions” of the Law of Ukraine “On the basic principles and requirements for organic production, circulation and labelling of organic products” was adopted in July 2021. The law includes provisions to legalise international organic labelling for Ukrainian producers of organic products, guarantee state support to producers, counteract the spread of fake organic products on the shelves of retail chains, and abolish fines for producers for violating the law On Basic Principles and Requirements for Organic Production, Circulation and Labelling of Organic Products.

- The CMU resolution On approving the criteria for assessment of the level of risk arising from a certification body's economic activity in the sphere of organic production, circulation and labelling, and determining the frequency of planned actions of state supervision (control) by the State Service of Ukraine on Food Safety and Consumer Protection entered into force in October 2021. The resolution defines and approves the criteria for assessing the level of risk from the certification body's economic activity in the field of organic production, circulation and labelling of organic products.

The law On veterinary medicine was adopted in February 2021, introducing amendments to the law On animal by-products not intended for human consumption of October 2016. The law brings its provisions in compliance with the requirements of EU legislation by harmonising the relevant terminology, categorisation of animal by-products, procedures for handling various categories of animal by-products, and procedures for registering facilities.

Changes in agricultural support measures

Several new support programmes were introduced in 2021. These include:

- per-hectare payments for producers of buckwheat
- per-hectare payments for crop losses due to emergencies and natural disasters
- subsidies for cow herd expansion and subsidies for goats and sheep
- partial compensation paid to potato growers for the cost of storage refrigerators and workshops for primary processing
- partial compensation (per hectare payments) for irrigation sprinklers and drip irrigation
- financial support for newly established farms to receive agricultural advisory services.

The state budget for partial compensation of the cost of agricultural machinery and the equipment of domestic production was continued at a rate of 25% of the cost of purchased machinery and equipment. However, the additional subsidy under this programme for agricultural service co-operatives was discontinued.

Several government support programmes were discontinued. The state budget programme Financial support for the development of farms was terminated in 2021. The Seed subsidy, which provided partial compensation to producers for the cost of seeds, was not applied in 2020 and 2021.

Domestic policy responses to the COVID-19 pandemic

The State Programme of Economic Stimulation to Overcome the Negative Effects Caused by Restrictive Measures to Prevent the Occurrence and Spread of the Acute Respiratory Disease COVID-19 caused by Coronavirus SARS-CoV-2 for 2020-2022 continued in 2021. The programme includes measures to provide access to finance for agricultural producers, ensure that agricultural products continue to be available on the market, enhance market monitoring for food products and other essential goods, develop a unified and simplified assessment of agricultural land values, develop digital tools to facilitate the sale and promotion of agricultural products and services, and improve conditions for the development of organic agriculture.

Long loaf (a type of white bread) and sunflower oil were added to the list of food products for which price increases of more than 5% must be declared in advance by food retailers. This measure was introduced under a CMU resolution from December 2021.

The CMU also introduced a resolution in December 2021 limiting the cost of natural gas for producers of flour, bread, milk, chicken and sunflower oil until April 2022, by setting the maximum level of surcharge on the price of government-produced natural gas at no more than 24%.

A number of economy-wide financial support measures were also introduced in response to the COVID-19 pandemic. For instance, the Entrepreneurship Development Fund provides low-interest loans and partial loan guarantees to support MSMEs across all sectors of the economy, including agriculture.

Trade policy developments in 2021-22

The Russian large scale aggression against Ukraine has created a significant change in the landscape of trade and trade policies in Ukraine. The material below is based on information collected prior to the Russian aggression against Ukraine and has to a large extent been overtaken by recent events. As outlined in the dedicated section in Chapter 2 of this report, the war, as well as subsequent policies implemented by Ukraine, have had and will continue to have significant implications for Ukraine's ability to trade. Given Ukraine's role as a major exporter of grains and oilseeds, this in turn affects international markets. The policy developments outlined in this section will therefore need to be understood against this background.

In February 2022, Ukraine and Turkey signed a free trade agreement. According to preliminary forecasts, the agreement will increase trade with Turkey from USD 7.5 billion to USD 10 billion over a period of five years.

A number of trade policy developments were driven by Ukraine's obligations under the EU Association Agreement and DCFTA. On 1 January 2021, duties on wine imports from the European Union were reduced from 0.3-0.4 EUR per litre to zero. EU tariff rate quotas for animal products implemented under the DCFTA have not been fully used, and those for beef, pork and lamb have never been used at all. Aiming to increase exports of animal products into the European Union, Ukraine is working towards meeting the relevant sanitary standards. By February 2021, EU veterinary services had certified four poultry plants and 26 dairy processing enterprises, permitting them to export to the European Union. In parallel, the European Union has gradually increased its duty-free import quotas for Ukrainian poultry and processed poultry meat.

In October 2021, the Ukrainian Parliament adopted the law On amendments to certain legislative acts of Ukraine concerning the harmonisation of the legislation of Ukraine in the field of childhood nutrition with EU legislation. The law will come into force in May 2022, and aims to bring Ukrainian legislation on the production and sale of baby food in line with EU laws and regulations. This includes changes in product labelling, the abolition of ineffective and burdensome requirements, and strengthening compliance with relevant technical standards and regulations.

Since 2011, the MAPF has negotiated a Memorandum of Understanding (MoU) between the Ministry and key grain market participants on an annual basis, to ensure food security, avoid the application of export restrictions, ensure projections for grain exports are realised, and maintain stability in the Ukrainian grain market. The MoU between MAPF and grain market participants for the 2020/2021 marketing year was signed in July 2020. The Annex to that agreement was signed in August 2020, and indicates maximum export volumes of 17.5 million tonnes of wheat and 1 000 tonnes of rye. In June 2021, the maximum volume of corn exports was agreed at 24 million tonnes. A new MoU for the 2021/2022 marketing year was signed in July 2021, with its Annex agreed in October 2021. It indicates maximum export volumes of 25.3 million tonnes of wheat.

A ban on imports of agricultural goods from the Russian Federation and the suspension of trade preferences under the CIS FTA, in place since December 2015, was extended until the end of 2022. A CMU resolution adopted in April 2021 added wheat and sunflower oil to the list of banned agricultural imports.

The law On Amendments to Article 4 of the Law of Ukraine “On Pesticides and Agrochemicals” on the import of pesticides into the customs territory of Ukraine was adopted in June 2021 and entered into force in August 2021. It abolishes the mandatory state registration of pesticides that are imported into Ukraine for state testing and research.

Contextual information

Ukraine is classified by the World Bank as a lower-middle income economy. It has a comparatively large area of fertile arable land, contributing to agriculture’s position as a major sector of the economy compared to most other countries covered in this report. Although the sector’s relative importance has declined, it still accounts for 9% of the country’s economy and 14% of its employment. Agro-food exports represent around 45% of Ukraine’s total exports.

Four-fifths of Ukraine’s agricultural area is arable, and crops represent some three-quarters of agricultural output, up from two-thirds in the mid-1990s. Rural households and individual farmers accounted for 37% of Ukraine’s crop production and 53% of livestock production in 2018 (Nivievskyi, Iavorskyi and Donchenko, 2021[8]). Rural households are often subsistence-oriented, with a significant share of their produce being consumed without entering domestic markets and value chains. Corporate farms, mostly with limited liability or joint-stock companies, provide much of the remaining output.

Between 2013 and 2015, real GDP fell by 19% while annual inflation rates rose to almost 50%. From 2016 to 2019, the economy grew steadily at between 2.4% and 3.5% per year and inflation eased. In 2020, due to the COVID-19 pandemic and related restrictions to the economy, real GDP shrank by 4% while inflation decreased to less than 3%. The unemployment rate remained high, at 9.5% in 2020.

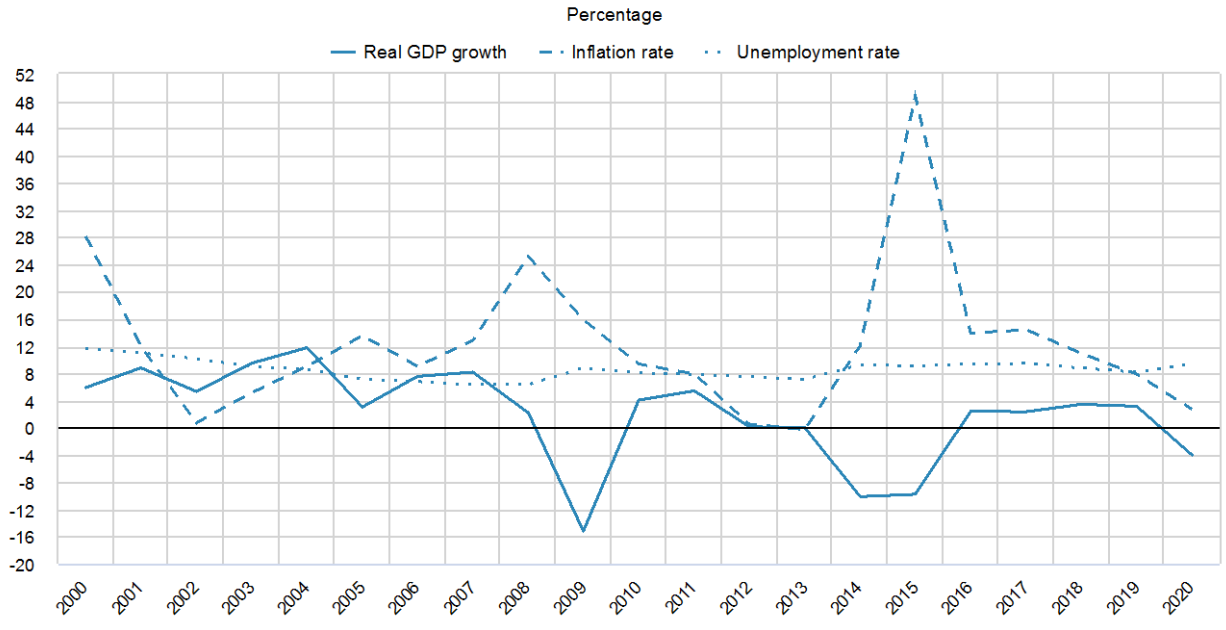
Ukraine is among the world’s leading exporters of agricultural commodities, in particular grains (wheat, barley, maize) and vegetable oils (rapeseed and sunflower oil). Its agro-food exports grew rapidly between 2000 and 2012, and export growth resumed after the drop between 2012 and 2015. Ukraine’s agro-food exports are mostly composed of primary and processed products for industry. Imports, in turn, are more mixed, with primary and processed products for final consumption representing about 68% of agro-food imports.

Table 27.3. Ukraine: Contextual indicators

	Ukraine		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	202	545	0.5%	0.5%
Population (million)	49	44	1.1%	0.8%
Land area (thousand km²)	579	579	0.7%	0.7%
Agricultural area (AA) (thousand ha)	41 406	41 311	1.4%	1.4%
			All countries[1]	
Population density (inhabitants/km²)	84	76	53	63
GDP per capita (USD in PPPs)	4 107	13 057	9 281	20 929
Trade as % of GDP	44	33	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	14.0	9.3	2.9	4.9
Agriculture share in employment (%)	25.1	14.1	-	-
Agro-food exports (% of total exports)	10.1	45.2	6.2	8.5
Agro-food imports (% of total imports)	6.1	10.6	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	59	78	-	-
Livestock in total agricultural production (%)	41	22	-	-
Share of arable land in AA (%)	79	80	32	34

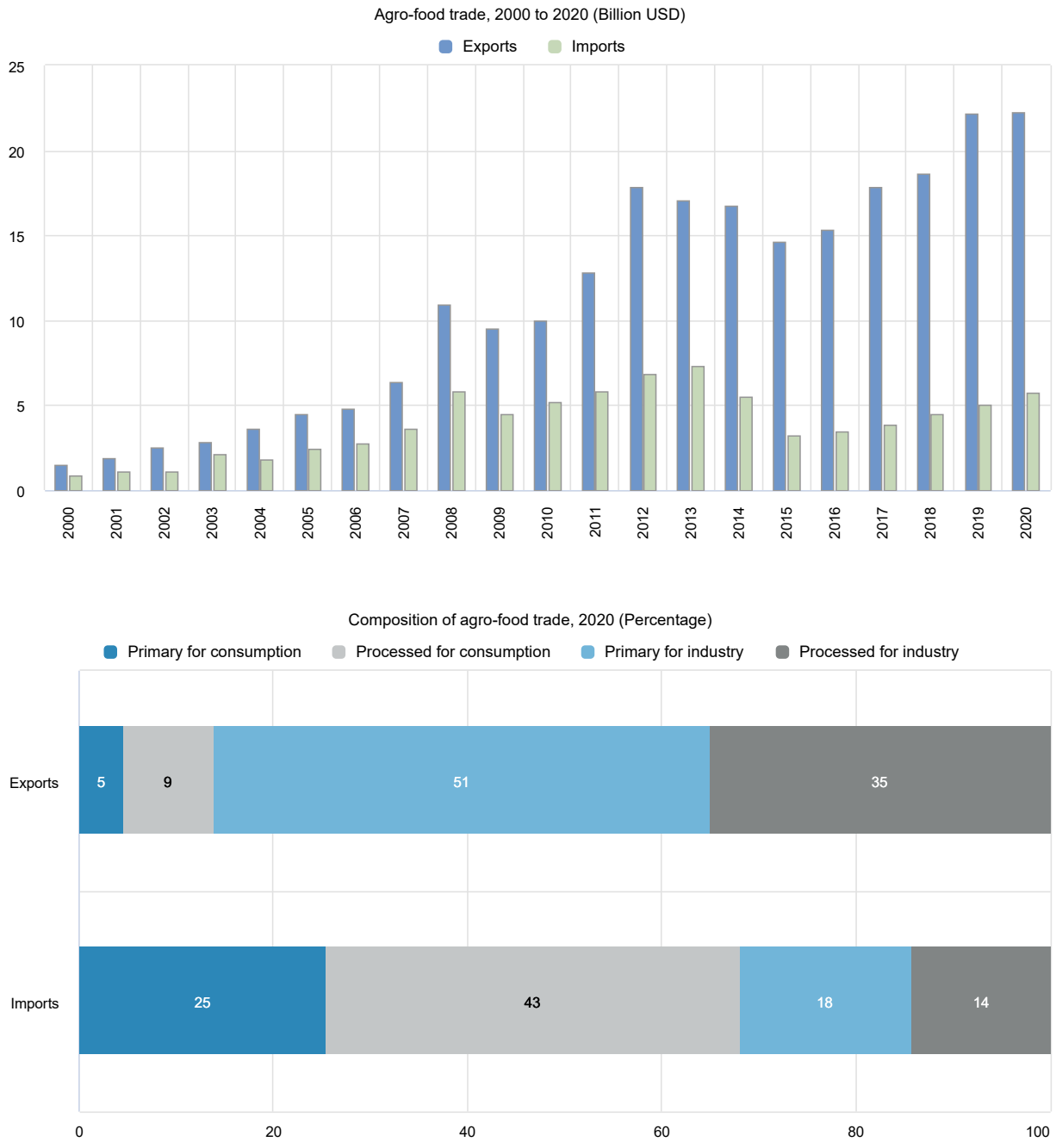
Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 27.5. Ukraine: Main economic indicators, 2000 to 2020



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 27.6. Ukraine: Agro-food trade

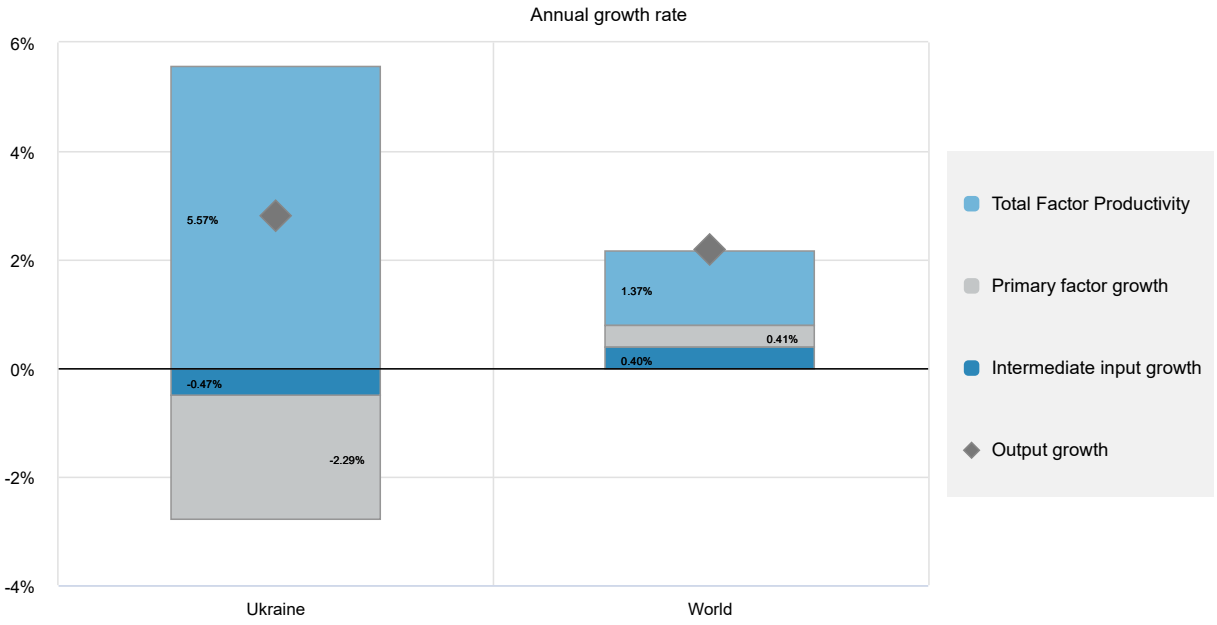


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Both agricultural output and total factor productivity grew at rates significantly above global averages, at 2.8% and 5.6% per year respectively in the decade ending in 2019. Intermediate inputs and the use of primary factors, notably of labour, shrank over the same period.

Despite the declining importance of agriculture within the economy, agriculture's shares in the country's energy use and GHG emissions have increased over the past two decades. In contrast, the average nitrogen balance has declined since 2000 and remains well below the OECD average. Data also suggest a nation-wide negative balance for phosphorous, which may pose challenges for sustainability in the long run.

Figure 27.7. Ukraine: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 27.4. Ukraine: Productivity and environmental indicators

	Ukraine		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	-1.8%	5.6%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	23.9	14.6	32.1	30.0
Phosphorus balance, kg/ha	2.6	-2.2	3.4	2.9
Agriculture share of total energy use (%)	2.1	3.7	1.7	2.0
Agriculture share of GHG emissions (%)	8.7	12.8	8.6	9.7
Share of irrigated land in AA (%)	5.8	5.3	-	-
Share of agriculture in water abstractions (%)	30.0	41.6	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Article 3 of the Land Code of the Ukrainian SSR, https://zakon.rada.gov.ua/laws/show/2874%D0%B0-07/ed19920101#Text.

[2] More recent estimates suggest that the share of private property in agricultural land is even higher, at 80%: Mykola Solsky (People's Deputy, Chairman of the Verkhovna Rada Committee on Agrarian and Land Policy), "It's all about the land", 2 April 2020, https://www.epravda.com.ua/columns/2020/04/2/658911/.

[3] Termed the "Fixed Agricultural Tax" before 2015.

[4] Other members and associate members include Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, Turkmenistan and Uzbekistan.

[5] Ukraine's first NDC submitted to the UNFCCC in 2016 committed to limiting its total emissions across sectors, including agriculture, to 60% of 1990 levels.

[6] The law On Amendments to the Tax Code of Ukraine Concerning the Value Added Tax Rate on Transactions for the Supply of Certain Types of Agricultural Products was adopted by the parliament in December 2020, and entered into force in February 2021. The law introduces a reduced VAT rate of 14% for agricultural products belonging to certain product groups (live cattle; live pigs; whole milk; wheat; rye; barley; oat; corn; soybeans; flax seeds; rapeseed, sunflower seeds; other oilseeds; sugar beets).

28 United Kingdom

Support to agriculture

The United Kingdom left the European Union (EU) on 31 January 2020. As a part of its transition from the EU Common Agricultural Policy (CAP), CAP-related support measures continued during 2021 while new domestic agricultural policy measures were phased in. Where new policy measures were announced, they focus on supporting sustainable agriculture, climate change resilience, improving the environment, animal health and welfare, and reducing greenhouse gas (GHG) emissions from the sector. Almost four-fifths of support to producers and about one-fifth of general services support relate to pre-existing CAP funded measures. Figures for 2021 show that new domestic support measures equate to about 3% of support to producers and three quarters of general services to the sector.

Producer support (PSE) is estimated at around 20% of gross farm receipts for 2019-21, and has remained fairly stable since 2017. Preliminary estimates show that the PSE increased in 2021 mainly due to an increase in Market Price Support (MPS) to 30% of farm support. This originates primarily from EU border measures during 2019-21. Almost half of farm support comes through payments decoupled from current production (Figure 28.3), while 12% relates to payments based on input use.

Support for general services (GSSE) is about 3% relative to the value of agricultural production during 2019-2021, below the OECD average. Expenditure on agricultural knowledge and innovation systems accounts for slightly over half of GSSE support and shows little change over the last five years. In addition, expenditures on inspection and control services to animals and crops sub-sectors account for almost one-third of GSSE, while expenditures on marketing and promotion of farm products account for about 12%. On average, total support to agriculture (TSE) represented about 0.3% of GDP during 2019-21, less than half of the OECD average.

Recent policy changes

Agricultural policy in the United Kingdom is devolved to the governments of Scotland, Wales and Northern Ireland. The UK Government has responsibility for England's agricultural policy.

In England, the Agriculture Act (2020) gave the government power to pay farmers for environmental improvements such as reducing carbon emissions. The government set out its plans for agricultural transition in late 2020 (Department for Environment, Food and Rural Affairs, 2020[1]), updated in 2021 (Department for Environment, Food and Rural Affairs, 2021[2]), from the EU's Common Agricultural Policy (CAP) to the development and phasing-in of new domestic schemes. These are being rolled out and piloted, and will replace the ongoing legacy CAP Pillar 1 and Pillar 2 subsidies and schemes.

More specifically, support to farmers in England will aim to improve the environment, animal health and welfare, and reduce carbon emissions, support resilience to climate change risks, and improve the productivity and sustainability of farm businesses. The new support measures' focus during the transition period is achieving specific targets and outcomes. For example, from 2021/22 to 2024/25, funding for

environment, animal health and welfare is projected to rise from 23% of support funding to 57%, while direct payments inherited from the CAP are projected to fall from 68% to 34%.

Moreover, changes in direct payments involve simplifications by removing greening and entitlement usage rules, and extending deadlines for farmers. In addition, direct payments will be delinked from 2024, and the requirement to farm the land will be dropped. As part of these measures, a "once-off" lump sum exit scheme from farming will be introduced.

In Scotland, the CAP schemes continued for 2021, but a new Scottish Agriculture Bill with a legal framework will be introduced in 2023 to replace the CAP. The Scottish Government published it Vision for Scottish Agriculture on 2 March 2022. Policies for Scottish agriculture's response to climate change were set out in the Net Zero Climate Change Plan 2018-2030. This Plan was further developed in 2021 (Scottish Government, 2021[3]) and outlines plans to transform support to farming and food production in Scotland, and to become a global leader in sustainable and regenerative agriculture. This commitment is part of a broader framework to underpin Scotland's future agriculture support regime from 2025 onwards.

Wales will introduce the Agriculture Bill to the Welsh Parliament (*Senedd)* in 2022, and set Sustainable Land Management as the framework for all future support for farming and enable the creation of the proposed Sustainable Farming Scheme. This scheme is anticipated to support famers to produce food in a sustainable way and take actions to support Welsh Government commitments around climate change and nature emergencies, and supports the Net Zero Wales Plan. Further information on the scheme will be published in summer 2022.

The EU Rural Development Programme 2014-20 will continue in Wales until 2023. A package of support for farmers, foresters, land managers and food businesses to support the resilience of the rural economy and natural environment was announced in April 2022 to support the transition to the Sustainable Farming Scheme.

In March 2021, Wales introduced regulations in the *Senedd* to commit to legally binding targets that deliver the goal of net-zero emissions by 2050. Alongside the net-zero target, Wales also updated its interim targets. The Net Zero Wales Plan (NZW) (Welsh Government, 2021[4]), launched on 28 October 2021, sets out the next steps along the path (2021 to 2025) to net-zero by 2050 and has a specific chapter on agriculture covering the full range of policies to mitigate GHG emissions in the sector. It describes how actions should contribute to net-zero, aiming at a greener, stronger and fairer agricultural sector.

In 2021, Northern Ireland initiated consultations on Future Policy Proposals for simplifications of support measures to farming during the transition. The Northern Ireland Assembly discussed new legislation to combat climate change, including defining specific targets to reduce GHG emissions. The various proposals on farming for carbon are included in the report "Consultation on Future Agricultural Policy Proposals for Northern Ireland" (Department for Agriculture, Environment and Rural Affairs, 2021[5]).

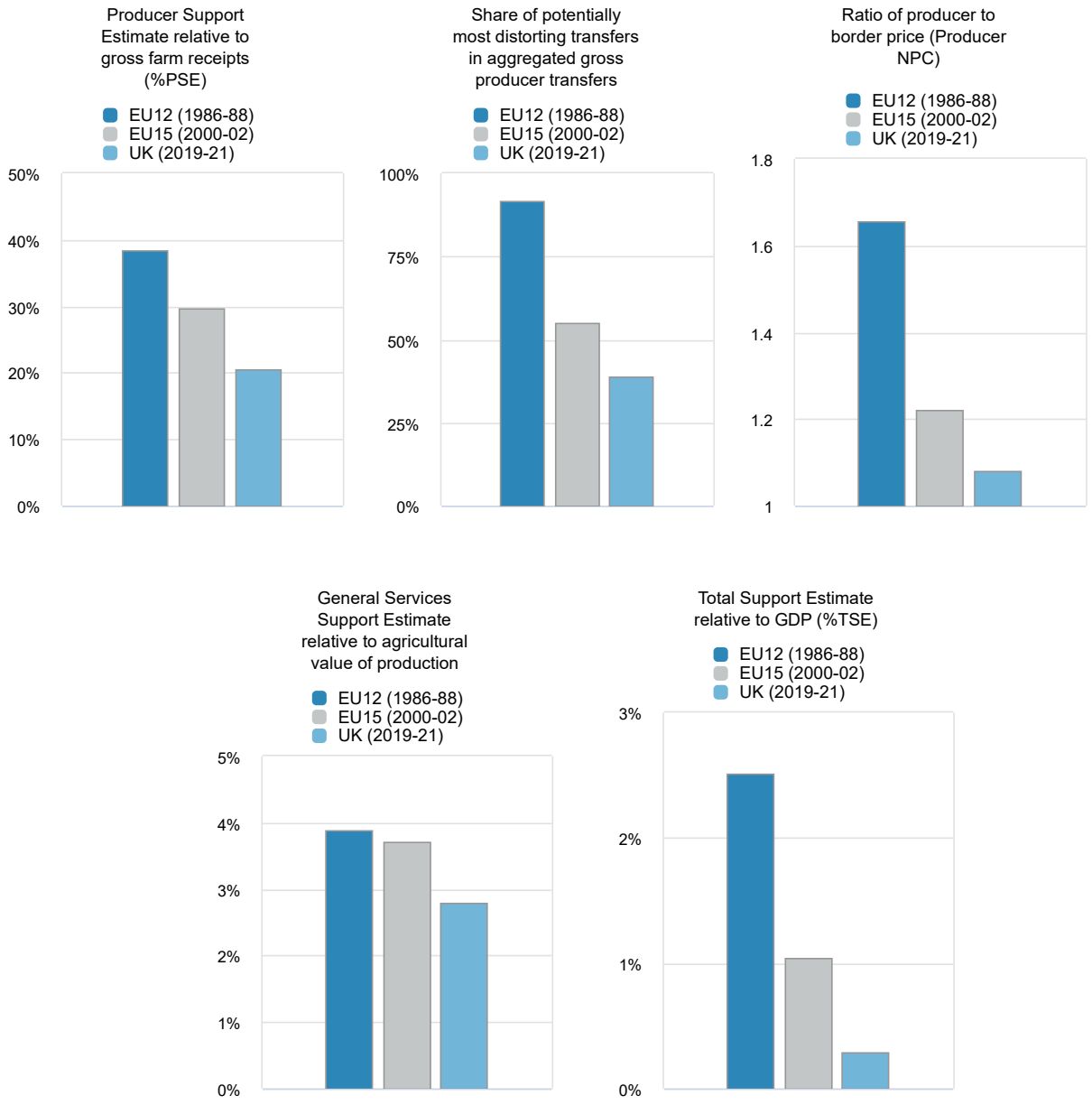
Assessment and recommendations

- UK agricultural policies' seven-year transition out of the Common Agricultural Policy to domestic policies began in 2021. The goal is for agriculture to contribute to the UK's Net Zero Strategy (GOV.UK, 2021[6]) with focus on sustainable and productive agriculture, payments for public goods, environment, animal and crop health, and disease control. As agriculture is devolved to the governments of England, Scotland, Wales and Northern Ireland, the pace of transition to domestic policies within the seven-year time frame varies in the countries.
- The role and contribution agriculture will make to achieve the commitments in the United Kingdom's Net Zero Strategy are ambitious. The Strategy includes a pathway for GHG emissions reduction for agriculture, forestry, and other land use (AFOLU). The pathway shows emissions would need to fall 17-30% relative to 2019 levels by 2030 and 24-40% by 2035. Detailed agricultural support

policies are being developed as a part of each of the four countries agricultural transition programme. The sector's contribution and progress towards meeting the UK's commitment of net-zero GHG emissions by 2050 will require the development of metrics with regular monitoring to ensure these contributions are kept under review and remain achievable for the sector in the long term.

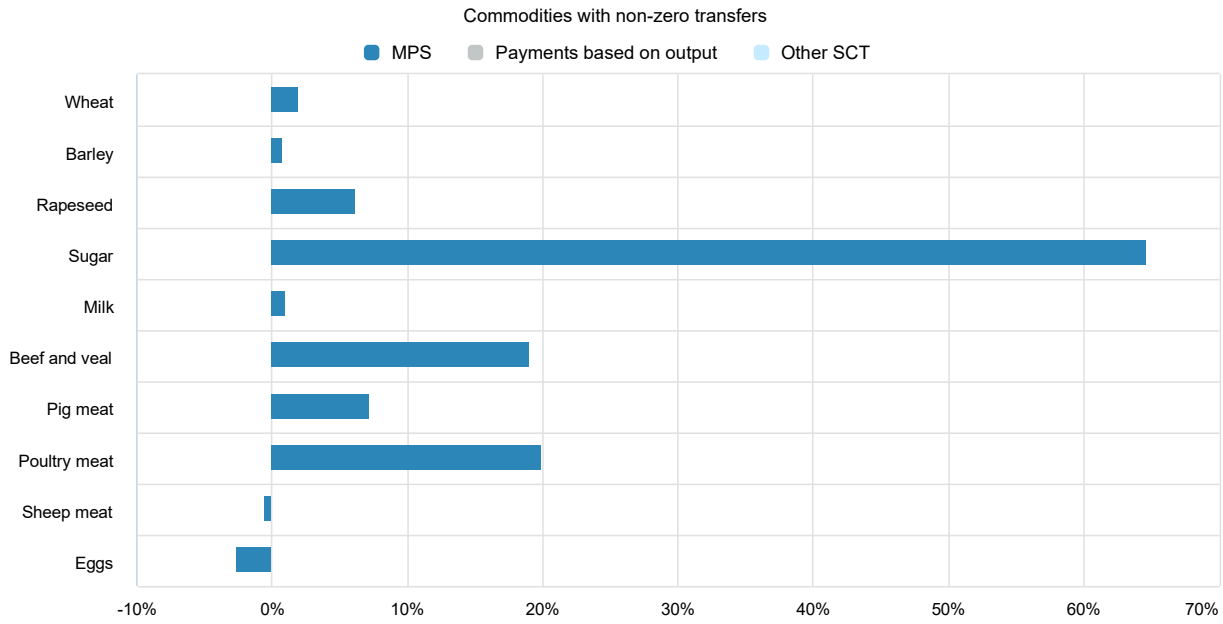
- Much of the short-term policy challenge revolves around simplification of existing schemes and support measures, and pilot testing new domestic policy measures to refine these prior to any large-scale rollout. Transition from existing CAP measures to new domestic schemes will create short-term complexity for the sector. An important challenge will be the right mix of policies to meet the stated objectives while improving policy coherence across the sector.
- A range of policies are being developed and introduced to achieve coherence with net-zero commitments while ensuring high productivity and sustainability in the sector. In addition to decoupled payments to agriculture, there is increasing emphasis on enhancing agricultural education and information systems to encourage the uptake of digital technologies.
- MPS, which increased somewhat in 2021, will need to be kept under review as agricultural transition programmes mature.
- The United Kingdom concluded numerous bilateral trade agreements in 2021 with a view to developing export markets for a range of agricultural and food products while strengthening domestic food security. Eight trade continuity agreements were signed since the last edition of this report, and three new trade agreements (Australia, New Zealand, and a combined Norway, Iceland and Liechtenstein agreement). These are far-reaching and ambitious, and likely to significantly impact agri-food products in the coming years. Monitoring and evaluation of these will be key to assessing impacts, including positive or negative unintended consequences.

Figure 28.1. United Kingdom: Development of support to agriculture



Note: Calculations for 2018-20 combine UK and EU-CAP elements.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 28.2. United Kingdom: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Note: Calculations combine UK and EU-CAP elements.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 28.1. United Kingdom: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	..	**31 305**	**31 101**	**30 037**	**32 776**
***of which:** share of MPS commodities (%)*	..	75.55	73.03	73.37	80.26
Total value of consumption (at farm gate)	..	**33 348**	**31 762**	**33 849**	**34 434**
Producer Support Estimate (PSE)	..	**7 513**	**6 937**	**6 662**	**8 940**
Support based on commodity output	..	2 271	1 848	1 490	3 476
Market Price Support[1]	..	2 271	1 848	1 490	3 476
Positive Market Price Support	..	2 312	1 872	1 490	3 573
Negative Market Price Support	..	-41	-25	0	-97
Payments based on output	..	0	0	0	0
Payments based on input use	..	817	811	823	816
Based on variable input use	..	608	585	612	625
with input constraints	..	0	0	0	0
Based on fixed capital formation	..	143	156	153	121
with input constraints	..	0	0	0	0
Based on on-farm services	..	66	70	58	70
with input constraints	..	0	0	0	0
Payments based on current A/An/R/I, production required	..	597	605	596	589
Based on Receipts / Income	..	0	0	0	0
Based on Area planted / Animal numbers	..	597	605	596	589
with input constraints	..	584	605	595	552
Payments based on non-current A/An/R/I, production required	..	5	0	0	16
Payments based on non-current A/An/R/I, production not required	..	3 600	3 466	3 501	3 832
With variable payment rates	..	0	0	0	0
with commodity exceptions	..	0	0	0	0
With fixed payment rates	..	3 600	3 466	3 501	3 832
with commodity exceptions	..	0	0	0	0
Payments based on non-commodity criteria	..	172	131	181	203
Based on long-term resource retirement	..	94	74	68	141
Based on a specific non-commodity output	..	77	57	113	63
Based on other non-commodity criteria	..	0	0	0	0
Miscellaneous payments	..	52	76	72	9
Percentage PSE (%)	..	**20.49**	**19.17**	**18.92**	**23.38**
Producer NPC (coeff.)	..	**1.08**	**1.07**	**1.05**	**1.13**
Producer NAC (coeff.)	..	**1.26**	**1.24**	**1.23**	**1.31**
General Services Support Estimate (GSSE)	..	**873**	**958**	**891**	**771**
Agricultural knowledge and innovation system	..	450	517	469	364
Inspection and control	..	275	271	274	281
Development and maintenance of infrastructure	..	40	38	40	42
Marketing and promotion	..	108	131	108	84
Cost of public stockholding	..	0	0	0	0
Miscellaneous	..	0	0	0	0
Percentage GSSE (% of TSE)	..	**10.47**	**12.12**	**11.76**	**7.94**
Consumer Support Estimate (CSE)	..	**-2 678**	**-2 004**	**-1 567**	**-4 463**
Transfers to producers from consumers	..	-2 335	-1 853	-1 479	-3 672
Other transfers from consumers	..	-411	-211	-111	-910
Transfers to consumers from taxpayers	..	10	4	24	2
Excess feed cost	..	58	56	0	117
Percentage CSE (%)	..	**-7.91**	**-6.31**	**-4.63**	**-12.96**
Consumer NPC (coeff.)	..	**1.09**	**1.07**	**1.05**	**1.15**
Consumer NAC (coeff.)	..	**1.09**	**1.07**	**1.05**	**1.15**
Total Support Estimate (TSE)	..	**8 396**	**7 898**	**7 577**	**9 713**
Transfers from consumers	..	2 745	2 064	1 590	4 582
Transfers from taxpayers	..	6 061	6 045	6 098	6 041
Budget revenues	..	-411	-211	-111	-910
Percentage TSE (% of GDP)	..	**0.28**	**0.27**	**0.27**	**0.30**
Total Budgetary Support Estimate (TBSE)	..	**6 125**	**6 051**	**6 087**	**6 237**
Percentage TBSE (% of GDP)	..	**0.21**	**0.21**	**0.22**	**0.20**
GDP deflator (1986-88=100)	..	**246**	**236**	**250**	**252**
Exchange rate (national currency per USD)	..	**0.76**	**0.78**	**0.78**	**0.73**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for the United Kingdom are: wheat, maize, barley, oats, rapeseed, sugar, milk, beef and veal, sheep meat, pig meat, poultry and eggs. The method for estimating MPS changes between 2020 and 2021. Market Price Differentials (MPD) for the United Kingdom are assumed equal to those of the European Union for the years until 2020, while they are calculated from UK domestic and reference prices from 2021.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

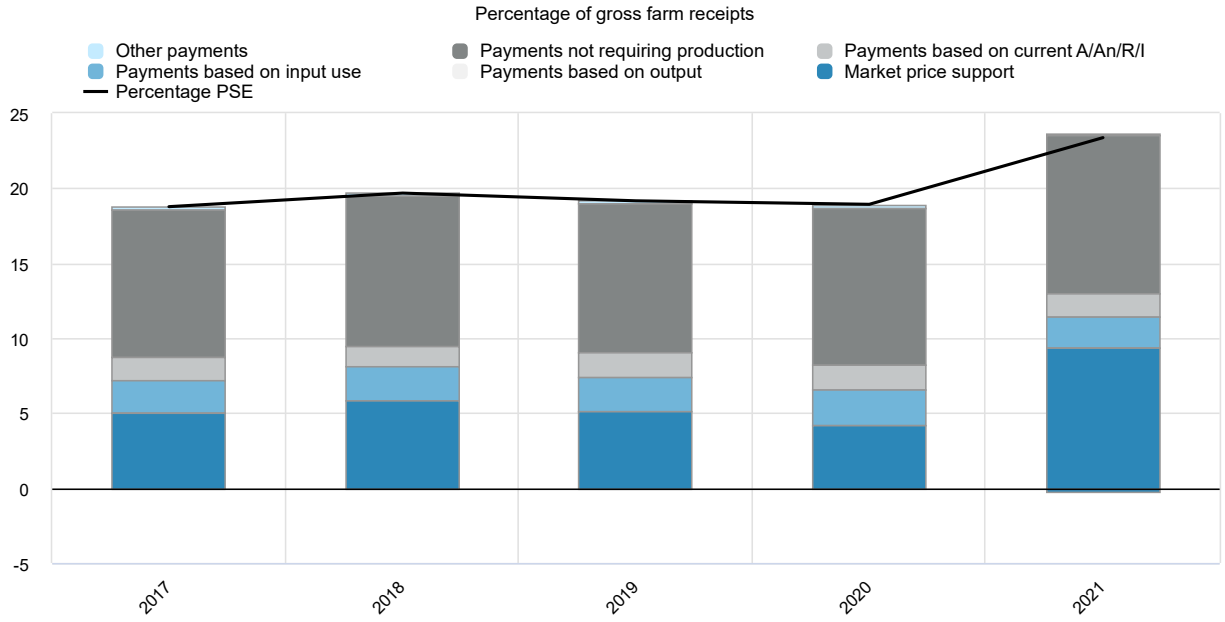
The United Kingdom joined the European Economic Community in 1973. Since then, its agricultural policies have been shaped by the reforms of the European Union Common Agricultural Policy.

The 2009 CAP Health Check allowed Member States to adopt a selection of measures under their Pillar 2. Subsequently, elective measures were also allowed under Pillar 1 of the CAP 2014-20, covering 2015 to 2023. The United Kingdom nations' choices of elective measures were generally aligned in this context, while specific payments were sometimes picked, such as the redistributive payment in Wales and voluntary coupled support in Scotland. The United Kingdom opted to transfer 10.8% of its broad-based direct payments envelope to targeted longer-term expenditure under Pillar 2.

The United Kingdom left the European Union on 31 January 2020. In 2021, after 40 years of implementing the Common Agricultural Policy (CAP) framework, new agricultural support systems were beginning to be made available to England, and the devolved governments of Scotland, Wales and Northern Ireland. While the overall policy framework, over the transition period, is similar across the four countries; nevertheless, the proposed timing and approaches to implementing the new policies vary substantially between the countries.

Agriculture is a devolved policy area under the Devolution Settlements for England, Scotland, Wales and Northern Ireland. Following the United Kingdom's departure from the European Union, Ministers of the UK Government, Scottish Government, Welsh Government, and Department of Agriculture, Environment and Rural Affairs in Northern Ireland agreed to develop a non-legislative framework for UK collaboration, co-ordination and co-operation on agricultural support. This would build upon commitments already developed between the Parties to work together at a UK level. However, since agriculture policy is devolved each nation retains the powers to create and implement specific countrywide legislation with regard to agriculture.

Figure 28.3. United Kingdom: Level and PSE composition by support categories, 2017 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The CAP defined support to agriculture in the United Kingdom until the transition out of the European Union in 2020. In 2020 there were extensive negotiations with the European Union over future trade and co-operation relations, the preparation and adoption of laws to govern agriculture in the United Kingdom after the withdrawal from the European Union, and bilateral trade liberalisation negotiations with third countries. The four devolved governments of the United Kingdom are at various stages with developing and implementing their agricultural transition plans. Alongside the phasing out of the CAP measures, all of the devolved governments are taking a co-development approach with the sector and stakeholders to design and deliver their new domestic policy instruments.

In 2020, under the CAP, UK agricultural support included GBP 2.7 billion (USD 3.7 billion) in direct payments through the Basic Payment Scheme (BPS). This was four times the agricultural support for environmental protection under the Rural Development Programme (RDP). Most of the payments inherited from the CAP will gradually be replaced by payments from the devolved governments and are targeted to improving agro-environmental performance.

England

In England, the government has set out plans for a seven-year agricultural transition to the new system which will pay farmers for environmental improvements on their land. Alongside the phasing out of CAP subsidies, market support measures and schemes, a range of environmental land management schemes have been introduced. These environmental land management schemes aim to positively affect numerous

outcomes relating to water quality, biodiversity, climate change adaptation and mitigation, air quality, natural flood management, coastal erosion risk mitigation and access and heritage. There are three environmental land management schemes under development, these are the Sustainable Farming Incentive, Local Nature Recovery, and Landscape Recovery Scheme.

Within these proposed reforms England is also heavily investing in research and development of agro-farming technology through the Farming Innovation Programme. Essentially, this programme aims to support ambitious R&D projects that will transform productivity, enhance environmental sustainability and net zero emissions, whilst adapting to a changing climate in the agricultural and horticultural sectors. A new "Farming Investment Fund" supports farmers' investments in more efficient production. The Future Farming Resilience Fund (launched in August 2021), will provide support to farmers to help them navigate changes during the agricultural transition period.

Scotland

In Scotland, the Agriculture (Retained EU Law and Data) (Scotland) Act 2020 enabled the continuation of CAP schemes beyond 2021, and allows Scotland to maintain policy stability and simplicity until 2025. However, the powers of the 2020 Act only enables limited simplifications and improvements to the operation of CAP legislation and precludes substantive changes until a new Scottish Agriculture Bill is introduced. A new Scottish Agriculture Bill is expected to be brought forward in 2023 to replace the CAP with a legal framework to support the future Scottish vision for agriculture.

Scotland is taking a co-development approach, working with stakeholders to secure increased uptake of low emission farming measures through new schemes and technologies, and the development of environmental conditionality and enhanced advisory support. The landscape policies and practices are expected to further evolve in response to climate change with increasing support to woodlands, the restoration of peatlands, and land for growing biomass.

Wales

The new Agriculture Bill in Wales sets out the most important policy changes the agricultural sector has seen in decades, with the main goal of reducing the food systems overall carbon footprint. The Agriculture Bill sets Sustainable Land Management as the overarching framework for future support in agriculture and will enable the creation of future support schemes. This Bill is expected to be introduced to the *Senedd* in 2022.

The Welsh Government's "All Wales Plan: Working Together to Reach Net Zero", shows some examples of industry-led initiatives in decarbonising agriculture. The farming industry is driving these changes to a decarbonised future with the NFU pledging to reach net zero by 2040.

Northern Ireland

In Northern Ireland, the Future Agricultural Policy Framework Portfolio was launched in August 2021. The Framework sets out the direction of future agricultural policy across the following four key areas; increased productivity, environmental sustainability, improved resilience, and an effective functioning supply chain. The Department of Agriculture, Environment and Rural Affairs (DAERA) published a Consultation on the Future Agricultural Policy Proposals in December 2021. Responses to the consultation were considered and the Minister has announced 54 decisions that will contribute to the design of new domestic agricultural policy and targeted support.

Climate change mitigation policies in agriculture

The Net Zero Strategy sets-out an ambitious path to meet the Sixth Carbon Budget and Nationally Determined Contribution, cutting emissions by at least 68% by 2030 on1990 levels, and reaching net zero by 2050. The Sixth Carbon Budget (Climate Change Committee, 2020[7]) states that the UK's agricultural emissions were 54.6 $MtCO_2eq$ in 2018. This represents 10% of GHG emissions in 2018 compared to 7% in 1990. In 2019, the United Kingdom became the first major economy to legislate a binding target to reach net-zero emissions by 2050. In 2021, the "Net Zero Strategy" (GOV.UK, 2021[6]) set out a pathway to reach the net-zero target, including sector-by-sector goals. Within this, agriculture was considered part of the larger group of sectors referred to as AFOLU, where emissions may need to fall 17-30% relative to 2019 levels by 2030, and 24-40% by 2035. Across the United Kingdom, responsibility to reduce GHG emissions in agriculture is devolved, with each country free to develop its own strategy to reach the target. Scotland and Wales both released separate Net Zero Strategies that detail how they will contribute to the UK's Net Zero target.

England

The government published a target to decarbonise agricultural emissions by up to 6 $MtCO_2eq$ per annum in its Sixth Carbon Budget (2033-37) (Climate Change Committee, 2020[7]). It is anticipated that this target will be met through the collective actions under new environmental land management schemes, together with the Farming Innovation Fund, which will fund the deployment of new technologies, and other farming offers, such as the Farming in Protected Landscapes scheme published in July 2021.

In addition to benefitting wildlife and the environment, the new environmental land management schemes will play a crucial role in climate change mitigation, reducing GHG emissions and increasing carbon storage. England began to pilot these schemes. For example, the Local Nature Recovery and Landscape Recovery schemes will make carbon savings through peatland management/restoration and tree planting.

Policy measures and updates announced in 2021 to contribute to climate change mitigation in England include the Biomass Policy Statement (published in November 2021), the Peat Action Plan (published in May 2021), and the England Trees Action Plan (published in May 2021).

Wales

Net Zero Wales Carbon Budget 2 (Welsh Government, 2021[4]) sets out a pathway to deliver net-zero emissions across Wales by 2050. The Carbon Budget sets out current and proposed mitigation policy across two areas: (1) low-carbon farming practices (increasing on-farm measures that reduce emissions from soils, e.g. grass leys and cover crops), livestock (e.g. animal diets, health and breeding), and waste and manure management; and (2) measures to release land from farming. Wales will consider options for converting some of agricultural land to woodland, shifting some agricultural land to biofuel production, and the restoration and sustainable management of peatland alongside greater support to the horticulture sector. The Agriculture Bill sets Sustainable Land Management as the overarching framework for future support in agriculture and will enable the creation of future support schemes. This Bill is expected to be introduced to the *Senedd* in 2022.

Total emissions from the agricultural sector in Wales declined by 10% from 1990 (the base year) and 2019. This was driven by decline in livestock numbers and nitrogen fertiliser use. In 2019, Welsh agriculture emissions increased 2% compared to 2018. This is attributed to an increase in sheep numbers (enteric fermentation, 2.9%), and liming activities (49%), which display high year-to-year variability.

Scotland

Scotland's Climate Change Plan update 2020 (Scottish Government, 2021[3]) sets out six outcomes and indicators for how agricultural will contribute to reaching net-zero emissions of GHGs by 2045. For each outcome, the plan sets out policy instruments being maintained or boosted alongside instruments under development as a part of the agricultural transformation programme started in 2020.

The six outcomes set out in the Climate Change Plan are:

1. A more productive, sustainable agricultural sector that significantly contributes to delivering Scotland's climate change and wider environmental outcomes through increased uptake of climate mitigation measures by farmers, crofters,[1] land managers and other primary food producers.
2. More farmers, crofters, land managers and other primary food producers who aware of the benefits and practicalities of cost-effective climate mitigation measures.
3. Lower nitrogen emissions, including from nitrogen fertiliser, through a combination of improved understanding, efficiencies and improved soil condition.
4. Reduced emissions from red meat and dairy through improved emissions intensity.
5. Reduced emissions from the use and storage of manure and slurry.
6. Increased and maintained carbon sink through carbon sequestration and existing carbon stores on agricultural land.

The Climate Change Plan update highlights policy delivery developments. The Farm Advisory Service and Farming for a Better Climate increased the uptake and provision of advice and support. A range of research and knowledge-transfer projects were undertaken to inform low-carbon farming and develop an understanding of low-carbon technologies and the opportunities for Scotland. The agricultural sector is supported to improve efficiencies and reduce emissions (e.g. piloting the Sustainable Agricultural Capital Grant Scheme). Building on the work by farmers and crofters to reduce emissions, peer-to-peer support through Climate Change Champions and Monitor Farms was provided. The Forestry Grant Scheme and local forestry advisory initiatives each year see over 200 farmers and crofters creating new farm woodlands and diversifying their farming businesses to include forestry.

Northern Ireland

In March 2022, the Northern Ireland Assembly passed amendments to the Climate Change Bill. The Climate Change Bill completed its Final Stage on 9 March 2022, and is expected to receive Royal Assent 6-8 weeks from this date and become The Climate Change Act (Northern Ireland) 2022.

In Northern Ireland, "carbon/GHG reduction" is a cross cutting theme within the Future Agricultural Policy Framework Portfolio (published in August 2021). This theme seeks to ensure that policy interventions reduce the carbon footprint of the agricultural industry. Proposed policy measures relate to reduction in agricultural GHG emissions (e.g. measures to support enteric methane reducing feed additives and encouraging different practices in relation to timing of fertiliser and slurry spreading), carbon storage (e.g. measures to support soil carbon sequestration and rewetting peatlands) and bioenergy feedstocks production.

Other policy streams will complement the Carbon Reduction programme, as outlined below:

1. A Farming Sustainability Payment to participate in soil testing and the Soil Nutrient Health Scheme, which assesses soil carbon and carbon in farm hedges and trees.
2. The Farming for Nature Package will focus initially on habitat and biodiversity, and is projected to increase carbon sequestration management practices.
3. Knowledge and innovation measures in education, training and knowledge-exchange to improve productivity, environmental performance and sustainability.

4. Generational Renewal to bring younger farmers into farm businesses, intended to drive the adoption of new and innovative agricultural technologies.
5. The Ruminant Genetics Programme to produce information and genetic evaluations to improve livestock productivity, health and welfare, and reduce GHG emissions.

The Carbon Reduction programme in Northern Ireland is supported by smaller schemes to drive the net-zero ambition. To complement this, the Forests for Our Future Programme launched in 2020 aims to plant 9 000 hectares of woodland by 2030. The Small Woodland Grant Scheme provides aid for woodland planting for areas between 0.2 and 5.0 hectares, with an establishment grant and annual premia.

Domestic policy developments in 2021-22

England

In 2021, under the Agriculture Act 2020, the application period opened for the first round of the Farming Investment Fund. In February 2022, the government announced the introduction of a Lump Sum Exit Scheme for farmers who wish to leave the industry. This scheme is due to open for applications in April 2022 and will run until the end of September 2022. Payments will be based on the average direct payments made to the farmer for the 2019-2021 Basic Payment Scheme years.

In July 2021, applications for the pilot for the first of England's new environmental land management schemes were announced with agreements commencing from November 2021. The "Sustainable Farming Incentive" is designed to support farmers that generate significant environmental and climate benefits, and animal health and welfare outcomes, alongside food production. The overall target in England is to have 70% of farmland covered by this scheme, including farmers who are not currently in an agro-environment scheme. Since 2020, Defra has been publishing regular evidence reports on tests and trials (Department for Environment, Food and Rural Affairs, 2021[8]) that showed key findings from the tests and trials on the environmental land management schemes. These reports provide insight into what has been learned from the tests and trials and how the evidence is being used to inform policy decisions for scheme design and delivery.

By the close of 2021, the number of applications for England's Countryside Stewardship (CS), which aims at protecting biodiversity and delivering environmental outcomes, had increased by 40% compared to 2020. In the future, England is looking for the new Local Nature Recovery scheme to be the improved and more ambitious successor to Countryside Stewardship.

In early 2022, the application process opened for pilot projects for the first round of the Landscape Recovery Scheme. This scheme is open to any individuals or groups of land owners or managers who want to come together to deliver large (500–5 000 hectares) scale projects. The first round of projects will be focused on two themes (a second round will commence in late 2022):

- Recovering and restoring England's threatened native species, e.g. through recovery of priority habitats and habitat quality.
- Restoring England's streams and rivers: improving water quality, biodiversity and adapting to climate change, e.g. through restoring water bodies, rivers, and floodplains to a more natural state.

In 2021, the Environment Act 2021[2] became law. This legislation primarily used powers from the Environment Act 2021[3] to create the Office for Environmental Protection which protects and improves the environment by holding government and public authorities to account. The various sections of this legislation provide a framework for environmental targets to be set for specified priority areas, fine particulate matter in ambient air, and species abundance as well as creating legislation which requires the Secretary of State to obtain and publish data for monitoring environmental improvement.

In February 2022, the UK Government published the Levelling Up White Paper (GOV.UK, 2022[9]), which sets out how the government intends to spread opportunity more equally across the United Kingdom. The White Paper sets out medium term levelling up "missions" around boosting productivity, pay, jobs and living standards, digital connectivity (GBP 1 billion – USD 1.4 billion) Shared Rural Network deal with mobile operators delivering 4G coverage to 95% of the United Kingdom by the end of 2025), improving public services in areas where weakest, restoring a sense of community and empowering local leaders and communities. Businesses, households and individuals are all expected to benefit from improved digital connectivity.

Scotland

At the beginning of 2022, Scotland announced the National Test Programme (NTP) which will be phased in during 2022, with funding of up to GBP 51 million (USD 69 million) over a period of three years. The NTP is aimed at supporting and encouraging farmers and crofters to learn about how their work impacts climate and nature, including financial support to carry out carbon audits and nutrient management plans. The NTP will also work with focus groups of farmers and crofters to develop techniques to support sustainable farming.

Wales

In Wales, the Agriculture (Wales) White paper, published in December 2020, sets out the Welsh Government's intentions to introduce an Agriculture (Wales) Bill in the sixth session of the *Senedd* (period 2021-26). The new Agriculture Bill in Wales sets out the most important policy changes the agricultural sector has seen in decades, with the main goal of reducing the food systems overall carbon footprint. The Agriculture Bill sets Sustainable Land Management as the overarching framework for future support in agriculture and will enable the creation of future support schemes. This Bill is expected to be introduced to the *Senedd* in 2022.

Northern Ireland

In Northern Ireland, the DAERA launched the Future Agricultural Policy Framework Portfolio for Northern Ireland (Department of Agriculture, Environment and Rural Affairs, 2021[10]) on 24 August 2021. The DAERA introduced legislation to give legal effect to several simplifications to the rules governing the direct agricultural support schemes for the 2021 schemes year. These simplifications include: the removal of the Greening requirements for the 2021 scheme year and incorporating the Greening Payments into the BPS entitlement unit values; continuing the ban on ploughing or conversion of Environmentally Sensitive Permanent Grassland; limiting the number of entitlements that can be allocated from the Regional Reserve to 90 for each application; limiting the number of times an applicant can submit an application for the Young Farmer's Payment; and setting the inspection rate for the Basic Payment Scheme at 1%.

On 6 January 2022, DAERA introduced further legislation to give legal effect to additional simplifications which build on the earlier simplifications introduced in 2021. The central focus of DAERA's agricultural measures are to develop a tailored support regime that will help farmers to become more productive and to maximise sustainable returns on their farms.

Domestic policy responses to the COVID-19 pandemic

In response to market pressures caused by the economic impact of COVID-19, England announced a package of support for the pig sector. This included the funding of a private storage aid scheme which enabled meat processors to store slaughtered meat for 3-6 months. Until 31 December 2021, the Seasonal Workers Pilot Scheme facilitated temporary visas for pig butchers to travel and work in England, helping to support the sector.

Trade policy developments in 2021-22

The EU-UK Trade and Cooperation Agreement was applied provisionally as of 1 January 2021 and entered into force on 1 May 2021. Throughout 2021, a number of specialised committees established under the Agreement met, including the Trade Partnership Committee and the Trade Specialised Committees on Goods; Custom Cooperation and Rules of Origin; Technical Barriers to Trade; and Sanitary and Phytosanitary Measures.

From 1 January 2021, the trade agreements that the United Kingdom was party to as a Member State of the European Union no longer applied. However, the United Kingdom has sought to maintain these trading agreements with rollover deals negotiated with third countries to ensure the continuity of trade.

In addition to the agreements secured in 2019 and 2020 providing continuity for trade (Department for International Trade, 2020[11]), in 2021 the United Kingdom signed trade continuity agreements with Mexico, Turkey, Moldova, Viet Nam, Albania, Cameroon, Ghana and Serbia. In July 2021, the United Kingdom signed a Free Trade Agreement (FTA) with Norway, Iceland and Liechtenstein, further developing trading relationships which the United Kingdom had when part of the European Union and placing them onto a solely UK footing. This was followed by two new FTAs, with Australia in December 2021, and New Zealand in February 2022.

The UK Government's Impact Assessments (Department for International Trade, 2021[12]; Department for International Trade, 2022[13]; Department for International Trade, 2021[14]) of the FTAs shows the following for the agricultural sector:

- The Norway, Iceland and Liechtenstein agreement creates new opportunities for UK meat exporters (pork meats, sausages, and poultry) to export duty-free to Norway through duty-free quotas. For the dairy sector the agreement reduces tariffs for exporters to Norway of specific UK hard cheeses. The agreement also maintains a duty free quota for all cheeses and allows improved duty-free market access through a new duty-free quota for the UK export of eggs to Norway.
- Modelling of the impact of the FTAs between the United Kingdom, Australia and New Zealand suggests the potential for an increase in competition for some agricultural products, notably cattle and sheep meat (beef/lamb). It concludes that the potential and scale of any long run increase in imports are uncertain. Increased imports of these products could bring benefits for consumers across the whole of the United Kingdom via lower prices and increased choice. However, there is a risk that any adjustment costs which arise are borne by import-competing producers and in localities where production is concentrated.
- Under the Australia and New Zealand FTAs tariff liberalisation for sensitive goods will be phased in over time. The United Kingdom's most sensitive products such as beef and sheep meat will be subject to measures including tariff rate quotas (TRQs) and product specific safeguards. These measures will limit the volume of duty-free imports permitted and in the case of beef and sheep meat will be in place for 15 years. An additional general bilateral safeguard mechanism will also be in place for all products, providing a temporary safety net for domestic producers if they face serious injury, or the threat of serious injury, from increased imports as a direct consequence of the FTAs. This protection will last for a product's tariff liberalisation period plus five years in order to allow domestic producers time for readjustment. This means a total of 20 years of protection for sheep meat (15-year TRQ plus 5 years of extra bilateral safeguards) for New Zealand.
- The United Kingdom's FTAs with Australia and New Zealand cover non-regression and non-derogation clauses for animal welfare. This will help ensure that neither country lowers their animal welfare requirements in a manner which impacts trade.

In October 2021, the UK Government announced the launch of a new United Kingdom Trade and Agriculture Commission (TAC) (GOV.UK, 2021[15]). This was part of the United Kingdom's response to the previous recommendation from the pre-existing United Kingdom Trade and Agriculture Commission report

published in March 2021 (GOV.UK, 2021[16]). The new TAC's role is to provide scrutiny of new trade deals once they reach the signature stage, helping to ensure compliance with the new domestic high-quality agricultural standards.

The TAC will prepare independent advice on FTAs and matters covered by Section 42 of the Agriculture Act, excepting human health. Advice from the TAC will therefore inform the government's reports on standards in FTAs as required under Section 42 of the Agriculture Act. In addition, the TAC's advice and advice from the Food Standards Agency and Foods Standards Scotland on human health, will be published alongside each Section 42 report. This independent advice will inform Parliamentarians as they scrutinise an FTA in advance of ratification, under the Constitutional Reform and Governance Act (CRaG).

In November 2021, the UK Government announced eight new agri-food and drink attachés (GOV.UK, 2021[17]) to areas identified as priority export markets, as part of a wider plan to boost exports, unlock barriers to trade, and open up new exporting opportunities. Attachés are based in UK Embassies and High Commissions overseas.

Contextual information

Economic growth, as measured by GDP, has remained steady at 2%-4% in the United Kingdom over the last 20 years, with the exception of the financial crisis in 2008 and 2009, and the COVID-19 pandemic which started in 2020. In 2008, economic activity fell by about 5%, but rebounded during the following years to reach its long-term trend rate. However, in 2020 the combination of different health measures to contain the spread of the COVID-19 had a major impact on the UK economy, and GDP fell by about 10%. In 2021, with the easing of the restrictive health measures, and driven by a high level of pent-up consumer demand, the economy rebounded and GDP grew by 7%.

The rate of unemployment has fluctuated around 5% since 2000, and increased to more than 8% after the financial crisis for a number of years before dropping to the long term trend rate of about 5% in 2013. However, with the onset of the pandemic in 2020, the unemployment rate increased before dropping in 2021 as economic activity recovered. The rate of inflation in the United Kingdom has fluctuated within a narrow range up to 4% over the last 20 years.

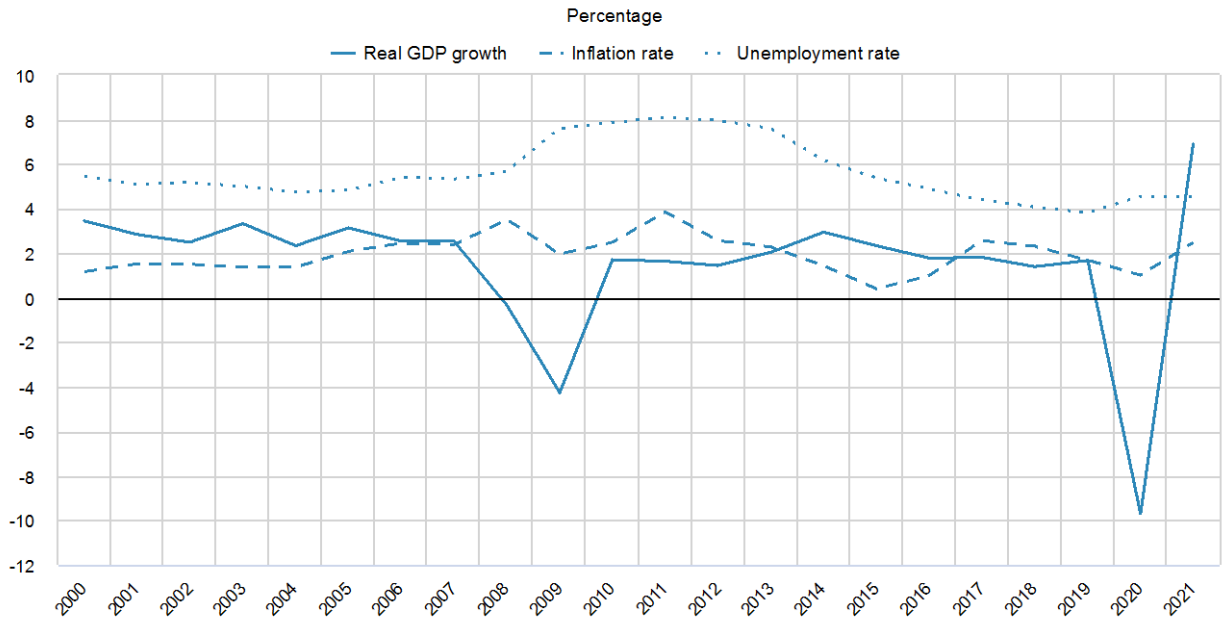
The agricultural sector is relatively small in the United Kingdom and accounts for less than 1% of GDP and total employment, which is significantly less than the OECD average. The share of livestock in total agricultural production has increased to 63%, while the share of crops has fallen to 37%. Over the last two decades, the share of agro-food exports and imports in total exports and imports has risen, with exports now exceeding 7%, and imports at about 10% of the total (Table 28.3).

Table 28.2. United Kingdom: Contextual indicators

	United Kingdom		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	1 560	3 082	3.9%	2.8%
Population (million)	59	67	1.4%	1.3%
Land area (thousand km²)	242	242	0.3%	0.3%
Agricultural area (AA) (thousand ha)	16 964	17 521	0.6%	0.6%
			All countries[1]	
Population density (inhabitants/km²)	244	281	53	63
GDP per capita (USD in PPPs)	26 487	45 944	9 281	20 929
Trade as % of GDP	20	18	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	0.9	0.6	2.9	4.9
Agriculture share in employment (%)	1.5	1.0	-	-
Agro-food exports (% of total exports)	5.2	7.4	6.2	8.5
Agro-food imports (% of total imports)	7.8	10.1	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	41	37	-	-
Livestock in total agricultural production (%)	59	63	-	-
Share of arable land in AA (%)	35	35	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Figure 28.4. United Kingdom: Main economic indicators, 2000 to 2021

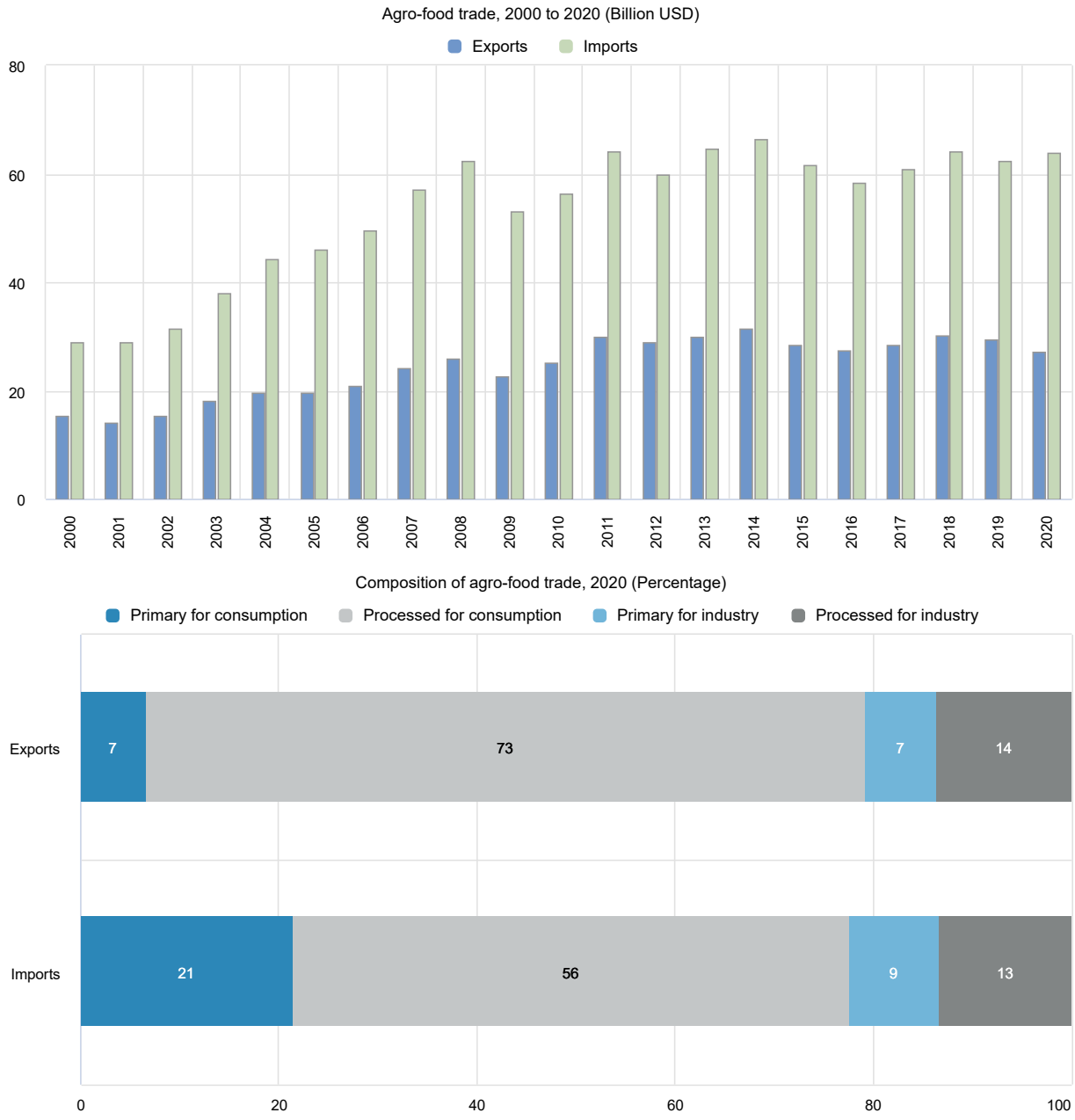


Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Overall the United Kingdom is a net importer of agricultural goods. The value of agricultural trade has remained remarkably stable over the last 20 years as shown in Figure 28.5. The value of agro-food exports

in 2020 from the United Kingdom to the rest of the world amounted to USD 27 billion, while the value of agro-food imports were more than double, at over USD 64 billion. The composition of agro-food trade in 2020 shows that the majority (73%) of exports are goods processed for consumption, whereas 14% of goods exported are processed for industry. In terms of imports, the majority (56%) are goods processed for consumption, followed by primary goods for consumption which account for 21% of imports.

Figure 28.5. United Kingdom: Agro-food trade

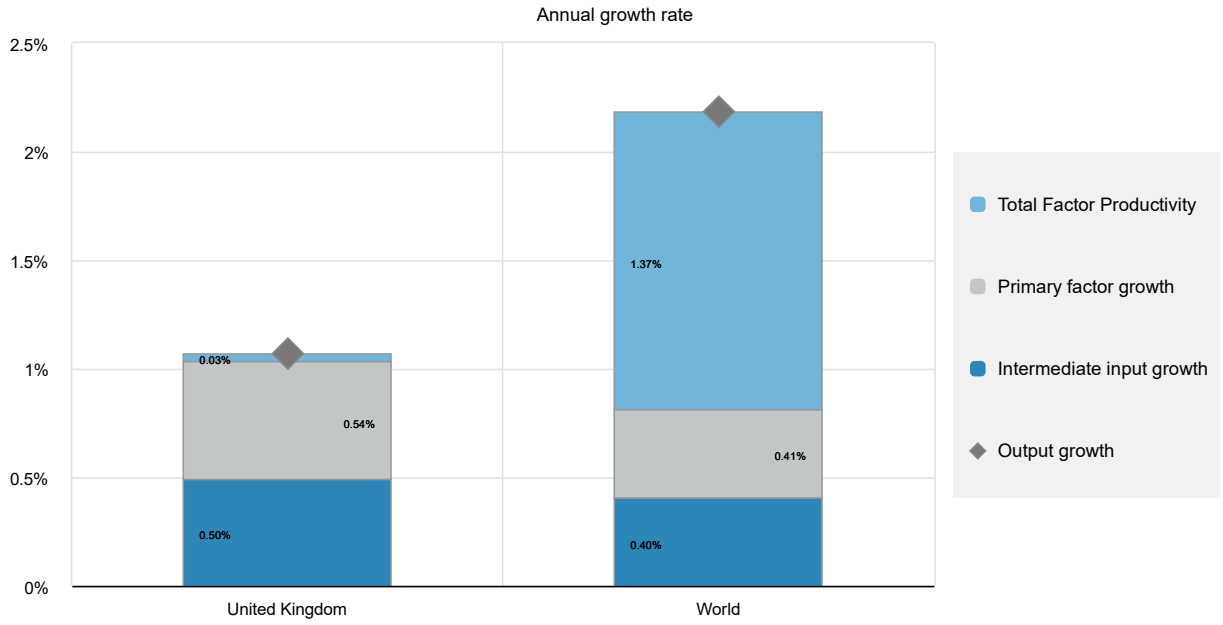


Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Over the period 2010-19, the output growth for the United Kingdom was 1%, less than half of the global average (Figure 28.6). Total factor productivity (TFP) growth over the last decade has been close to zero, and production growth was entirely driven by increased use of both primary factors and intermediate inputs.

Environmental indicators point to improvements from 2000 to 2020. The nitrogen balance fell by around 20%, the phosphorous balance declined by about 40%, and the share of agriculture in water abstractions fell by 19% as the agricultural irrigated area was halved. At the same time, the sector's share in the country's energy use increased by 20% and the share of its GHG emissions grew by just over 40% (Table 28.4). Total GHG emissions from the agricultural sector equate to about one-tenth of the total GHG emissions in the United Kingdom.

Figure 28.6. United Kingdom: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land, livestock and machinery. Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 28.3. United Kingdom: Productivity and environmental indicators

	United Kingdom		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	0.3%	0.0%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	107.0	86.0	32.1	30.0
Phosphorus balance, kg/ha	10.0	6.0	3.4	2.9
Agriculture share of total energy use (%)	0.8	1.0	1.7	2.0
Agriculture share of GHG emissions (%)	6.4	9.3	8.6	9.7
Share of irrigated land in AA (%)	0.8	0.4	-	-
Share of agriculture in water abstractions (%)	17.5	14.2	46.3	43.7
Water stress indicator	0.0	4.3	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] A person who rents and works a small farm, especially in Scotland or northern England.

[2] The Environment Act 2021 (Commencement No. 1) Regulations 2021 which came into force on 17 November 2021.

[3] The Environment Act 2021 (Commencement No. 2 and Saving Provision) Regulations 2022 was established on 17 January 2022.

29 United States

Support to agriculture

Support to agricultural producers in the United States is below the OECD average. Producer support averaged 11% of gross receipts in 2019-21, well below the 20% measured in the mid-1980s and early 2000s, but higher than a decade ago. The share of potentially most-distorting transfers was 25% in 2019-21, also below the OECD average and half of its peak values. Prices received by farmers in 2019-21 were 3% higher on average than in world markets, whereas they had been 11% higher in 2000-02. This gap is due to market price support (MPS) from border protections (including tariff rate quotas) for sugar, sheep meat, and milk. Producer prices of most other commodities align with border prices.

While MPS has declined, budgetary support has increased over time, covering mainly risk management, crop insurance and, more recently, compensation for the effects of the COVID-19 pandemic. The counter-cyclical nature of budgetary support links it to market price developments, such that periods of high commodity prices, as in 2012-13, typically see lower levels of support.

US domestic food assistance programmes that support consumers account for nearly half of total support to US agriculture. Expenditures for general services (GSSE) were equivalent to 2.6% of the value of production in 2019-21, and total support to agriculture was 0.5% of GDP in 2019-2021.

Recent policy changes

Several programmes with broad conservation objectives received updates to increase their climate benefits. For example, there is a new Climate-Smart Practice Incentive for the general and continuous Conservation Reserve Program (CRP) signups. A pilot programme under the Environmental Quality Improvement Program (EQIP) supports climate-smart agriculture and forestry through the adoption of targeted conservation practices.

The USDA is drafting recommendations for a climate-smart agriculture and forestry (CSAF) strategy, and recently issued a progress report containing seven recommended elements, including quantifying and tracking outcomes, leveraging existing programmes, more education and training, support for market development of climate-smart products, and increased research.

Several initiatives were launched in 2021 to ensure more equitable access to USDA programming for historically underserved populations. These include risk management education, outreach, and targeted technical assistance to connect underserved producers with USDA programmes and services.

Several ad hoc programmes were established to reduce the impact of market disruptions related to the pandemic and supply-chain problems. This includes compensation for reduced processing capacity for pork and poultry, and targeted voluntary programmes to encourage donations of surplus dairy production to feeding programmes.

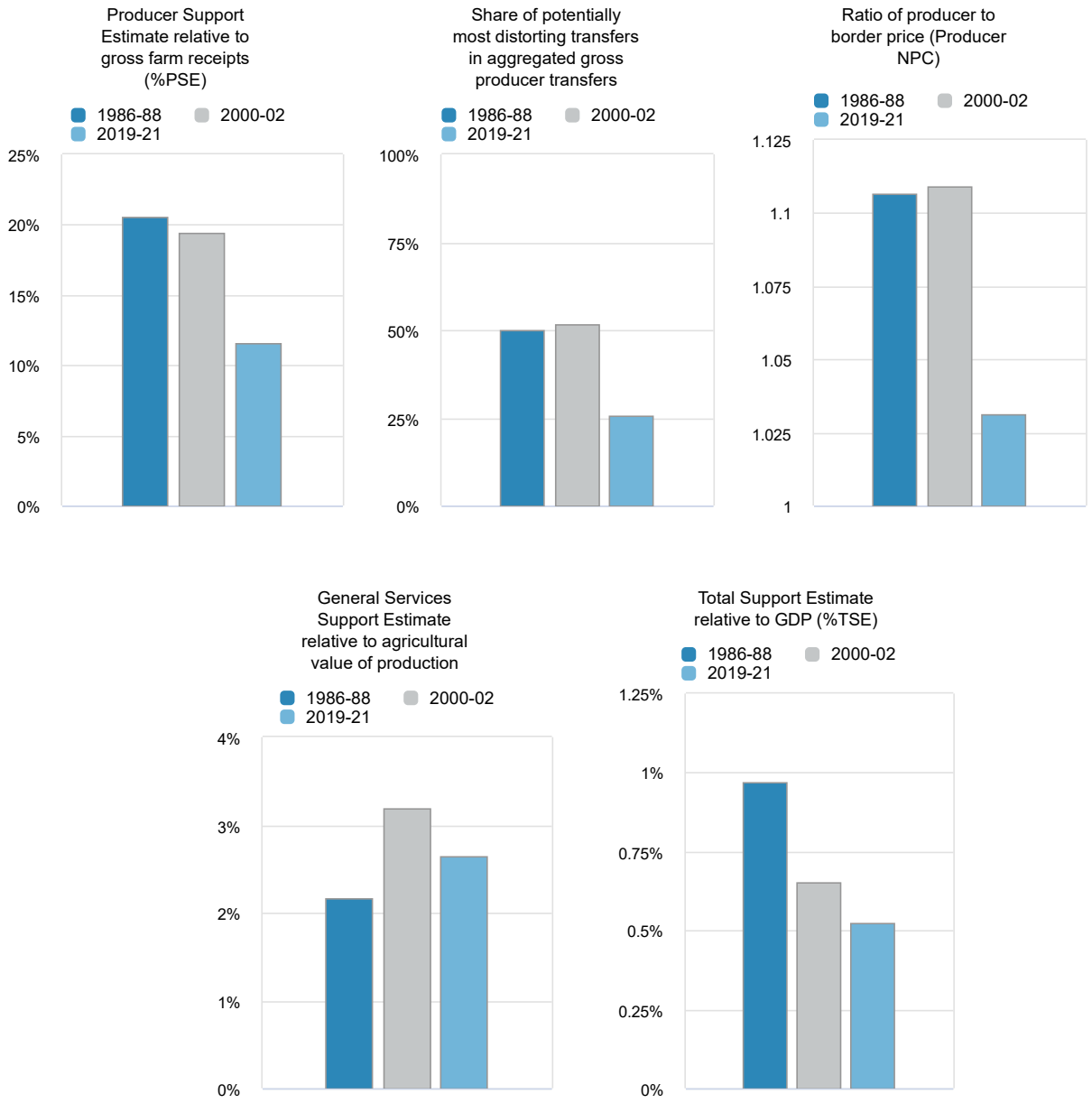
Several changes to existing disaster assistance programmes launched in 2021. A new Quality Loss Adjustment (QLA) programme launched under the Wildfire and Hurricane Indemnity Program Plus

(WHIP+). The Emergency Assistance for Livestock, Honey Bees and Farm-Raised Fish Program (ELAP) now also covers feed transportation costs for drought-impacted ranches.

Assessment and recommendations

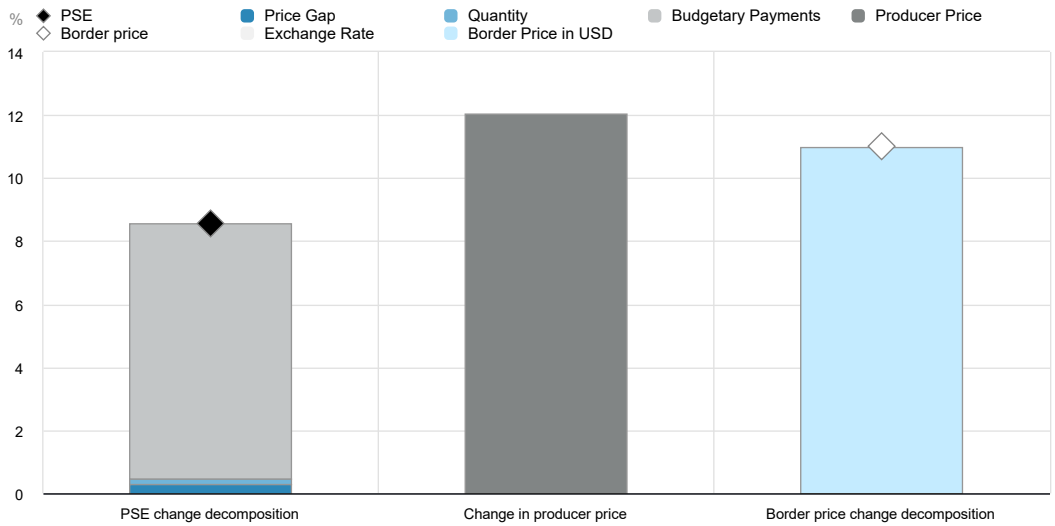
- Nitrous oxide emissions from soils are the largest source of agricultural greenhouse gas (GHG) emissions in the United States. Efforts to encourage better practices for nitrogen fertiliser application and reduce nutrient surpluses could be reinforced through a combination of targeted regulation and voluntary incentives to reduce GHG emissions and improve water quality.
- Ruminant meat and dairy products have the largest carbon footprint among food products. The United States is party to the Global Methane Pledge to reduce methane emissions. The United States should clarify its plans as part of this pledge for agricultural methane emissions reductions and continue to encourage farmers and ranchers to adopt new practices that will reduce GHG emissions and improve GHG efficiency in the agricultural sector.
- Market disruptions connected to the COVID-19 pandemic provide an opportunity to build long-term strategies for resilience and move away from ad hoc crisis recovery programmes. One way is to connect recovery payments to investments in adaptation. This would enhance resilience both to market shocks and to climate change, as more frequent extreme weather events unfold.
- The US agricultural sector is modern, well-capitalised and efficient. It is unclear that there is a need to continue historical reliance on support linked to prices for income stabilisation, which presumes limited resilience to normal market movements and discourages investment in preparedness.
- The new commitment to respond better to the needs of traditionally underserved communities is a welcome development and should be continued. In addition to addressing equity concerns, this could build sector diversity and resilience. Better quantification and reporting on inequities related to the environmental and health hazards associated with agriculture production and processing would help.

Figure 29.1. United States: Development of support to agriculture



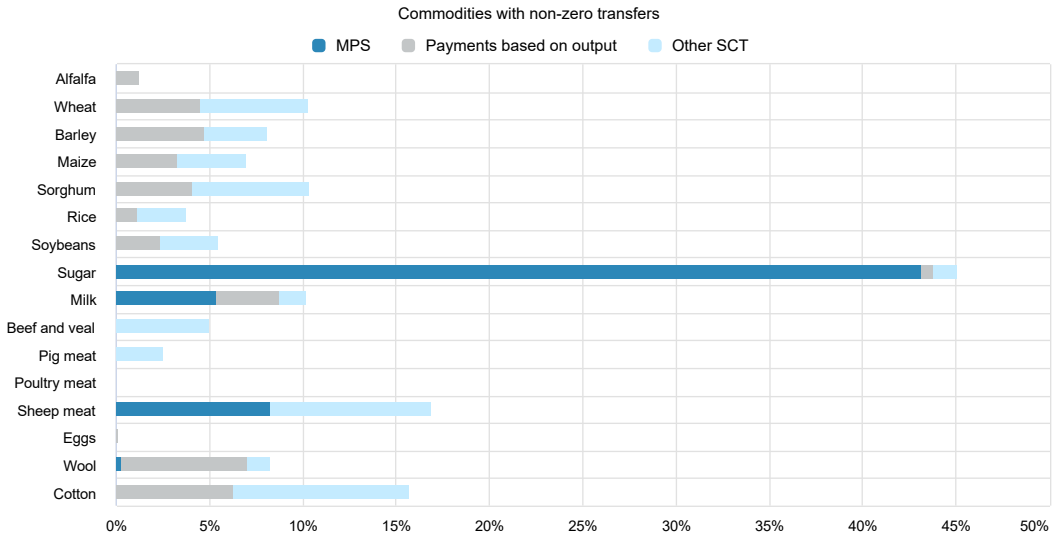
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 29.2. United States: Drivers of the change in PSE, 2020 to 2021



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 29.3. United States: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 29.1. United States: Estimates of support to agriculture

Million USD

	1986-88	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**143 469**	**193 454**	**393 864**	**355 956**	**373 538**	**452 097**
of which: *share of MPS commodities (%)*	78.31	73.64	78.38	76.16	77.36	81.61
Total value of consumption (at farm gate)	**124 148**	**164 683**	**312 998**	**294 789**	**301 286**	**342 918**
Producer Support Estimate (PSE)	**34 253**	**43 744**	**50 726**	**50 270**	**48 864**	**53 045**
Support based on commodity output	14 031	19 667	12 113	9 943	8 619	17 778
Market Price Support[1]	10 922	12 486	4 538	9 376	2 002	2 235
Positive Market Price Support	11 008	12 486	4 538	9 376	2 002	2 235
Negative Market Price Support	-86	0	0	0	0	0
Payments based on output	3 108	7 181	7 575	566	6 618	15 542
Payments based on input use	7 061	7 572	8 712	8 609	9 057	8 471
Based on variable input use	3 697	3 091	1 502	1 619	1 765	1 122
with input constraints	739	168	584	618	643	492
Based on fixed capital formation	1 233	361	2 003	2 042	2 036	1 930
with input constraints	1 233	358	1 916	1 891	2 019	1 837
Based on on-farm services	2 131	4 120	5 207	4 948	5 256	5 419
with input constraints	349	677	1 631	1 455	1 644	1 795
Payments based on current A/An/R/I, production required	12 231	5 655	19 361	23 286	16 203	18 595
Based on Receipts / Income	912	2 055	2 435	2 205	2 327	2 775
Based on Area planted / Animal numbers	11 319	3 600	16 926	21 081	13 877	15 820
with input constraints	2 565	1 570	16 905	21 081	13 823	15 810
Payments based on non-current A/An/R/I, production required	0	0	122	365	2	0
Payments based on non-current A/An/R/I, production not required	338	8 789	8 485	6 098	13 076	6 282
With variable payment rates	0	3 969	8 479	6 080	13 076	6 282
with commodity exceptions	0	3 969	8 479	6 080	13 076	6 282
With fixed payment rates	338	4 819	6	18	0	0
with commodity exceptions	0	4 819	0	0	0	0
Payments based on non-commodity criteria	592	2 061	1 932	1 970	1 907	1 920
Based on long-term resource retirement	592	2 050	1 921	1 961	1 900	1 902
Based on a specific non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	11	11	8	7	17
Miscellaneous payments	0	0	0	0	0	0
Percentage PSE (%)	**20.54**	**19.47**	**11.53**	**12.67**	**11.62**	**10.55**
Producer NPC (coeff.)	**1.11**	**1.11**	**1.03**	**1.03**	**1.02**	**1.04**
Producer NAC (coeff.)	**1.26**	**1.24**	**1.13**	**1.15**	**1.13**	**1.12**
General Services Support Estimate (GSSE)	**3 108**	**6 164**	**10 396**	**11 248**	**9 476**	**10 464**
Agricultural knowledge and innovation system	1 129	1 805	2 792	2 732	2 735	2 908
Inspection and control	372	685	1 274	1 254	1 271	1 298
Development and maintenance of infrastructure	13	461	2 770	3 730	2 188	2 393
Marketing and promotion	495	957	1 867	1 846	1 586	2 169
Cost of public stockholding	0	107	41	44	40	40
Miscellaneous	1 100	2 149	1 651	1 642	1 656	1 656
Percentage GSSE (% of TSE)	**6.55**	**8.89**	**9.14**	**10.56**	**8.82**	**8.23**
Consumer Support Estimate (CSE)	**-1 647**	**5 158**	**45 539**	**32 971**	**44 674**	**58 971**
Transfers to producers from consumers	-10 379	-12 192	-4 502	-9 270	-2 002	-2 235
Other transfers from consumers	-1 651	-2 075	-2 516	-2 733	-2 442	-2 372
Transfers to consumers from taxpayers	10 089	19 425	52 557	44 974	49 118	63 578
Excess feed cost	294	0	0	0	0	0
Percentage CSE (%)	**-1.44**	**3.55**	**17.49**	**13.20**	**17.72**	**21.11**
Consumer NPC (coeff.)	**1.11**	**1.09**	**1.02**	**1.04**	**1.02**	**1.01**
Consumer NAC (coeff.)	**1.01**	**0.97**	**0.85**	**0.88**	**0.85**	**0.83**
Total Support Estimate (TSE)	**47 450**	**69 333**	**113 679**	**106 492**	**107 458**	**127 087**
Transfers from consumers	12 030	14 267	7 018	12 003	4 444	4 607
Transfers from taxpayers	37 071	57 141	109 177	97 223	105 456	124 852
Budget revenues	-1 651	-2 075	-2 516	-2 733	-2 442	-2 372
Percentage TSE (% of GDP)	**0.97**	**0.65**	**0.52**	**0.50**	**0.51**	**0.55**
Total Budgetary Support Estimate (TBSE)	**36 528**	**56 847**	**109 141**	**97 116**	**105 456**	**124 852**
Percentage TBSE (% of GDP)	**0.75**	**0.54**	**0.50**	**0.45**	**0.50**	**0.54**
GDP deflator (1986-88=100)	**100**	**139**	**200**	**196**	**199**	**207**
Exchange rate (national currency per USD)	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for the United States are: wheat, maize, barley, sorghum, alfalfa, cotton, rice, soybean, sugar, milk, beef and veal, sheep meat, wool, pig meat, poultry and eggs.
Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

An omnibus legislative package known as the Farm Bill primarily governs agricultural policy in the United States. Farm Bills authorise agricultural and food policies in areas including nutrition assistance, crop insurance, commodity support, conservation and agricultural research. Each Farm Bill amends previous agricultural and related policies, and establishes new policies on a five-year cycle that can be extended or shortened depending on legislative priorities.

Historically, the commodity support component of Farm Bills focused on stabilising and boosting farm income to aid economic recovery and development during the Depression and post-war eras through price and income support for a specified set of commodities, including but not limited to corn, soybeans, wheat, cotton, rice, peanuts, dairy, and sugar (OECD, 2011[1]). Over time, Farm Bills expanded in scope: the 1973 Farm Bill first included a nutrition title while subsequent farm bills added titles on policy areas such as agricultural trade, farm credit, rural development and crop insurance. The 1985 Farm Bill added conservation provisions; the 1990 Farm Bill, organic agriculture; the 1996 Farm Bill, agricultural research; the 2002 Farm Bill, bioenergy; and the 2008 Farm Bill, horticulture and local food systems (Congressional Research Service, 2019[2]).

Agricultural policy reform in the United States has been characterised by a significant shift towards less production- and trade-distorting forms of support. Commodity programmes originally supported farm incomes through a combination of taxpayer-funded production payments and supply management in the form of acreage limits and commodity storage programmes. The Food Security Act of 1985 introduced changes that moved farmers towards more market orientation by reducing price supports in favour of direct payments, introducing greater planting flexibility and giving more attention to export opportunities for US farm products (OECD, 2011[1]).

Reforms continued with subsequent Farm Bills. The 1996 Farm Bill[1] re-designed income support programmes by replacing target prices, price-based deficiency payments and acreage controls with historically based direct payments independent of current production. A series of ad hoc emergency top-up payments supplemented the historically based payments implemented under the 1996 Farm Bill to provide additional assistance in the face of low commodity prices. These ad hoc payments were institutionalised under the 2002 Farm Bill[2] as counter-cyclical payments linked to the historically based direct payments, and continued under the 2008 Farm Bill[3] (OECD, 2011[1]). The 2014 Farm Bill ended these direct and counter-cyclical payments but continued direct income support based on historical production with programmes triggering payments based on either reference prices or revenue benchmarks. It also ended the dairy price support programme, replacing it with a premium-based milk-to-feed margin protection programme. The 2018 Farm Bill continued these programmes with only small adjustments (Table 29.2).

The largest of the farm programmes in the Farm Bill, the Federal Crop Insurance Program (FCIP), was established in the 1930s to cover yield losses from most natural causes.[4] The programme's current form was authorised by the Federal Crop Insurance Act of 1980 and modified by subsequent Farm Bills and other legislation. The 1980 Act introduced federal premium subsidies and brought in private insurance companies (Approved Insurance Providers, or AIPs) to deliver crop insurance policies. The catastrophic (CAT) coverage level was created in 1994, under which 100% of the premium is subsidised and producers pay a fee for coverage of yield loss greater than 50% at 55% of the base commodity price.[5] The Agricultural Risk Protection Act of 2000 expanded the geographic availability of insurance, increased premium subsidy levels, and removed restrictions on livestock insurance products.

Table 29.2. United States: Main agricultural policy trends

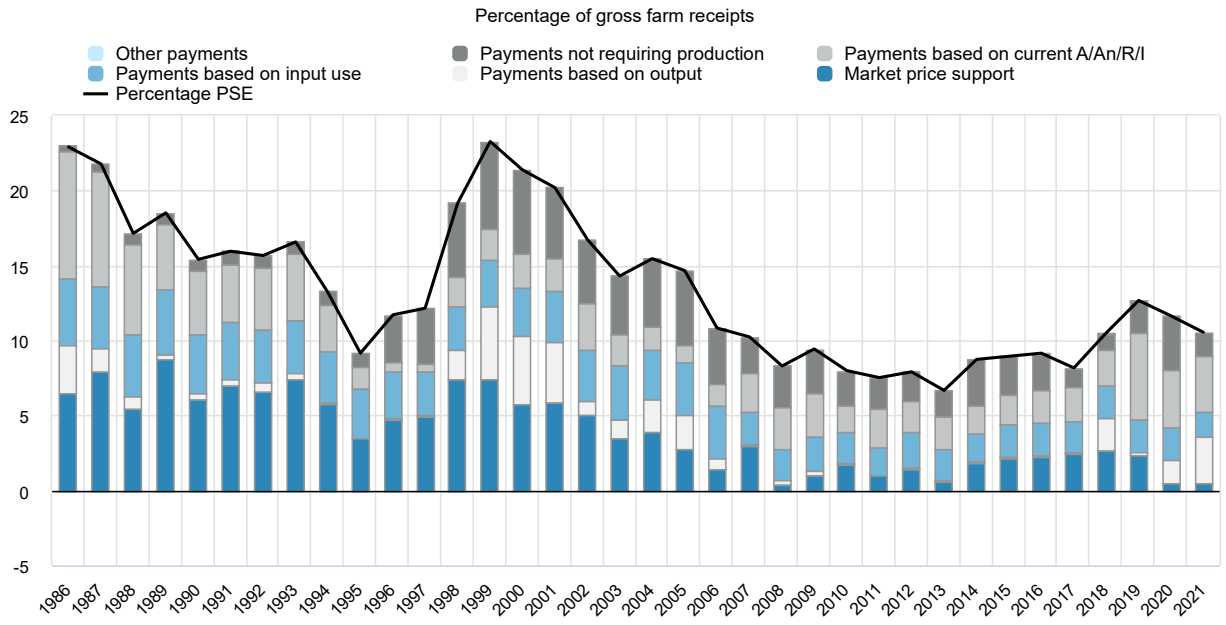
Period	Framework	Changes in agricultural policies
1980	Federal Crop Insurance Act of 1980[1]	Introduced federal premium subsidies for crop insurance (30% at the 65% coverage level) Created a public-private partnership with private insurance companies (Approved Insurance Providers), which became responsible for delivering crop insurance policies
1985	Food Security Act of 1985	Established marketing loans for cotton and rice, removing market price support element of cotton and rice commodity loans Set up the Export Enhancement Programme and the Dairy Export Incentive Programme. Established the Conservation Reserve Programme (CRP) Established conservation cross-compliance requirements (highly erodible land and wetland conservation provisions)
1990	Food, Agriculture, Conservation, and Trade Act of 1990	Introduced 15% “normal flex acres” and 10% “optional flex acres” Extended marketing loan provisions to oilseeds in 1991, and to wheat and feed grains in 1993 Allowed oilseeds and alternative crops to be planted on land in a 0/85-92 programme without loss of payments.
1994	Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994[1]	Catastrophic (CAT) crop insurance coverage level created Increased premium subsidies for higher coverage levels (buy-up coverage)
1996	Federal Agriculture Improvement and Reform Act of 1996	Replaced crop deficiency payments and target prices with fixed direct payments decoupled from current prices and production levels to be reduced over time Eliminated most planting restrictions Extended marketing loan provisions to most other covered crops and created alternative direct Loan Deficiency Payments (LDP) Phased-out the dairy support price (although interim legislation modified this provision) Consolidated cost share and technical assistance programmes for crop and livestock producers into the Environmental Quality Incentives Programme (EQIP) Extended CRP authorisation and capped enrolment Lifted conservation cross-compliance requirements for crop insurance participation
2000	Agricultural Risk Protection Act of 2000[1]	Expanded the geographic availability of crop insurance, increased premium subsidy levels, and removed restrictions on development of livestock insurance products
2002	Farm Security and Rural Investment Act of 2002	Annually decreasing Production Flexibility Contract payments replaced by fixed Direct Payments programme Created the Counter-Cyclical Payments programme triggering supplemental direct income support payments when prices fell below targets Added soybeans and peanuts as covered commodities under the fixed Direct Payment and Counter-Cyclical Payments programme Increased payments for environmental conservation and protection Eliminated peanut price support quota system, buying out peanut quota rights
2008	Food, Conservation, and Energy Act of 2008	Retained Direct Payment, Counter-Cyclical Payment and Marketing Assistance Loan programmes Created the Average Crop Revenue Election (ACRE) as a revenue-based alternative to the Counter-Cyclical Payment programme Changed the dairy price support programme basis from milk price to prices of dairy products Increased marketing assistance loan rates and Counter-Cyclical Payment programme target prices for a number of programme crops and sugar Introduced a permanent disaster assistance programme (Supplemental Agricultural Disaster Assistance) to end the need for ad hoc programs Significantly increased funding for domestic food assistance programmes Ended the Export Enhancement Programme

Period	Framework	Changes in agricultural policies
2014	Agricultural Act of 2014	Repealed Direct Payment, Counter-Cyclical Payment, and ACRE programmes; created the Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC), which used the historical payment base established for the repealed programmes Added new crop insurance options: Supplemental Coverage Option (SCO), Stacked Income Protection Plan (STAX) for upland cotton; Expanded the Noninsured Crop Assistance Program (NAP) to allow for higher premium-based coverage Re-established conservation cross-compliance requirement to receive crop insurance premium subsidies Expanded programmes for specialty crops, organic farmers, bioenergy, rural development, and beginning farmers and ranchers, continuing orientation to technical assistance, research, and development loans.
2018	Agriculture Improvement Act of 2018	Continued 2014 Farm Bill programmes with only minor changes, with some additions to programmes for specialty crops, organic farmers, local and regional markets, and beginning, military veteran and minority farmers.

1. Crop insurance legislation.
Source: Congressional Research Service (2018[3]); OECD (2011[1]; 2014[4]; 2019[5]); USDA ERS (2020[6]).

Average producer support increased in recent years after reaching a low of 6.7% in 2013. Budgetary support increased over time, mainly due to increases in payments that require production (reflecting the increasing emphasis placed on farm insurance and risk management, including the Federal Crop Insurance Program). On the other hand, recent high world prices have reduced the role of MPS significantly. Payments based on output related to COVID-19-driven market disruptions have been important in the last two years (Figure 29.4).

Figure 29.4. United States: Level and PSE composition by support categories, 1986 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

The Agricultural Improvement Act of 2018 (the 2018 Farm Bill) provides the basic legislation governing farm programmes for 2019 to 2023. The twelve titles of the 2018 Farm Bill authorise policies for commodity programmes, conservation on agricultural land, agricultural trade promotion and international food aid, nutrition programmes, farm credit, rural development, agricultural research, forestry on private lands, energy, horticulture and organic agriculture, and crop insurance. Initial projections were that around 76% of budgetary spending under the 2018 Farm Bill would be for programmes in the Nutrition title – primarily the *Supplemental Nutrition Assistance Program* (SNAP) – with farm programmes accounting for less than 25% of projected budgetary outlays. Of the farm programmes, crop insurance was projected to account for 9% of total expenditures, and Commodities and Conservation for 7% each. The remaining titles together accounted for 1% of projected spending.

The primary crop commodity programmes under the 2018 Farm Bill include programmes that make payments to producers with historical base acres[6] of programme crops (wheat, feed grains, rice, oilseeds, peanuts, pulses and seed cotton) when prices fall below statutory minimums or when crop revenue is low relative to recent levels. Producers are not required to produce the covered commodity to receive payments on their historical base. Price Loss Coverage (PLC), a counter-cyclical price programme, makes a payment when market prices for covered crops fall below fixed reference prices. Agriculture Risk Coverage (ARC), a revenue-based programme, makes a payment when actual revenue at the county level falls below rolling average benchmark revenues. For both programmes, payments are made on 85% of base acres. For their base acre elections, participating producers were required to choose between the PLC and ARC programmes on a commodity-by-commodity basis for 2019 and 2020, then annually for each year for 2021-2023.

The crop insurance programme offers coverage options for both yield and revenue losses. Traditional crop insurance makes subsidised crop insurance available to producers who purchase a policy to protect against losses in yield, crop revenue, or whole farm revenue. In addition, the Supplementary Coverage Option (SCO) and Stacked Income Protection Plan (STAX) offer area-based insurance coverage, SCO in combination with traditional crop insurance policies and STAX for upland cotton producers.

Marketing assistance loans, non-recourse loans that can be repaid at market prices when those fall below the loan rate, are available for wheat, feed grains, cotton, rice, oilseeds, pulses, wool, mohair and honey. For dairy producers, the Dairy Margin Coverage (DMC) programme, insures a producer-elected margin-level between nationally defined milk price and feed costs for a premium, with payments made on enrolled historical milk production. The 2018 Farm Bill also allows producers to participate in both DMC and dairy livestock insurance programmes. Under the Milk Donation Reimbursement Program (MDP) fluid milk producers with pre-approved plans may be reimbursed for costs incurred in donating fluid beverage milk to low-income groups. Sugar is supported by a tariff rate quota (TRQ), together with provisions for non-recourse loans (not eligible for below loan rate repayment) and marketing allotments. TRQs are in place for dairy, beef and sheep meat and some other products. However, US agricultural tariffs are generally low, at 4.7% on average in 2019.

Federal agri-environmental programmes focus on land retirement, easements restricting land use options and measures to encourage crop and livestock producers to adopt practices that reduce environmental pressures on working land (cropland and grazing land in production). Working land programmes include the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP). Land retirement and easement programmes include the Agricultural Conservation Easement Program (ACEP) and the Conservation Reserve Program (CRP). The Regional Conservation Partnership Program offers options for regional or watershed-based conservation efforts that may combine both land retirement, easements, and working lands programmes. Production of ethanol and other biofuels is supported mainly in the form of mandated blending for fuel use, and loan and grant programmes. Eligibility for most federal commodity programme payments, including crop insurance premium subsidies, is subject to recipients

having established an individual farm-based conservation plan to protect highly erodible cropland and wetlands.

Other farm programmes include direct and guaranteed loans (including microloans) for farmland purchase and for operating credit, designed to assist producers who face difficulty obtaining credit in the private market, particularly beginning, military veteran and socially disadvantaged farmers. Farm Bill programmes also support public agricultural research and technical assistance, including programmes targeted to specialty crops; organic production; pest and disease prevention; the promotion of sustainable farming practices; and standing disaster programmes for livestock, forage, and trees, bushes and vines to help producers cope with production, financial and physical losses related to or caused by natural disasters.

Climate change mitigation policies in agriculture

Most agricultural emissions are due to N_2O emissions from agricultural soils (55%), with emissions from manure and enteric fermentation accounting for most of the rest (41%). Agricultural emissions were 9.5% (628.6 $MtCO_2eq$) of total GHG emissions in 2019, up from 8% (596.3 $MtCO_2eq$) in 2005.

The United States drafted three reports covering activities and strategy to mitigate climate risk:

- The *US National Climate Strategy*, (forthcoming) details how the United States will deliver on its Nationally Determined Contribution (NDC) for 2030.
- The *Long-Term Strategy of the United States to Reach Net-Zero Emissions by 2050* describes how near-term policies and actions will deliver a pathway to reach net-zero by 2050 (United States Department of State, 2021[7]).
- The *US National Communication and Biennial Report* contains detailed information on policies and measures across all areas of US climate action as of December 2020 (United States, 2020[8]).

The United States' NDC under the Paris Agreement set an economy-wide target of reducing GHG emissions 50-52% below 2005 levels by 2030, covering all sectors (United States, 2020[9]). The NDC does not contain sector-specific targets, but it acknowledges that agriculture and land use will likely contribute to meeting overall GHG emissions targets. The NDC states that the United States will support scaling climate-smart agricultural practices including, for example, cover crops, reforestation, rotational grazing and nutrient management practices.

The United States is party to the Global Methane Pledge, which commits countries to reducing methane emissions at least 30% from 2020 levels by 2030. While it focuses on fossil methane, the pledge covers all sources, including agricultural emissions. The pledge has 110 participating countries. While the pledge commits the United States to reduce methane emissions, it is not yet codified into US regulation.

At COP26, the United States and United Arab Emirates launched the Agriculture Innovation Mission for Climate (AIM for Climate) alongside 31 countries and over 48 non-government partners. The United States announced plans to mobilise USD 1 billion in investment in climate-smart agriculture and food systems innovation over 2021-25. The AIM for Climate initiative has three objectives:

1. Demonstrate collective commitment to significantly increasing investment in agricultural innovation for climate-smart agriculture and food systems over the next five years.
2. Support technical discussions and promote expertise across international and national levels of innovation to amplify the impact of participants' investments.
3. Support exchanges between ministers, chief scientists and other stakeholders as key focal points and champions for co-operation on climate-related agricultural innovation to engender greater co-creation and co-operation on shared research priorities.

The initiative will focus on accelerating investment in climate-smart agricultural innovation and scientific breakthroughs via agricultural research through government and academic research institutions; public

and private applied research, including through support to international research centres, institutions and laboratory networks; and development, demonstration and deployment of practical help for producers and other market participants, including through national agricultural research extension systems.

Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad", signed in January 2021, directs Federal agencies to coordinate a government-wide approach to the climate crisis. It tasked the USDA with drafting recommendations for a climate-smart agriculture and forestry (CSAF) strategy. In response, the USDA issued a progress report in May 2021 containing seven recommended elements for the CSAF strategy:

- prepare the USDA to quantify, track, and report the benefits of CSAF activities
- develop a CSAF strategy that works for all farmers, ranchers, forest landowners and communities
- leverage existing USDA programmes to support CSAF strategies
- strengthen education, training and technical assistance for CSAF practices
- support new and better markets for agriculture and forestry products generated through CSAF practices
- develop a forest and wildfire resilience strategy
- improve research

The USDA is continuing outreach to shape the CSAF strategy, which it will develop and implement based on stakeholder feedback.

Several initiatives are in place that provide preferential credit, grants or other support to promote the adoption of GHG mitigation practices. AgSTAR: Biogas Recovery in the Agriculture Sector is a collaborative programme sponsored by the Environmental Protection Agency (EPA) and USDA to promote the use of biogas recovery systems to reduce methane emissions from livestock waste. The programme provides outreach materials and project development tools to interested producers and informs them about funding resources, carrying out pre-feasibility analyses, and linking producers with experts from government, academia and industry to realise anaerobic digester projects on farms. The EPA estimates that the AgSTAR programme has to date resulted in emissions reductions of 2.11 $MtCO_2eq$, including 1.77 $MtCO_2eq$ in direct emissions reductions.

Adoption of cover crops as a soil carbon sequestration strategy is increasingly supported by financial incentives. The temporary Pandemic Cover Crop Program (PCCP) encourages cover crops by providing reduced crop insurance premiums for producers who plant a qualifying cover crop during the 2021 or 2022 crop years. PCCP was offered as part of the COVID-19 Pandemic Assistance for Producers. This benefit was in addition to state-level crop insurance premium benefit programs in Illinois, Indiana and Iowa.

Several programmes with broad conservation objectives offer climate mitigation benefits, including CRP, CSP, EQIP, CTA, RCPP and ACEP. Some of these received updates in 2021 to increase their climate benefits. For example, a pilot programme under EQIP launched in 10 states in June 2021 provides USD 10 million to support climate-smart agriculture and forestry through targeted conservation practices. The pilot is intended to help agricultural producers plan and implement voluntary conservation practices that sequester carbon, reduce GHG emissions and mitigate the impacts of climate change on working lands. Similarly, existing USDA research programmes support work related to climate change and GHG reduction, for example including feasibility studies of agrovoltaics (co-location of solar electricity generation and agricultural production) and "on-farm trials" of innovative conservation practices for GHG mitigation.

The first phase of the CRP Climate Change Mitigation Assessment Initiative was launched in October 2021. This USD 10 million initiative will sample, measure, and monitor soil carbon on CRP acres to quantify the climate outcomes of the programme. In conjunction with partner institutions, the initiative will sample soil carbon for three categories of CRP practice types: perennial grass, trees, and wetlands.

The USDA produced several decision tools and datasets to support GHG emissions reductions:

- The Greenhouse Gas Reduction through Agricultural Carbon Enhancement Network (GRACEnet) of coordinated multi-location field studies provides research estimates of GHG emissions from cropped and grazed soils under current and improved management practices.
- CarbON Management Evaluation Tools (COMET), COMET-Farm and COMET-Planner are free online tools that provide a platform for farms to estimate changes in carbon sequestration from the implementation of certain management practices.
- Rapid Carbon Assessment (RaCA) is a large-scale soil survey to develop statistically reliable estimates of carbon stocks across the conterminous United States.
- The Science of Soil Health Initiative from USDA-NRCS gathers, processes and disseminates data for assessment and monitoring of the impacts of management on soil health.
- The Dairy Gas Emissions Model (DairyGEM) is a software to estimate ammonia, hydrogen sulphide and GHG emissions in dairy production systems, and how these are influenced by climate and farm management decisions.

Research, innovation and knowledge transfer are all key to US climate mitigation policy. Research programs are underway at several USDA agencies, including NIFA, ARS and the Forest Service. On knowledge transfer, the USDA Climate Hubs develop science-based information and technologies, and deliver them in co-operation with USDA agencies and partners to agricultural and natural resource managers to support climate-informed decision-making and implementation of climate-smart practices. The ten regional hubs in the network produce region-specific resources on a variety of topics, including a number of resources related to carbon and greenhouse gases. State-level extension services also provide outreach, training, technical assistance and on-farm testing of climate mitigation practices.

The United States has a robust biofuel policy landscape aimed at reducing emissions from fossil fuel combustion. While not directly targeting the agricultural sector, biofuel policies are closely linked with agriculture through biofuel feedstocks (primarily corn and soy in the US). At the federal level, the Renewable Fuel Standard (RFS) establishes the minimum volume of biomass-derived fuels blended into transportation fuel, effectively establishing standards on fuel composition. State-level low-carbon fuel programs in California and Oregon also encourage higher production and use of fuels with lower carbon intensities, such as corn-based ethanol, biodiesel, or renewable diesel.

Finally, in the category of market-based instruments to incentivise emissions reductions, regional and state-level emissions trading schemes – in some cases working in concert with private entities – are in place or in the process of being set up in California, Washington, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont and Virginia. While agriculture is not required to reduce carbon emissions under these programmes, it is a permitted source of offsets in all of them.

Domestic policy developments in 2021-22

US policy developments in 2021 continued to focus largely on helping producers, consumers, and the agro-food sector cope with the impacts of the COVID-19 pandemic, with several new programmes and initiatives introduced to strengthen supply chains, address inequities in previous producer support, and bolster food and nutrition security. New programmes or initiatives were launched to help ensure that USDA programming in the aftermath of the recovery is focused on ensuring that a more resilient sector emerges from the crisis by improving environmental sustainability and mitigating the impacts of climate change.

The sole policy change to **direct payment** programmes in 2021 was the establishment of the Supplemental Dairy Margin Coverage (DMC) programme in December 2021, to allow small and medium-sized dairy operations with less than 5 million pounds (2.268 million kg) of established production history to enrol

supplemental production based on a formula using 2019 milk sales. The supplemental DMC coverage will be available for calendar years 2021, 2022 and 2023, with participating operations eligible to receive retroactive supplemental payments for 2021. At the same time, USDA also updated the alfalfa hay component of the DMC feed cost formula to better reflect the actual cost dairy farmers pay for high-quality alfalfa hay.

Several changes to **disaster assistance** programmes were launched in 2021. A new Quality Loss Adjustment (QLA) programme was launched under the Wildfire and Hurricane Indemnity Program Plus (WHIP+) programme in January 2021 for producers who suffered eligible crop quality losses due to natural disasters occurring in 2018 and 2019. Assistance was based on affected production with at least a 5% quality loss. The original WHIP+ programme provided assistance for only 50% of the calculated payment of crop losses. However, in June 2021, a second tranche of payments was announced, bringing total assistance to 90% of the programme's total calculated payment. A third tranche covering the final 10% was authorised in November 2021.

Assistance under the Emergency Assistance for Livestock, Honey Bees and Farm-raised Fish Program (ELAP) was expanded to cover feed transportation costs for drought-impacted ranches. ELAP already covers the cost of hauling water during drought, and this change expands the programme beginning in 2021 to cover feed transportation costs where grazing and hay resources have been depleted. Under the revised policy for feed transportation cost assistance, eligible ranchers will be reimbursed 60% of feed transportation costs above what would have been incurred in a normal year. Producers qualifying as underserved (socially disadvantaged, limited resource, beginning or military veteran) will be reimbursed for 90% of the feed transportation cost above what would have been incurred in a normal year.

Several initiatives were launched in 2021 to ensure more equitable access to USDA programming for historically underserved populations. These include:

- Risk management education, with an investment of nearly USD 1 million in funding for targeted risk management training and educational tools.
- Outreach and technical assistance to support participation in Farm Service Agency (FSA) programming via USD 4.7 million in funding to establish partnerships with selected organisations.
- Targeted technical assistance to connect underserved producers with USDA programmes and services. 20 organisations (including the National Black Farmers Association, the Intertribal Agriculture Council, and the Farmer Veteran Coalition) will share USD 75 million in funding under ARPA to work with producers under co-operative agreements.

The new Heirs' Property Relending Program (HPRP) provides loans to help agricultural producers and landowners resolve land ownership and succession issues. Intermediary lenders – co-operatives, credit unions, and non-profit organisations – can apply for loans of up to USD 5 million at 1% interest. HPRP was authorised by the 2018 Farm Bill, but 2021 marks the first time that loans will be disbursed under the programme, after the publication of the programme's final rule on 9 August 2021.

Several new products were added to the **crop insurance** programme in 2021, including a new option for small-scale producers. The new Micro Farm policy for small-scale producers (revenues of USD 100 000 or less) who sell their production locally will be offered through Whole-Farm Revenue Protection (WFRP). This policy option allows for simplified record keeping and covers post-production costs such as washing and packaging value-added products, and will be available beginning with the 2022 crop year.

A new insurance product designed to facilitate the uptake of certain natural resource-conserving practices will also be offered to begin in crop year 2022. Farmers of non-irrigated corn in certain states who "split apply" nitrogen can purchase the Post Application Coverage Endorsement (PACE). PACE covers projected yield lost when producers are unable to apply in-season nitrogen. This split application of nitrogen can both lower input costs and prevent runoff or leaching of nutrients into waterways and groundwater.

Some changes to existing crop insurance products were made to support conservation and climate mitigation goals. Temporary provisions allowing producers to hay, graze, or chop cover crops for silage, haylage, or baleage at any time and still receive 100% of the prevented planting payment were made permanent.[7] The "1 in 4" requirement (meaning that the land must be planted, insured and harvested in at least one of the four most recent crop years) was made more flexible, recognising different farm practices and the availability of other risk management options, such as NAP. This included permitting annual regrowth for insured perennials, allowing a crop covered by NAP to show they had met the insurability requirement, or allowing the producer to prove that their acreage was planted and harvested using good farming practices in instances where neither crop insurance nor NAP were available.

In 2021 several policies intended to improve **supply chain functionality** were also implemented. The new Meat and Poultry Inspection Readiness Grant (MPIRG) programme provides USD 55.2 million in competitive grant funding to cover costs of meat and poultry slaughter and processing facilities for necessary improvements to achieve a Federal Grant of Inspection under the Federal Meat Inspection Act or the Poultry Products Inspection Act, or to operate under a state's Cooperative Interstate Shipment programme. MPIRG's Planning for a Federal Grant of Inspection (PFGI) project is for processing facilities that are working toward Federal inspection. MPIRG's Cooperative Interstate Shipment (CIS) Compliance project is available for processing facilities located in states with a Food Safety and Inspection Service (FSIS) CIS programme. These states currently include Indiana, Iowa, Maine, Missouri, North Dakota, Ohio, South Dakota, Vermont and Wisconsin.

A new "Dealer Statutory Trust to Protect Livestock Sellers," was established. This requires livestock dealers to hold all livestock or proceeds from their sale in trust for the benefit of all unpaid cash sellers of livestock until they have received full payment. Livestock sellers who do not receive timely payment from a dealer may file claims on the dealer statutory trust. Dealers whose average annual livestock purchases do not exceed USD 100 000 are exempt.

USDA's Build Back Better initiative includes a mix of grants, loans, and financing mechanisms for several new programmes, including the Food Supply Chain Guaranteed Loan Program, which was launched on 9 December. This programme will make available nearly USD 1 billion in loan guarantees to back loans of up to USD 40 million to start up or expand food supply chain activities, address supply chain bottlenecks, or increase capacity and help create a more resilient, diverse and secure US food supply chain.

Several changes to **conservation** programmes were initiated in 2021. Changes to the existing CRP focused on increasing enrolment by up to 4 million new acres (1.619 million ha) to reach the current statutory enrolment cap. Other changes focused on expanding the programme's role in climate change mitigation, including:

- A new Climate-Smart Practice Incentive for the general and continuous CRP signups, intended to increase carbon sequestration and reduce GHG emissions. These practices include establishment of trees and permanent grasses, development of wildlife habitat, and wetland restoration. The Climate-Smart Practice Incentive is annual, and the amount is based on the benefits of each practice type.
- Increased NRCS technical assistance capacity, which will include the establishment of a soil sampling protocol to help establish a baseline for soil carbon on CRP-enrolled land.
- Increasing Practice Incentives Payments from 20% to 50% of installation costs for continuous CRP practices.
- Increasing Water Quality practice payments from 10% to 20% of annual rental payments for certain practices available through the CRP continuous signup, such as grassed waterways, riparian buffers, and filter strips.
- Establishing a CRP Grassland minimum rental rate, which will benefit more than 1300 counties with rates currently below the minimum

- Making Highly Erodible Land Initiative (HELI) practices available as eligible practices in both the general and continuous signups
- Expanding the Clean Lakes, Estuaries and Rivers 30-year contracts (CLEAR30) from its original coverage in the Great Lakes and Chesapeake Bay areas to nationwide availability.

Conservation Incentive Contracts (CIC) were piloted in selected states in 2021. CIC blends EQIP and the CSP, by providing producers with assistance to adopt both conservation practices and enhancements to working landscapes. After refinements, these contracts will be available nationwide in fiscal year 2022. Of the total USD 41.8 million offered, USD 11.8 million will be set aside specifically for drought-related practices.

A number of initiatives in the area of **domestic food assistance** were introduced in 2021. An investment of up to USD 1 billion (including USD 500 million in ARPA funding and USD 500 million from the Consolidated Appropriations Act, 2021) was announced in June to support and expand emergency food assistance. Building on lessons learned during the COVID-19 pandemic, USDA will enter into co-operative agreements with state, Tribal, and local entities to more efficiently purchase food from local producers and enable partner organisations to reach underserved communities. The initiative provides USD 500 million to support emergency food assistance through the Emergency Food Assistance Program (TEFAP), up to USD 400 million to support local, regional, and socially disadvantaged farmers and up to USD 100 million in grants to build capacity for food banks and expand reach into underserved areas.

The Local Food Purchase Assistance Cooperative Agreement Program (LFPA) was announced in December, as part of the USD 1 billion expansion of emergency food networks. LFPA provides a total of USD 400 million to state and tribal governments for emergency food assistance purchases of local foods. This programme is managed by USDA's Agricultural Marketing Service and will provide organisations the flexibility to design food purchasing programmes and establish partnerships with farmers and ranchers within the state or within 400 miles (644 km) of the delivery destination that best suit their local needs, accommodates environmental and climate conditions, accounts for seasonal harvests, and meets the needs of the population within their service area.

SNAP benefits were raised beginning in October 2021 by USD 36.24 per person per day, subsequent to a re-evaluation in the cost of the Thrifty Food Plan (an estimate of the cost of a nutritious, practical cost-effective diet). This benefit increase represents the first time that the purchasing power estimate of the plan has changed since it was introduced in 1975.

Domestic policy responses to the COVID-19 pandemic

A new slate of programmes was announced in March 2021 to bring financial assistance to farmers, ranchers and producers who felt the impact of COVID-19 market disruptions, under the umbrella of the USDA Pandemic Assistance for Producers initiative. This new initiative targets a broader set of producers than previous COVID-19 aid programmes. The programme was divided into four parts:

- Part 1: Investing to expand help and assistance to more producers (USD 6 billion).
- Part 2: Adding USD 500 million of new funding to existing programmes.
- Part 3: Implementing formula-based additional payments under the Coronavirus Food Assistance Program (CFAP) 1 and CFAP 2, resulting in an additional USD 1.1 billion in payments under CFAP 1 for cattle producers, and an additional USD 4.8 billion under CFAP 2 for flat rate or price trigger crops (including corn, cotton, hemp, peanuts, rice, sorghum, soybeans, sugar beets, and wheat). Additional CFAP assistance (CFAP AA) will be provided through additional payment formula adjustments and coverage of several previously ineligible commodities and producers.
- Part 4: Reopening CFAP 2 sign-up to improve access and outreach to underserved producers

Temporary programmes funded through Part 1 of this initiative included:

- The Pandemic Cover Crop Program helped to defray the cost of adoption of the practice in the 2021 crop year during the pandemic while furthering the use of cover crops as a soil carbon sequestration strategy. The premium support was USD 5 per acre (USD 12.35 per ha), but no more than the full premium owed.
- The Pandemic Livestock Indemnity Program (PLIP) provided assistance to livestock and poultry producers who suffered losses during the pandemic due to insufficient access to processing. PLIP payments were based on 80% of the fair market value of the livestock and poultry and for the cost of depopulation and disposal of the animal. Eligible livestock and poultry include swine, chickens and turkeys.
- The Pandemic Market Volatility Assistance Program (PMVAP) authorised about USD 350 million in assistance to dairy farmers who received a lower revenue for their products due to market disruptions caused by the pandemic. The payment rate varied by region based on the actual losses on pooled milk related to price volatility. USDA made payments through agreements with independent handlers and cooperatives.
- The Dairy Donation Program (DDP) reimbursed some expenses related to dairy product donations to individuals and families in need. Reimbursed costs included the cost of milk used to make the donated eligible dairy product and some of the manufacturing and transportation costs.
- The Pandemic Response and Safety Grant (PRS) programme offered assistance to small businesses to recover costs incurred by responding to the COVID-19 pandemic, including for measures to protect workers. Assistance was provided to small-scale specialty crop producers and processors, meat and other processors, distributors, and farmers markets. Approximately USD 650 million was authorised for the PRS grants.
- The Organic and Transitional Education and Certification Program (OTECP) provided USD 20 million to cover certification and education expenses for producers who were certified or transitioning to organic. Both certified organic operations and transitional operations could apply for eligible expenses paid during the 2020, 2021, and 2022 fiscal years.
- The Spot Market Hog Pandemic Program (SMHPP) provided up to USD 50 million to assist hog producers who sold hogs through a negotiated sale during the first several months of the pandemic, when producers faced the greatest reduction in market prices due to employee illness and supply chain disruptions.

Several programmes were instituted to provide assistance to wider agro-food supply chains. The Farm and Food Workers Relief (FFWR) grant programme provided USD 700 million in competitive grant funding to help farmworkers and meatpacking workers with pandemic-related health and safety costs. The programme provided relief to farmworkers, meatpacking workers, and front-line grocery workers for expenses incurred due to the COVID-19 pandemic, including costs for reasonable and necessary personal, family, or living expenses, such as costs for personal protective equipment, dependent care, and expenses associated with quarantines and testing.

The Biofuel Producer Program provided up to USD 700 million for biofuel producers who faced unexpected market losses due to the pandemic. The programme, authorised by the CARES Act, made direct payments to biofuel producers based on the producer's market loss volume in 2020, calculated as the amount of fuel produced in 2020 compared with 2019.

Various changes to food assistance programs were enacted in 2021 in response to the continued pandemic. Benefits received under the Pandemic Electronic Benefits Transfer (P-EBT), first launched in March 2020, were increased by approximately 15%, providing more money to low-income households with children to cover the costs of school meals missed due to pandemic-related disruptions. In April 2021 the P-EBT was expanded to all low-income children of all ages for the summer months. On 20 April, USDA announced that the National School Lunch Program and School Breakfast Program's Seamless Summer Option (SSO) and the Summer Food Service Program would be allowed to provide free meals to all

children in all months and areas, regardless of an area's eligibility to operate these programmes under typical circumstances.

Funding under ARPA also allowed the temporary expansion of benefits through the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) for up to four consecutive months from April 2021 to 30 September 2021. USDA offered states the option of boosting the cash-value voucher to allow participants to purchase more fruits and vegetables. An additional increase in WIC benefits was instituted in all states from 1 October through 31 December 2021.

SNAP provided an additional USD 1 billion per month in food assistance by providing emergency allotment benefits to households that had not received the benefit previously because they were at or close to receiving the current maximum benefit. These emergency allotments were in addition to a 15% increase in benefit levels, originally funded through June 2021, then extended through September at an estimated cost of USD 3.5 billion.

Trade policy developments in 2021-22

On 31 October 2021, the United States and the European Union reached an agreement concerning US tariffs on imports of steel and aluminium from the European Union that had led to retaliatory tariffs on a range of US agricultural and other exports to the European Union. Under the terms of the agreement, the United States will replace existing Section 232 tariffs on EU steel and aluminium with a new duty-free tariff-rate quota (calculated in reference to historically-based trade volumes) effective 1 January 2022. In return, the European Union will end retaliatory tariffs on American goods, including bourbon, nuts, orange juice, and peanut butter.

As part of the 2021 UN Food Systems Summit in September, the United States launched a Coalition for Sustainable Productivity Growth for Food Security and Resource Conservation (the SPG Coalition). The SPG Coalition aims to accelerate the transition to more sustainable food systems through agricultural productivity growth that optimises agricultural sustainability across social, economic, and environmental dimensions. The SPG Coalition is open to all sectors of agriculture, including crops, livestock, poultry and aquaculture. It is intended to accelerate sustainable productivity growth that considers impacts and trade-offs among multiple objectives, including, but not limited to, food security, food safety, food affordability, diet quality, farmer income, farm worker income and wellbeing, food loss and waste, resource conservation, biodiversity, and climate change mitigation. Efforts aim to build on and extend international and country specific sustainability frameworks and best practices. As of the end of October, more than 50 organisations and countries had officially declared their support for the Coalition.

Contextual information

The United States is the world's second largest economy by GDP in PPPs and the third largest country by land area and population. US GDP per capita is among the highest in the world, more than three times the average of the countries included in this report (Table 29.3). Primary agriculture accounts for a small part of the economy – around 1% of GDP and 1.6% of employment – but agro-food accounts for over 12% of total exports. The US agricultural sector benefits from a large domestic consumer market, as well as abundant arable and pasture land and diverse climatic conditions that support the production of a wide range of commodities. In recent years, total agricultural production has been divided relatively equally between crops and livestock, although their shares vary over time. Key industries include grains (maize and wheat), oilseeds (soybeans), cotton, cattle, dairy, poultry and fruits and vegetables.

Table 29.3. United States: Contextual indicators

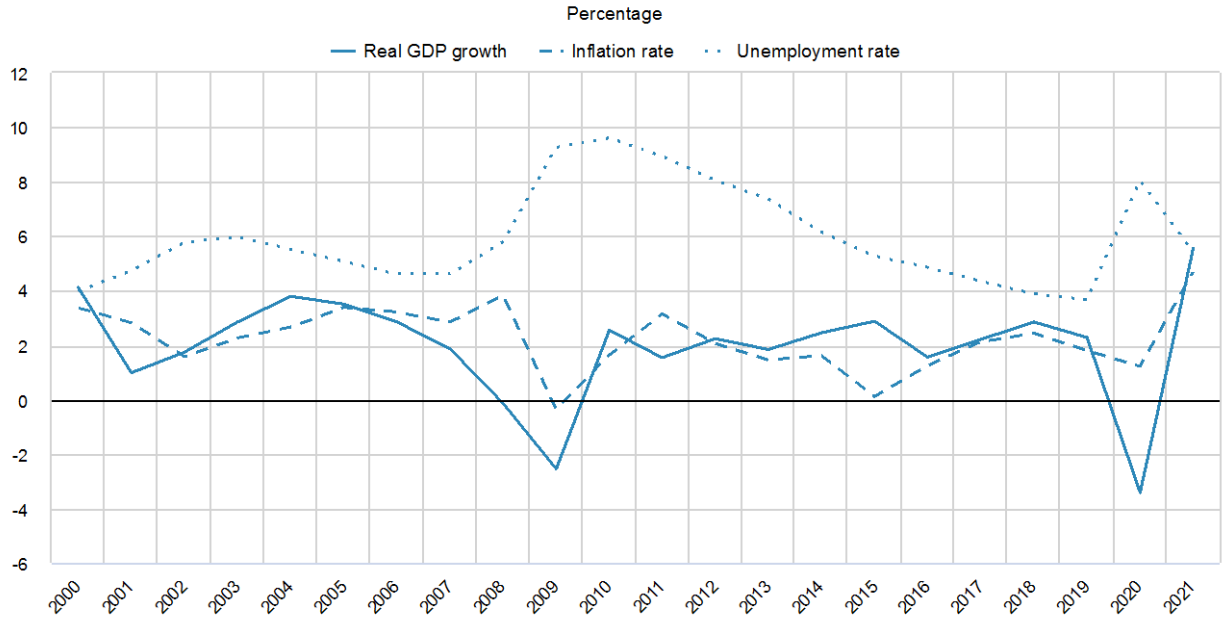
	United States		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	10 251	20 894	25.7%	19.1%
Population (million)	282	330	6.6%	6.3%
Land area (thousand km^2)	9 162	9 147	11.2%	11.1%
Agricultural area (AA) (thousand ha)	414 399	405 810	13.8%	13.8%
			All countries[1]	
Population density (inhabitants/km^2)	31	36	53	63
GDP per capita (USD in PPPs)	36 300	63 285	9 281	20 929
Trade as % of GDP	9	9	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	1.2	1.0	2.9	4.9
Agriculture share in employment (%)	1.8	1.6	-	-
Agro-food exports (% of total exports)	7.8	12.3	6.2	8.5
Agro-food imports (% of total imports)	3.5	6.3	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	56	61	-	-
Livestock in total agricultural production (%)	44	39	-	-
Share of arable land in AA (%)	42	39	32	34

Note: *or closest available year.
1. Average of all countries covered in this report.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

Real GDP grew by nearly 6% in 2021. Supply disruptions related to the COVID-19 pandemic are expected to continue to ease, facilitating stronger consumption growth in the near-term. However, higher wages, housing and energy costs will keep inflation near record highs (Figure 29.5). The labour market has recovered nearly all the jobs lost since the onset of disruptions caused by COVID-19 pandemic, and the current unemployment rate is low.

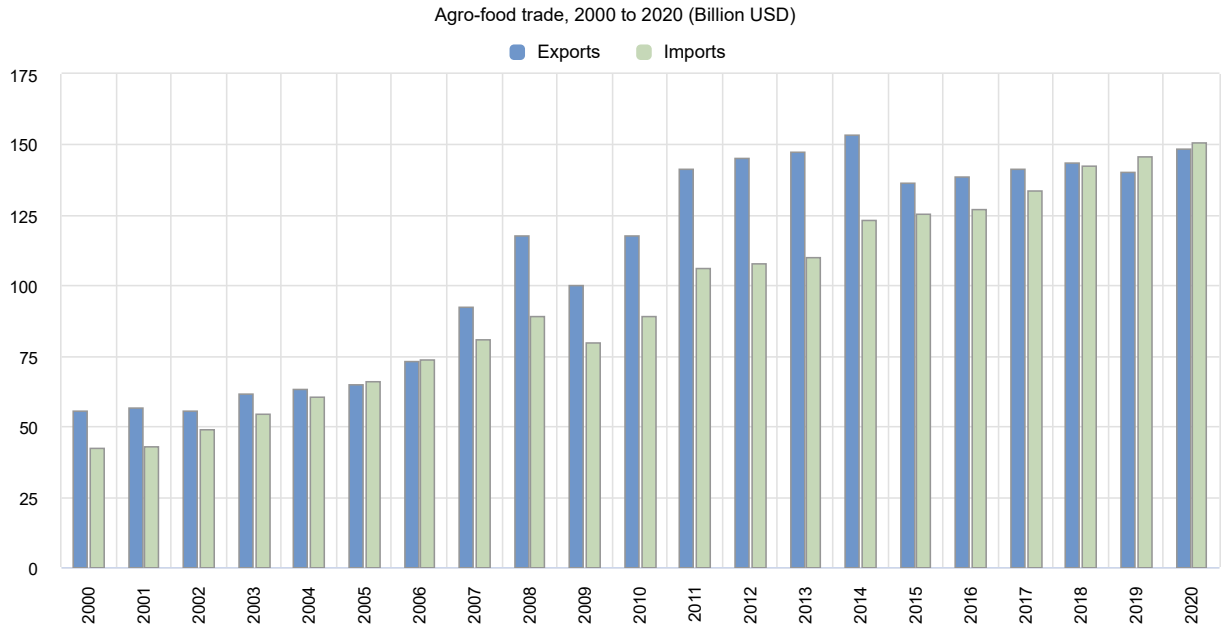
The United States is the world's second largest agricultural trader, after the European Union. Both US agricultural exports and imports have been growing steadily since 2000 and net trade is nearly balanced (Figure 29.6). Exports of high-value products such as dairy products, meats, fruit, and vegetables have been growing, driven by demand in emerging markets, though the majority of exports are still destined for further processing. Import demand on the other hand is concentrated on products for final consumption.

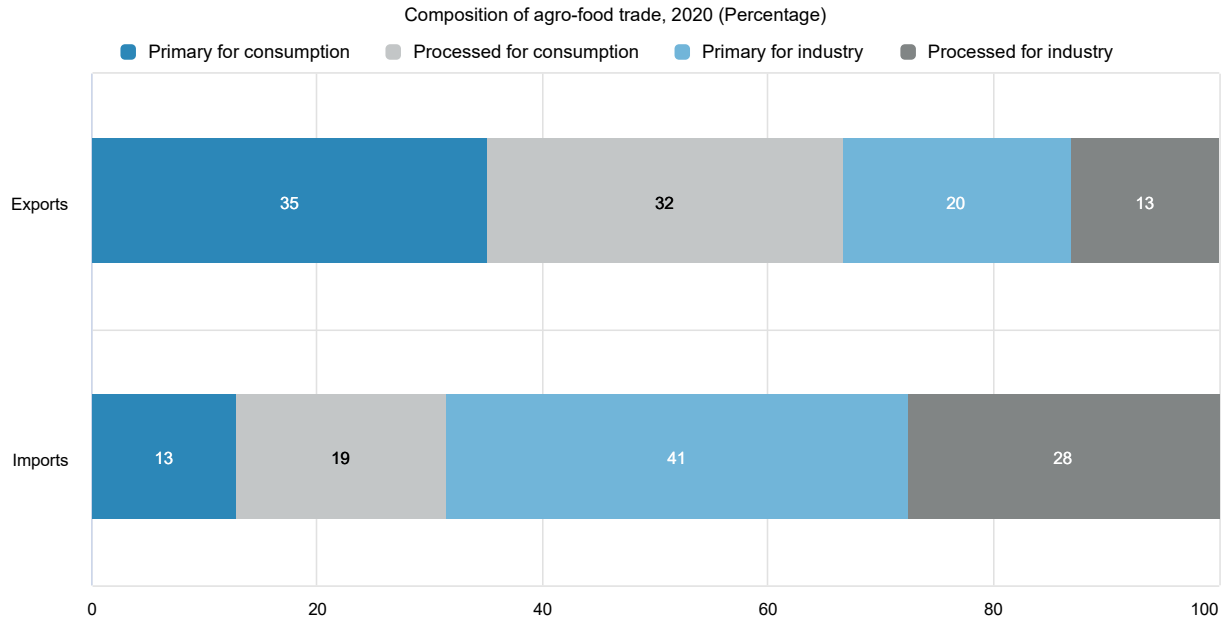
Figure 29.5. United States: Main economic indicators, 2000 to 2021



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

Figure 29.6. United States: Agro-food trade

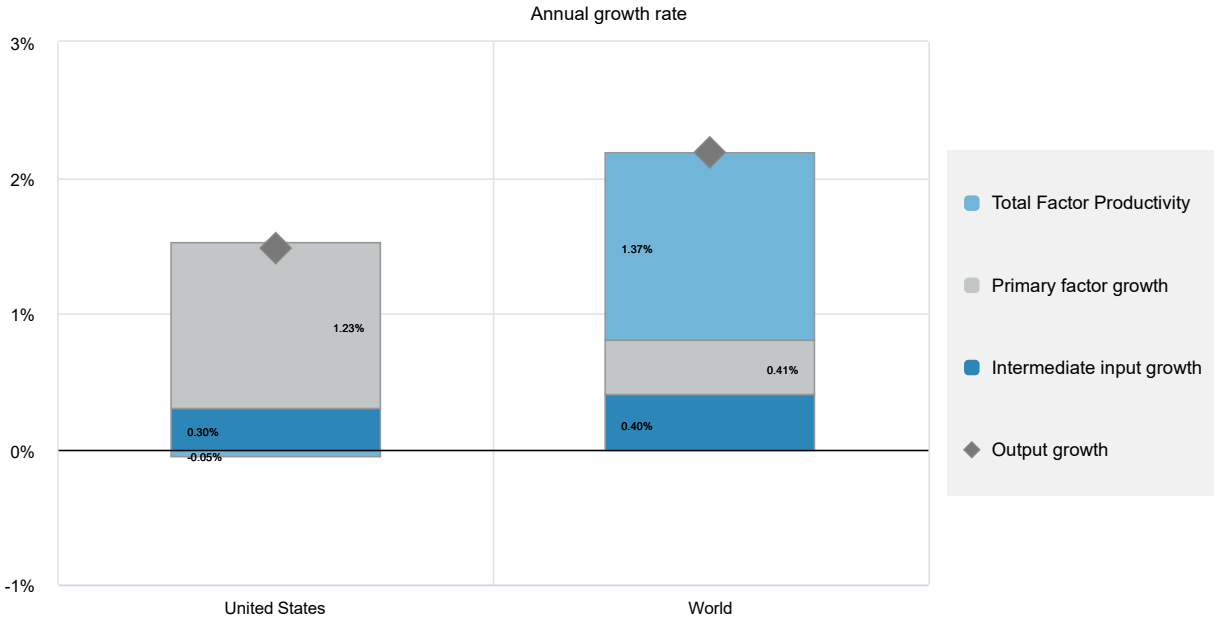




Note: Numbers may not add up to 100 due to rounding.
Source: UN Comtrade Database.

Growth in output has been driven by increases in the use of both primary factors and inputs (Figure 29.7). Total factor productivity (TFP) growth, which averaged 1.5% between 1991 and 2000, has also been an important component of growth. However, TFP growth has been close to zero over the period 2010-19. Nutrient surplus intensities at the national level are close to the average for OECD countries, with improved nitrogen balances and slightly worsening phosphorus balance (Table 29.4). Agriculture's share in energy use and share in GHG emissions are near OECD averages and increasing. However, water stress in the United States is above the OECD average. While the water stress indicator has declined between 2000 and 2020, there are regional hotspots of water stress. In particular, the southwest United States region is facing drier and warmer conditions, groundwater depletion, as well as competition for water demand from rapid population growth (OECD, 2017[10]).

Figure 29.7. United States: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land and capital (livestock and machinery). Intermediate input comprises materials (feed and fertiliser).
Source: USDA Economic Research Service Agricultural Productivity database.

Table 29.4. United States: Productivity and environmental indicators

	United States		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	1.5%	-0.1%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	34.4	30.5	32.1	30.0
Phosphorus balance, kg/ha	2.8	3.5	3.4	2.9
Agriculture share of total energy use (%)	0.9	1.3	1.7	2.0
Agriculture share of GHG emissions (%)	7.6	9.6	8.6	9.7
Share of irrigated land in AA (%)	5.3	5.6	-	-
Share of agriculture in water abstractions (%)	39.7	45.6	46.3	43.7
Water stress indicator	19.5	15.6	9.7	8.6

Note: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127).

[2] Farm Security and Rural Investment Act of 2002 (P.L. 107-171).

[3] Food, Conservation, and Energy Act of 2008 (P.L. 110-246).

[4] Agricultural Adjustment Act of 1938 (7 U.S.C. 1281).

[5] Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994. The Food, Conservation, and Energy Act of 2008 ("2008 Farm Bill") continued the 100% premium subsidy for CAT but increased CAT fees from USD 50 to USD 300/crop/county.

[6] Base acres are a farm's crop-specific historical acreage of wheat, feed grains, seed cotton, rice, oilseeds, pulse crops or peanuts eligible to participate in the ARC and PLC commodity programmes. Base acres are not linked to current plantings.

[7] Previously, cover crops could only be hayed, grazed or chopped after 1 November. Otherwise, the prevented planting payment was reduced by 65% if producers took those actions on the cover crop.

30 Viet Nam

Support to agriculture

Support to Viet Nam's agricultural sector fluctuates between low and negative levels depending on changes in market price support (MPS). In 2019-21, Viet Nam's producer support estimate (PSE) was -7.7%, implying implicit overall taxation compared to the positive level of support of 6.4% in 2000-02. MPS varies across commodities. Producers of import-competing commodities, such as maize, sugar cane and beef, benefit from tariff protection, while producers of pig and poultry meats, pepper, coffee, tea, and rubber are implicitly taxed. Effective prices received by farmers were 7% lower on average than world prices during 2019-21, though there were large differences between commodities. Rice producers benefit from domestic price support measures that seek to provide rice farmers with a 30% profit on their average production cost. However even with these measures, the price received by farmers in recent years was lower than the export reference price, resulting in a negative MPS. Budgetary transfers to producers are relatively small and dominated by payments based on variable input use – primarily expenditure to offset the irrigation fee exemption.

Support for general services for agriculture (GSSE) was equivalent to 2.4% of the value of agricultural production in 2019-21, up from 2.2% in 2000-02. Expenditure to develop and maintain infrastructure, irrigation in particular, dominates support for general services. Total support to agriculture (TSE) varies between positive and negative values because the combined value of budgetary transfers to producers and expenditure on general services does not always compensate for negative MPS.

Recent policy changes

In line with its normal planning cycle, the government issued numerous resolutions, decrees and decisions at the start of the current decade, laying out plans and targets for the next 5-10 years and beyond. Of those related to agriculture, the most important include: the Resolution on National Food Security until 2030; the Agricultural Industry Structural Plan for 2021-2025; and the Scheme for Restructuring Viet Nam's Rice Sector by 2025 and 2030. In January 2021, the Ministry of Agriculture and Rural Development (MARD) approved its plan to respond to the implementation needs set out in the 2020 National Climate Change Adaptation Plan. The plan sets out tasks to be completed by 2025 and 2030. Many involve scaling-up existing production models and techniques.

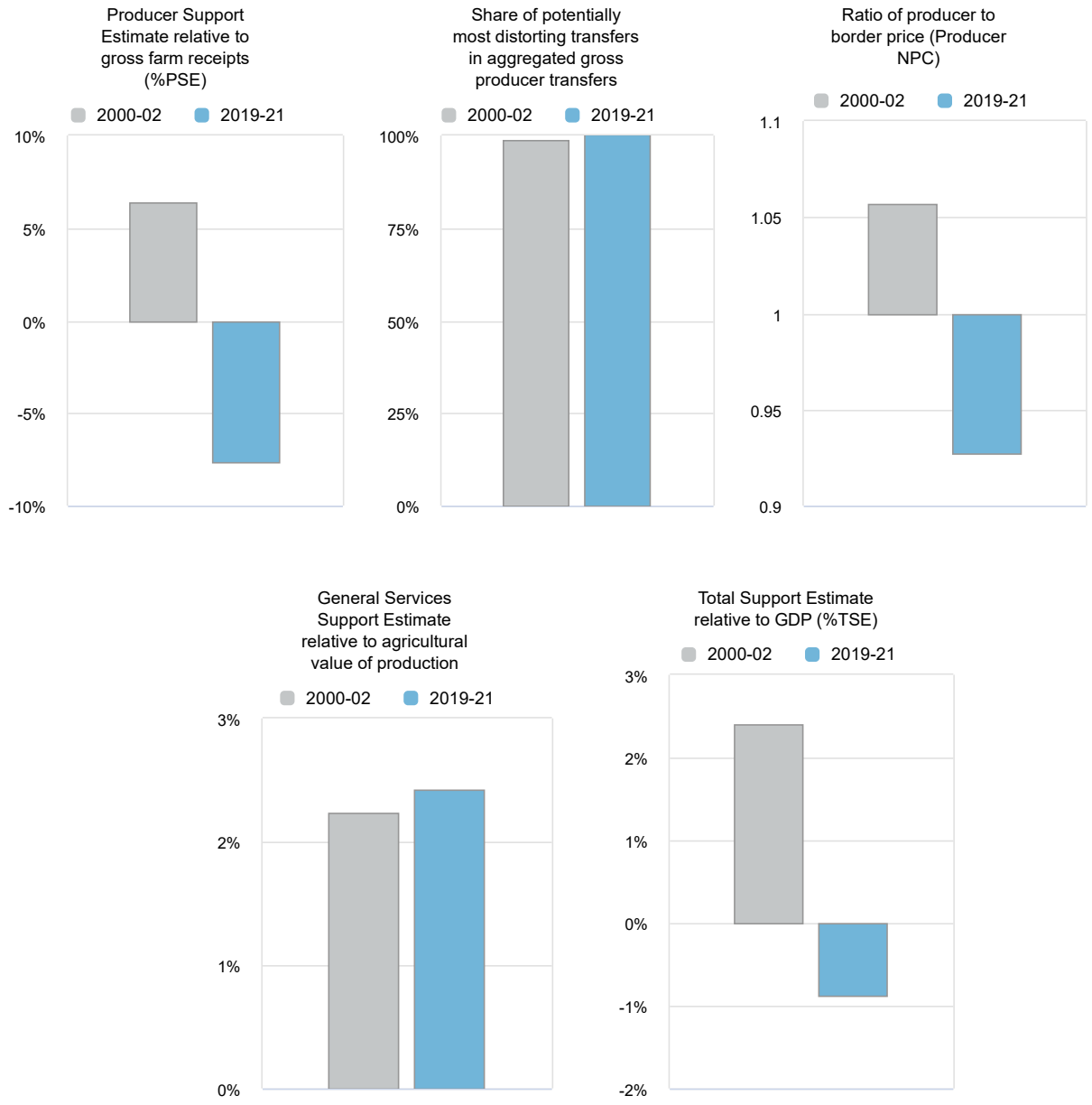
The support mechanisms introduced in 2020 to offset the impact of the COVID-19 pandemic continued in 2021. These include deferred taxation, monetary payments and concessional credit, with minor changes to improve the effectiveness of their delivery. Further, MARD established two working groups to assist with overcoming obstacles to production and distribution of products from rural areas to cities, caused by restrictions to limit the spread of the virus. Over 250 000 tonnes of rice were distributed from rice reserves in 2021, of which around one-third came from rice-exporting enterprises directed to use reserve stocks they are required to hold for such situations. Tariff reductions for selected products – e.g., wheat, maize, frozen pork and planting seeds – were also implemented to lower cost pressures.

The most significant trade development was the Regional Comprehensive Economic Partnership (RCEP), which came into effect on 1 January 2022. RCEP is the largest free trade agreement in the world, expected to unlock more export markets for Vietnamese agricultural products.

Assessment and recommendations

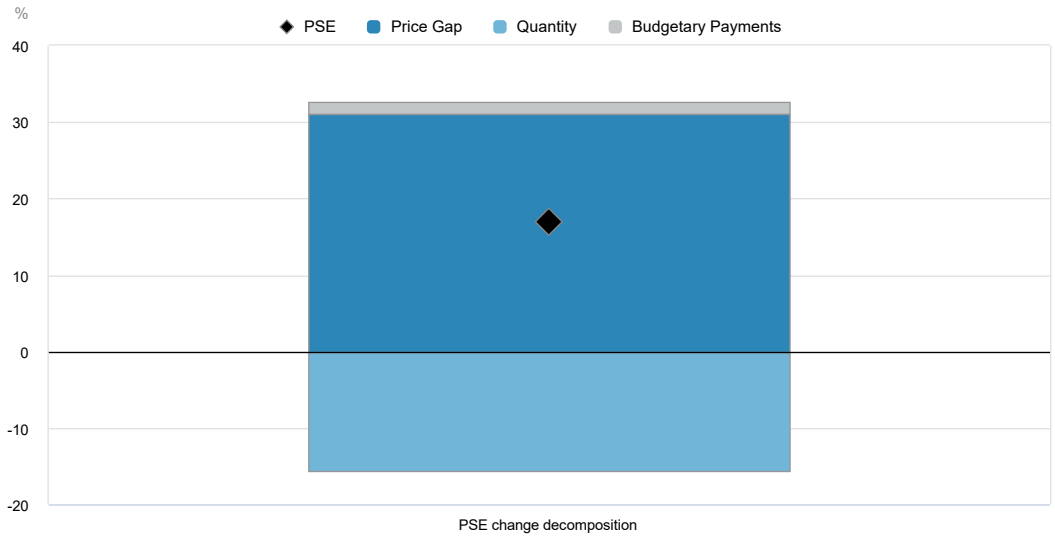
- Viet Nam made strong commitments to reduce greenhouse gas (GHG) emissions at the national level and for agriculture, which remains a significant source of emissions. At the 26th United Nations Climate Change Conference (COP26) in 2021, it committed to achieving net-zero carbon emissions by 2050. It also signed onto the Global Methane Pledge, which aims to reduce global methane emissions by at least 30% from 2020 levels by 2030. Rice cultivation is a major source of methane emissions in Viet Nam. The government also set a domestic target to reduce GHG emissions in agriculture and rural areas by 20% every 10 years. However, while Viet Nam announced many ambitious targets, few concrete steps have so far been taken. Action needs to begin soon so that the agricultural sector has time to make the structural adjustments and on-farm practice changes to meet the commitments.
- Viet Nam's integration into the global economy, including through trade agreements such as RCEP and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, brings the agricultural sector opportunities to expand and diversify exports and markets. But these agreements pose challenges to domestic producers, such as increased competition from imports as agri-food tariffs are reduced, and requirements to meet stringent food hygiene, safety and technical standards in export markets.
- Efforts are needed to improve the sector's competitiveness and environmental sustainability. Opportunities to increase production by expanding agricultural land area and using higher rates of fertilisers are fully exploited, and negative environmental impacts are increasing. While these are challenges for Viet Nam, they can create economic incentives to adopt new technologies, consolidate farms and increase the scale of production, and focus on improving quality.
- The low cost of water encourages overuse and increases the agricultural sector's vulnerability to drought. While legal requirements for re-introducing a fee for irrigation services were established, they have yet to be implemented. This would reduce the burden on the state budget and sharpen incentives to increase water productivity. Higher cost recovery would also gradually increase the budgets of irrigation management companies, which should lead to better service.
- Farm consolidation could be encouraged to improve the allocation of scarce land resources, including various forms of co-operation between farmers. In addition, restrictions on crop choice should be removed. This can help small-scale farming households connect to market opportunities and participate in value chains.
- The review of regulations controlling rice exports provides an opportunity to improve competitiveness and quality. Viet Nam has taken many steps over the past two decades to open the rice export trade to competition and these should continue as the result of the current review.

Figure 30.1. Viet Nam: Development of support to agriculture



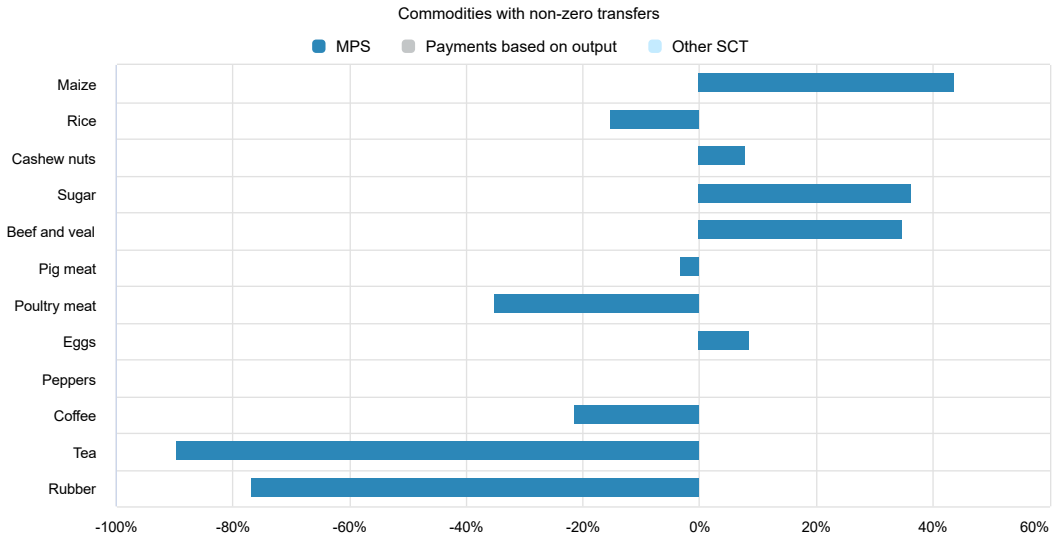
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 30.2. Viet Nam: Drivers of the change in PSE, 2020 to 2021



Note: The producer price change and the border price change are not calculated when the negative price gap occurs at the commodity level for the current or previous year.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Figure 30.3. Viet Nam: Commodity-specific transfers as a percentage of commodity gross farm receipts, 2019-21



Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Table 30.1. Viet Nam: Estimates of support to agriculture

Million USD

	2000-02	2019-21	2019	2020	2021p
Total value of production (at farm gate)	**9 013**	**45 081**	**43 790**	**44 590**	**46 862**
***of which:** share of MPS commodities (%)*	77.02	70.71	68.79	69.10	74.25
Total value of consumption (at farm gate)	**7 808**	**44 424**	**41 730**	**43 174**	**48 367**
Producer Support Estimate (PSE)	**591**	**-3 487**	**-4 315**	**-3 337**	**-2 807**
Support based on commodity output	470	-3 995	-4 773	-3 842	-3 371
Market Price Support[1]	470	-3 995	-4 773	-3 842	-3 371
Positive Market Price Support	959	1 642	1 277	1 819	1 831
Negative Market Price Support	-489	-5 638	-6 050	-5 661	-5 202
Payments based on output	0	0	0	0	0
Payments based on input use	101	507	456	502	562
Based on variable input use	101	506	456	502	561
with input constraints	0	0	0	0	0
Based on fixed capital formation	0	0	0	0	0
with input constraints	0	0	0	0	0
Based on on-farm services	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	2	2	2	2
Based on Receipts / Income	0	2	2	2	2
Based on Area planted / Animal numbers	0	0	0	0	0
with input constraints	0	0	0	0	0
Payments based on non-current A/An/R/I, production required	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0
With variable payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
With fixed payment rates	0	0	0	0	0
with commodity exceptions	0	0	0	0	0
Payments based on non-commodity criteria	21	0	0	0	0
Based on long-term resource retirement	21	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**6.35**	**-7.66**	**-9.75**	**-7.40**	**-5.92**
Producer NPC (coeff.)	**1.06**	**0.93**	**0.91**	**0.93**	**0.94**
Producer NAC (coeff.)	**1.07**	**0.93**	**0.91**	**0.93**	**0.94**
General Services Support Estimate (GSSE)	**201**	**1 090**	**988**	**1 057**	**1 226**
Agricultural knowledge and innovation system	23	139	138	147	133
Inspection and control	0	0	0	0	0
Development and maintenance of infrastructure	173	905	805	864	1 045
Marketing and promotion	0	0	0	0	0
Cost of public stockholding	5	47	45	46	49
Miscellaneous	0	0	0	0	0
Percentage GSSE (% of TSE)	**..**	**..**	**..**	**..**	**..**
Consumer Support Estimate (CSE)	**-694**	**-161**	**104**	**-39**	**-547**
Transfers to producers from consumers	-694	2 101	2 047	2 545	1 712
Other transfers from consumers	-22	-2 662	-2 322	-3 009	-2 655
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	22	399	378	425	395
Percentage CSE (%)	**-8.77**	**-0.36**	**0.25**	**-0.09**	**-1.13**
Consumer NPC (coeff.)	**1.10**	**1.01**	**1.01**	**1.01**	**1.02**
Consumer NAC (coeff.)	**1.10**	**1.00**	**1.00**	**1.00**	**1.01**
Total Support Estimate (TSE)	**793**	**-2 396**	**-3 327**	**-2 280**	**-1 581**
Transfers from consumers	716	560	274	464	942
Transfers from taxpayers	98	-295	-1 280	264	131
Budget revenues	-22	-2 662	-2 322	-3 009	-2 655
Percentage TSE (% of GDP)	**2.41**	**-0.88**	**-1.28**	**-0.84**	**-0.55**
Total Budgetary Support Estimate (TBSE)	**323**	**1 599**	**1 446**	**1 561**	**1 790**
Percentage TBSE (% of GDP)	**1.00**	**0.59**	**0.56**	**0.58**	**0.62**
GDP deflator (2000-02=100)	**100**	**405**	**403**	**408**	**..**
Exchange rate (national currency per USD)	**15 000.33**	**23 132.73**	**23 226.28**	**23 236.30**	**22 935.62**

.. Not available

Note: p: provisional. NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A/An/R/I: Area planted/Animal numbers/Receipts/Income.
1. Market Price Support (MPS) is net of producer levies and excess feed cost. MPS commodities for Viet Nam are: rice, rubber, coffee, maize, cashew nuts, sugar, pepper, tea, beef and veal, pig meat, poultry and eggs.

Source: OECD (2022), "Producer and Consumer Support Estimates", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Description of policy developments

Overview of policy trends

A long series of reforms since the late-1980s have progressively liberalised Viet Nam's agricultural sector.[1] Agricultural reforms were embedded into the economy-wide programme of reforms (*Doi Moi*) initiated in 1986, which transformed Viet Nam from a centrally planned to a socialist-oriented market economy. Prior to these reforms, agriculture's primary role was to support Viet Nam's industrialisation by providing food at low prices. Agricultural production was organised around co-operatives and state farms, with state-owned enterprises providing inputs and controlling output markets. Under the new policy framework, agriculture was elevated to primary importance. The focus of agricultural management moved from co-operatives to farm households, with farmland redistributed in the form of land use rights[2] and farm households given the ability to make their own production decisions provided they met certain quotas. Broader reforms opened the market to both greater domestic and international competition.

From the early 1990s, reforms introduced more market-oriented policies with the aim of expanding food production for export to generate foreign exchange earnings. A number of these reforms aimed to improve investment and technological innovation. These included the Land Law 1993, the establishment of a national extension service and credit facilities for farmers via increased government funding to the Vietnam Bank for Agriculture and Rural Development (VBARD). The compulsory production quota system and the agricultural output tax were replaced with a land use tax, giving farmers a greater say in marketing their production. Viet Nam also entered into many bilateral and regional trade agreements and partnerships to expand market opportunities.[3] The improved policy environment was supported by a rapid increase in budgetary expenditure, including on irrigation infrastructure. At the same time, a Price Stabilisation Fund was created to stabilise the prices of essential commodities including urea, paddy and rice, coffee, and sugarcane.

From 2000, the policy framework aimed to stimulate agricultural and rural modernisation and industrialisation by improving yields, quality and the value of production. Further international integration at the bilateral, regional and multilateral level locked in previous reforms and motivated further actions. The remaining few quantitative restrictions on agricultural imports and exports were progressively withdrawn. For example, it was not until the late 2000s that private sector involvement in the rice export trade was encouraged. Prior to this, even though the rice export quota had been expanding, from less than 1 million tonnes in 1992 to 4.5 million tonnes by 1998, the right to export was limited to national and provincial state-owned enterprises (SOEs).[4] However, even after the private sector was permitted to export rice, the government maintained a large degree of control over export activity until 2016. Exporters had to meet specific milling and storage requirements, the minimum export price had to be respected (to limit price declines), and certain administrative functions were given to the Viet Nam Food Association (VFA).

Since 2008, two major resolutions have guided agricultural policy development in Viet Nam. Resolution No. 26/NQ-TW dated 5 August 2008 (commonly referred to as the Tam Nong resolution) emphasises agricultural and rural development based on the market economy with socialist orientation. It sets broad goals of building a modern and stable agricultural sector, developing rural areas, and improving the life of rural residents.[5] Alongside this, sat government Resolution No. 63/NQ-CP dated 23 December 2009. This sought to ensure national food security by guaranteeing adequate food supplies, particularly for rice. It included specific targets of maintaining 3.8 million hectares of rice land and a farm-gate price for rice that provides growers with a profit of 30% above production costs. Resolution No. 63 was replaced by Resolution No. 34/NQ-CP dated 25 March 2021 on ensuring national food security until 2030. Like its predecessor, the overall goals of Resolution No. 34 include ensuring enough food supply for domestic consumption in all circumstances while allowing for exports, and increasing incomes of people so they can purchase good quality and safe food. The list of specific goals includes stabilising 3.5 million hectares of

land in rice production and a target that rice farmers in large-scale production areas have an average profit of 35% above production costs.

These resolutions are implemented through numerous policy documents. Two of the most important are the master plan for agricultural production development (Prime Minister's Decision No. 124/QD-TTg dated 2 February 2012) and the agricultural restructuring scheme towards value-added and sustainable (Prime Minister's Decision No. 899/QD-TTg dated 10 June 2013).[6] Both of these decisions contain general objectives to sustainably develop agriculture and rural areas; increase value-added, efficiency and competitiveness; and improve the life of farmers, contribute to poverty reduction, protect the environment and ecology, and ensure national security. The later was replaced in 2021 with a new agriculture industry structural plan for 2021-2025 (Prime Minister's Decision No. 255/QD-TTg dated 25 February 2021).

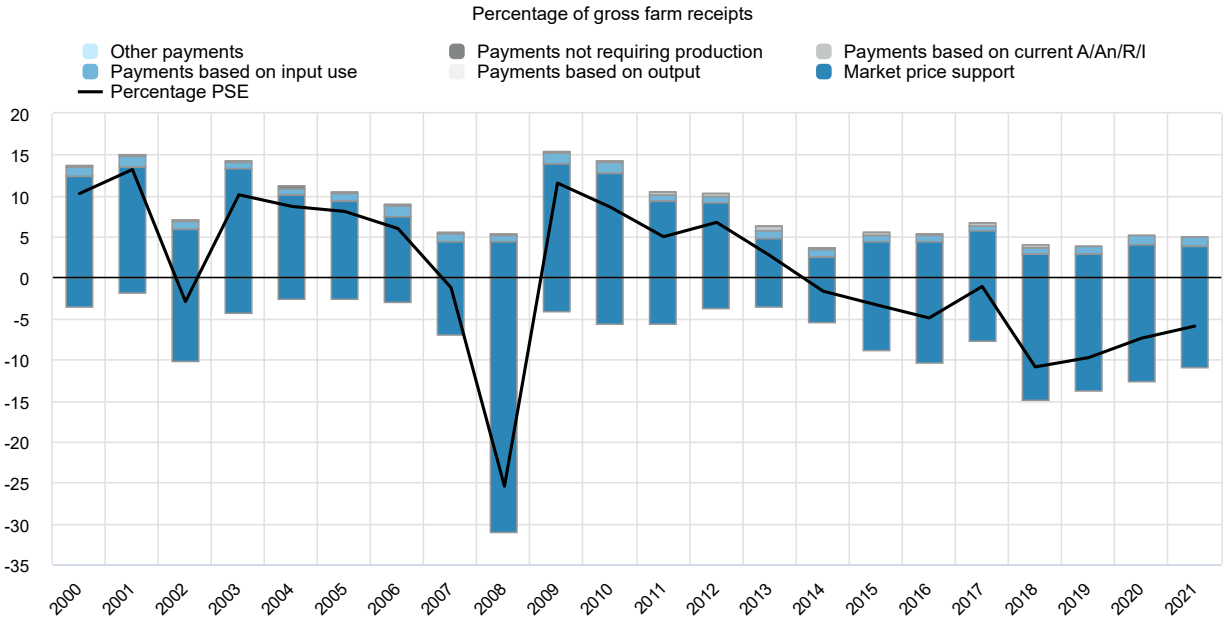
Table 30.2. Viet Nam: Agricultural policy trends

Period	Framework	Changes in agricultural policies
1976-1986	Reunification: Socialist centrally planned system	Centrally planned economy, including the agricultural sector Agricultural production organised into co-operatives that also administered land Upstream and downstream sectors reorganised as state-owned enterprises
1986-1993	Renovation (*Doi Moi*): Launch of reforms to transition Viet Nam to a socialist-oriented market economy	Farm households replace co-operatives as focus of agricultural and rural development Role of co-operatives reduced: farmers allowed to make production decisions; co-operatives limited to trading and providing services (e.g. irrigation) Economy opened to trade Reduced government control over prices, although prices regulated for some products (including fertiliser, sugar and rice)
1993-2000	Expansion: Further reforms to expand food production and exports	Land Law 1993; land use rights extended to 20 years (annual crops) and 50 years (perennial crops) Land use tax replaces production quota and agricultural output tax Rural households allowed to borrow loans from commercial institutions Price Stabilisation Fund for essential commodities Restrictions on rice exports relaxed Increased budgetary expenditure for agriculture
2000-2008	Consolidation: Policies to promote agricultural and rural modernisation and industrialisation	Policies to encourage production of primary and processed commodities, quality improvement, domestic and international trade, and increase investments from various sources in physical and social infrastructure Regional and bilateral trade agreements WTO accession
2008-present	Reorientation: Shift in emphasis from extensive development of agriculture based on quantity to one focused on quality and efficiency improvements	Agricultural policy guided by two major resolutions: - Resolution No. 26/2008/NQ-TW on agriculture, farmers and rural areas (*Tam Nong*) - Resolution No. 63/2009/NQ-CP to ensure national food security Implemented through the master plan for agricultural development (2012) and the agricultural restructuring project (2013)

Source: OECD (2015[1]).

Over the past 20 years, the overall level of support provided to Viet Nam's agricultural sector fluctuated at low or negative levels, largely driven by changes in market price support (MPS). Total support to agriculture (TSE) varies between positive and negative values, as in some years budgetary transfers to producers and expenditure on general services do not compensate for overall negative MPS.

Figure 30.4. Viet Nam: Level and PSE composition by support categories, 2000 to 2021



Notes: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2022), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-pcse-data-en.

Main policy instruments

Domestic price support is the main form of support for Vietnamese producers, with border protection being the main tool used. Domestic price support varies across commodities. Tariffs protect producers of import-competing commodities, such as beef and veal, and sugar cane. Producers of export commodities, such as natural rubber, coffee, cashew nuts and tea are implicitly taxed in that they receive prices lower than world prices for their outputs. There are two main policy instruments used in response to the objective of providing rice farmers a 30% profit above production costs. When prices are too low, the government provides concessional loans to rice purchasing enterprises for the temporary storage of rice during harvest. The government also considers this objective when it determines the annual volume and price of rice that it purchases each year to maintain its national reserve stockpile, managed by the General Department of State Reserves (GDRS) under the Ministry of Finance.[7]

Payments to producers are relatively small. Expenditure associated with **the irrigation service fee** (ISF) exemption is the dominant form of budgetary support. This exemption from paying a fee to assist with the costs of managing, maintaining and protecting irrigation works above the "canal gate" has been in place since 2009. In June 2017, a new Law on Irrigation (Law No. 08/2017/QH14) was issued, providing for the reintroduction of an ISF for all users. However, while the framework for reintroducing the ISF has been established, it has yet to be implemented.

As part the measures introduced to achieve the policy target of keeping 3.8 million hectares in paddy rice production, the government introduced for the first time in 2012 an **area payment** to rice farmers.[8] The initial payment rates of VND 500 000 (USD 22)/ha/year for land under wet paddy cultivation[9] and VND 100 000 (USD 4)/ha/year for other rice land, except upland fields not under paddy land-use plans,

were increased in 2016 to VND 1 million (USD 43)/ha/year and VND 500 000 (USD 22)/ha/year respectively.[10] In 2019, while maintaining the objective of protecting land for rice cultivation, the government replaced the direct area-based payments with increased funding for local rice grower support programmes at the provincial level.[11] At least 50% of this funding is to be used to support the adoption of new rice varieties, new technologies in rice production, and to promote value chain linkages for the production and sale of rice. Remaining funds are to be used for activities such as periodic soil analyses to guide restoration measures, improving land quality, and investments in agricultural and rural infrastructure. Local authorities can determine the form of support provided based on local needs. Detailed information on how funding is being spent is presently unavailable, but it is being used to maintain irrigation systems.

Support programmes based on **input use** include those that provide plant genetic and animal breeding material to farmers at subsidised rates. At the national level, these are often part of a package for farmers recovering from natural disasters or disease outbreaks. Payments to farmers following natural disasters and epidemics are set by the government under Decree No. 02/2017/ND-CP dated 9 January 2017. For example, in response to African swine fever in 2019-2020, which reduced the national pig herd by more than 20%, the government provided financial support to compensate producers for animals that had to be culled. Since 2009, several policy packages were introduced to provide farmers subsidised credit to purchase inputs and assets for agricultural production (fertilisers, pesticides, machinery and equipment).

Since 2003, most farming households and organisations are exempt from paying agricultural **land use tax** or benefit from a land tax reduction. The exemptions and reductions were initially provided for a seven-year period but were extended in 2010 for a further ten-year period to the end of 2020.[12] In June 2020, the government extended the exemption for a further five-years out to 31 December 2025 (Resolution No. 107/2020/QH14).

Expenditures on **irrigation systems** dominate general services for the agricultural sector. In January 2020 the government approved Viet Nam's irrigation strategy to 2030, with a vision to 2045 (Decision No. 33/2020/QD-TTg). The strategy establishes water supply targets for agricultural production and aquaculture, among other objectives, such as ensuring the supply of water for double-cropping paddy rice fields, and ensuring that 85% of the total area is under irrigation. By 2030, 30% of the total area should be cultivated with advanced methods, and 60% by 2050. Other targets in the irrigation strategy are improving drainage and environmental protection, and preventing and combating natural disasters, and responding to climate change, including by responding to drought, saltwater intrusion, floods, and riverbank and coastal erosion. Targets in the strategy will be achieved through a combination of investments in irrigation infrastructure, improved planning and management of irrigation laws, and technical solutions.

Expenditures on **other general services** include investments on infrastructure provided through rural development Programme 135, agricultural knowledge and innovation systems, inspection and control, marketing and promotion, and public stockholding. The government approved the research and development programme for plant and livestock varieties serving agricultural restructuring for the period 2021-30 (Decision No. 703/QD-TTg dated 28 May 2020). The programme aims to improve research capacity and the production of agricultural plant and livestock varieties to support the modernisation of the agricultural sector, adaptation to climate change, and the restructuring of agricultural production to improve competitiveness, increase value-added and promote sustainable development. Total investment in the programme is VND 103 050 billion (USD 4.4 billion) over the period 2021-30, including private funding.

All land is owned and administered by the state on behalf of the people. Farmers have **land user rights**, and benefit from a wide range of rights, including the right to rent, buy, sell and bequeath land, and to use land as collateral for mortgages with financial institutions. However, there are restrictions on land use including the duration of land use rights, the choice of crops, the process for converting paddy land from rice to another crop, and land transfers and exchanges. Agricultural land use plans and support policies favour rice production.

Viet Nam launched the *National Adaption Plan in Agriculture* (NAP-Ag) in 2016 with the primary objective of identifying entry points for mainstreaming **climate change adaption** priorities for the agricultural sector.[13] As part of NAP-Ag, a climate change vulnerability assessment was carried out in the agricultural sector (crop, livestock and aquaculture) together with a stocktake of climate change adaption measures and CSA practices in use in the sector. A salinity monitoring and early warning system was also piloted in some provinces of the Mekong River Delta (MRD) to keep farmers informed about salinity levels. A pilot mapping of landslide disaster risk was carried out in 13 mountainous provinces, and scaled-out to the whole country in 2018. Further, to successfully integrate adaptation priorities in the NAP-Ag, the capacities of MARD officials and other stakeholders in the agriculture sector were built through rapid capacity assessments, the formation of a Technical Working Group within MARD, the development of guidelines on prioritizing climate-responsive investments (especially in the Mekong Delta) and trainings for national and provincial officials on valuation of climate change impacts (FAO and UNDP, 2020[2]). In 2020, the Prime Minister approved VND 530 billion (USD 22.8 million) in financial support to prevent and combat drought, water shortages and salinisation in eight provinces in the MRD, including the impacts on agriculture (Decision No. 504/QD-TTg dated 10 April 2020). The funding will be used to implement urgent measures such as pumping water; dredging canals and ditches, and building temporary dams to prevent salinity to maintain fresh water; and digging ponds and wells for storing fresh water.

In January 2017, in line with the Investment Law of 2014, Viet Nam's Ministry of Industry and Trade (MOIT) abolished Decision No. 6139/2013/QD-BCT, which capped the number of rice exporters at 150 and stipulated strict conditions for becoming a rice exporter. The government further relaxed **export conditions on rice** through Decree No. 107/ND-CP dated 15 August 2018.[14] To obtain a certificate to export rice from MOIT under the new Decree, companies must now have at least one storage and one milling facility that meet national standards and regulations, which can be owned or leased, and maintain rice reserves equivalent to 5% of the volume shipped in the preceding six months.[15] Decree 107 also removed the requirement to register export contracts and the regulations on setting minimum export prices.

Following Viet Nam's accession to the WTO in 2007, the simple **average Most Favoured Nation (MFN)-applied tariff** on agricultural imports decreased from around 25% in the mid-2000s to 16.5% in 2020. This is slightly lower than the simple average bound tariff on agricultural products of 18.8%. But it is almost double the simple average MFN applied tariff on non-agricultural goods of 8.4% (WTO, 2021[3]). Applied tariffs are much lower on imports originating from countries or regions with which Viet Nam signed free trade agreements. For example, the simple average preferential tariff on agricultural imports is just 2.3% from ASEAN members and the People's Republic of China (hereafter "China"), and 4.5% from Australia and New Zealand.

Since joining the World Trade Organization (WTO) in 2007, Viet Nam has progressed towards implementing the requirements of the **Sanitary and Phytosanitary Agreement**. However, the regulatory regime still suffers from limited enforcement capacity, poor co-ordination and many overlapping regulations.

Viet Nam implements **trade liberalisation** through multilateral, regional and bilateral trade agreements. It is a member of the WTO, Association of Southeast Asian Nations (ASEAN) and Asia-Pacific Economic Cooperation (APEC), and supports trade liberalisation between ASEAN members and their major trading partners in the region, including China, Japan, India, Korea, Australia and New Zealand. Outside of ASEAN, Viet Nam has negotiated bilateral free trade agreements with Chile, Cuba, the Eurasian Economic Union, the European Union, Japan, Korea, and the United Kingdom, with the agreements with the European Union and the United Kingdom coming into effect in 2020. Viet Nam, along with ten other countries, signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) on 8 March 2018.[16] The agreement was ratified by the Vietnamese National Assembly on 12 November 2018, and entered into force on 14 January 2019.

Climate change mitigation policies in agriculture

The agricultural sector accounts for almost one-third of Viet Nam's GHG emissions (Table 30.4). Viet Nam signed and ratified the Paris Agreement on Climate Change in 2016. Its initial Nationally Determined Contribution (NDC) submitted in 2015 committed to reducing estimated 2030 business-as-usual (BAU) GHG emissions of 787.4 $MtCO_2eq$ by 8% using domestic resources, and up to 25% conditional on receiving international support. In the updated NDC Viet Nam submitted in July 2020 (Government of Viet Nam, 2020[4]), the 2030 BAU GHG emission level was revised up 18% to 927.9 $MtCO_2eq$, with the commitment made to reduce this level by 9% using domestic resources and up to 27% with international support.[17] Consequently the new 2030 commitment level is 17% higher than that set in 2015 (844 $MtCO_2eq$ compared to 724 $MtCO_2eq$).

At COP26, Viet Nam committed to achieving net-zero carbon emissions by 2050. In addition, Viet Nam signed onto the Global Methane Pledge, which aims to reduce global methane emissions by at least 30% from 2020 levels by 2030. As rice cultivation is identified as a major source of GHG emissions, particularly methane, Viet Nam is actively looking into solutions for emission reductions in this sector. Viet Nam also committed to ending deforestation by 2030 in signing the Glasgow Leaders' Declaration on Forest and Land Use.

The National Strategy for Climate Change was approved in 2011 (Decision No. 2139/QD-TTg dated 5 December 2011). The strategy tasks the agricultural sector with reducing GHG emissions by 20% every ten years while increasing gross production by 20% and reducing the poverty rate by 20%. The National Strategy on Green Growth for 2021-30, with a vision to 2050, sets the goal of a green and carbon-neutral economy that contributes to limiting global warming (Decision No. 1658/QD-TTg dated 1 October 2021). To reduce the intensity of GHG emissions per GDP (target reductions of at least 15% compared to 2014 levels by 2030 and 30% by 2050), the agricultural sector's targets are to maintain forest cover at 42% to 2030 and 42-43% to 2050, and apply advanced and water-saving irrigation methods to 30% of total irrigated dry crop area by 2030 and 60% by 2050.

In March 2020, MARD approved its Plan to Implement the Paris Agreement on Climate Change for 2021-30.[18] It sets out MARD's plan in detail for undertaking the 41 compulsory, prioritised or encouraged tasks for the sector as per the government's 2016 action plan to implement the Paris Agreement (Decision No. 2053/QD-TTg dated 28 October 2016). Key tasks for MARD include reducing GHG emissions in the agriculture and rural development sector, and establishing measurement, reporting and verification systems (MRV) for the agricultural sector and the land use, land use change and forestry (LULUCF) sectors. To reduce GHG emissions in agriculture and rural areas by 20%, these plans and programmes prioritise research on selection and production of plant varieties and animal breeds able to minimise GHG emissions and adapt to climate change, and the adoption of more sustainable practices and climate smart agriculture techniques. Actions to implement the tasks include: human resources training and capacity building; reviewing and adjusting mechanisms, policies, and sectoral plans in accordance with the Paris Agreement on Climate Change; applying scientific and technological solutions; international co-operation; and mobilising financial resources, including in the form of public-private partnerships with domestic and foreign businesses.

In the same month, the Prime Minister approved the Master Programme on Sustainable Agricultural Development and Adaptation to Climate Change in the Mekong River Delta (MRD) to 2030, with a vision to 2045 (Decision No. 324/QD-TTg dated 2 March 2020). The Master Programme establishes economic, social and environmental targets for the agricultural and rural sector in the MRD, and actions to achieve those targets. Among them is a goal to reduce GHG emissions from agriculture in the region by 20% compared to 2010. Actions include: reviewing and adjusting regional and provincial development plans towards sustainable transformation and climate change adaptation; the application of science and technology; and capacity-building for natural resource and environmental management.

Domestic policy developments in 2021-22

In line with its normal planning cycle, the government has issued numerous resolutions, decrees and decisions at the start of the decade outlying plans and targets for the next 5-10 years, and beyond. Some of the important high-level ones issued in 2021-22 that have implications for the agricultural sector include:

- The 5-year Socio-Economic Development Plan (SEDP) for 2021-25 – sets national level economic, social and environmental targets, including for productivity growth, poverty reduction, waste collection, etc. (Resolution No: 16/QH15 of the National Assembly dated 27 July 2021).
- The resolution on ensuring national food security until 2030 – includes a specific target of maintaining 3.5 million hectares for rice cultivation and producing an annual total of at least 35 million tonnes of rice (Resolution No. 34/NQ-CP of the Government dated 25 March 2021).
- The national scheme for high-tech development by 2030 – includes a specific target of 200 agricultural high-tech enterprises (Decision No. 130/QD-TTg of the Prime Minister dated 7 January 2021).
- The national strategy for disaster prevention and response to 2030, with vision to 2050 – sets targets to reduce damage caused by natural disasters such as death tolls and economic losses (Decision No. 379/QD-TTg of the Prime Minister dated 17 March 2021).
- The scheme for increasing community awareness and community-based disaster risk management by 2030 – sets targets for the provision of information and the development of plans for different groups (Decision No. 553/QD-TTg of the Prime Minister dated 6 April 2021).

Those specifically relating to agriculture include:

- The national land use master plan for 2021-30, vision to 2050 – sets the requirements of maintaining 3.5 million hectares of paddy land and ensure forest cover of 42-43% out to 2030 (Resolution No. 39/QH15 of the National Assembly dated 13 November 2021).
- The agricultural industry structural plan for 2021-25 – sets specific goals for the agricultural sector (such as achieving an average annual value-added growth of 2.5-3%), and specific land area and production targets for key national product groups, e.g. reduce the area in coffee to 670 000 ha and achieve annual output of 1.8-1.9 million tonnes (Decision No. 255/OQ-TTg of the Prime Minister dated 25 February 2021).
- The scheme for agricultural biotechnology development by 2030 – involving the mastering of new-generation biotechnologies, a 30% increase in the number of bio-industrial enterprises in agriculture, support for infrastructure capacity, and training of human resources (Decision No. 429/QD-TTg of the Prime Minister dated 24 March 2021).
- The scheme for restructuring Viet Nam's rice sector by 2025 and 2030 – sets specific objectives such as maintaining 3.6-3.7 million hectares in paddy production by 2025 (3.5 million hectares by 2030), ensuring annual rice production of 40-41 million tonnes by 2025 (at least 35 million tonnes by 2030); reduce use of chemical fertilisers and agrochemicals in rice production by at least 30% by 2025 (40% by 2030); reduce GHG emission in rice production by 5% by 2025 (10% by 2030); and ensure that farmers receive at least a 30% profit (both 2025 and 2030) (Decision No. 555/QD-BNN-TT of MARD dated 26 January 2021).

Policies to **support the uptake of insurance** by agricultural producers have continued to be adopted. While the eligibility period for premium subsidies was initially available from 26 June 2019 to 31 December 2020, it was extended to the end of 2021 by Decision No. 03/2021/QD-TTg dated 25 January 2021. Individuals engaged in rice, cattle and aquaculture production in specified provinces and centrally run cities receive subsidies for insurance premiums of up to 90% for those classified as being in or near poverty and up to 20% for all others. In addition to subsidies, other work is being carried to boost farmer demand and uptake through education and awareness raising. For example, the International Fund for Agricultural

Development (IFAD) is working in partnership with the government to provide training for trainers and farm-friendly teaching materials covering the basics of how insurance works.[19]

On **agricultural regulation**, a ban on the use of crop protection products containing glyphosate came into effect on 1 July 2021. Originally announced in 2019 to take effect from 1 July 2020, a one-year extension for the commencement of the ban had been provided in June 2020.

In January 2021 MARD approved its plan to respond to the implementation needs set out in the 2020 National **Climate Change Adaptation** Plan.[20] The plan sets out various tasks to be completed by 2025 and 2030. For example, one of the tasks to improve resilience of the agricultural sector is to reform support mechanism and policies on land, finance and techniques for enterprises engaged in the development of large-scale agricultural adaption models. Many tasks involve scaling-up the use of existing models and techniques.

Domestic policy responses to the COVID-19 pandemic

During 2021, the government continued to use a range of measures to contain the spread of COVID-19, including the closure of borders, social distancing orders; the closures of schools, food service enterprises, and wholesale and wet markets; restrictions on movements; and the scaling down or shutdown of industrial parks, export processing zones, and livestock slaughtering and processing facilities. Consequently, the support mechanisms introduced in 2020 to help alleviate the impact of these measures on business, including deferred taxation, monetary payments and concessional credit, continued in 2021.

For example, the ability for enterprises, individuals and household businesses affected by the COVID-19 pandemic to defer payment of value added tax, corporate income tax, personal income tax, and land rental fees was extended in 2021.[21] Enterprises, organisations, households and individuals engaged in agricultural, forestry and fishery production, and food production and processing, are among the subjects that are eligible to defer payments of tax and land rent.

Similarly, the provision of monetary payments to household businesses, employers and employees, including enterprises engaged in agricultural production, food production or processing, introduced in 2020,[22] were modified in 2021 to make it easier to access the payments.[23] Due to administrative difficulties encountered in accessing the payment, not all the budget allocation was distributed in 2020. As a further measure, the government has enabled employers impacted by the epidemic to both access unemployment benefits from and reduce their contribution rate to the Unemployment Insurance Fund.[24]

Concessional credit measures continued in 2021. These include an interest-free loan facility at the State Bank of Viet Nam (SBV) to assist businesses pay wages during periods when lockdown restrictions prevented employees working, and support to credit institutions and foreign bank branches to restructure debt repayment terms, exempt or reduce interest and fees.[25] Total borrowings of the agricultural and rural areas reached more than VND 2.5 million billion (USD 108 billion) towards the end of 2021, up more than 10% on a year earlier. This includes both commercial loans and low interest rate borrowings from the Bank of Social Policies.

Viet Nam also used its state reserve system, managed by the GDSR, to respond to the pandemic. Each year the GSDR purchases between 150-300 000 tonnes of rice. In 2020, Viet Nam purchased 270 000 tonnes of rice, including 80 000 tonnes of paddy (unhusked) rice, to ensure domestic food availability during the COVID-19 pandemic. During 2021, over 250 000 tonnes of rice was distributed from rice reserves, of which 75 413 tonnes came from rice exporting enterprises who were directed to distribute this from the reserve stocks they are required to hold for such an occasion. The government announced in September 2021 that it will purchase an additional 172 900 tonnes to rice for the national reserve.

In July 2021 MARD established two working groups – one for the north and one for the south – to assist with overcoming the obstacles to production, harvest, transportation and distribution of product from the rural areas into the cities caused by COVID-19 restrictions. The working groups co-ordinated activities with

other ministries, local governments, industries, businesses and cooperatives. COVID-19 has accelerated the use of digital platforms to connect suppliers and customers, and strengthened the linkages along the marketing chain.

Trade policy developments in 2021-22

On 15 November 2020, Viet Nam along with its nine other ASEAN partners and five other regional states with which ASEAN has existing free trade agreements signed the **Regional Comprehensive Economic Partnership (RCEP or ASEAN+5)**.[26] The RCEP primarily focuses on the regulations for market entry and investment, combining and deepening the existing ASEAN agreements. By early December 2021, six of the ten ASEAN signatories, including Viet Nam, and all five non-ASEAN signatories had ratified the agreement meaning that the trade pact took effect on 1 January 2022 for most members. RCEP is the largest free trade agreement in the world, covering around 30% of both global population and GDP. Seven of the 15 RCEP signatories, including Viet Nam, are intersection economies also belonging to the 11-member **Comprehensive and Progressive Agreement for Trans-Pacific Partnership** (CPTPP).

RCEP and CPTPP are expected to unlock more export markets for Vietnamese agricultural products. In additional to improved access for tropical agricultural products and processed foods, export opportunities will be enhanced by a simplification of import and export procedures and more consistent rules of origin. MARD is working closely with MOIT to organise trade promotional missions to key export markets. It is also negotiating with its regulatory counterparts to remove technical barriers for Vietnamese agricultural products, especially fruits. COVID-19 restrictions have also created difficulties transporting agricultural exports across land borders. At the end of 2021, a record 5 000 or so container trucks carrying agricultural products were waiting at the northern border gates of Lang Son and Mong Chai to enter China.

MOIT is currently consulting on amending and supplementing Decree No. 107/2018/ND-CP which controls businesses involved in rice exports. This may amend requirements on business to own or lease minimum sized rice storage and processing facilities.

Trade policy responses to the COVID-19 pandemic

In response to rising prices as consumers stockpiled rice in response to the COVID-19 outbreak and impending lockdown, and in the context of a severe drought in the Mekong River Delta, the government announced in late March 2020 that it would not permit any new rice export contracts to be signed (FAO, 2021[5]). At the same time, rice traders were ordered to release their reserves onto the domestic market. However, the decision to suspend new rice export contracts was revised on 3 April 2020 in favour of a monthly 400 000 (revised up to 500 000) tonne export quota, allocated on a first-come, first-served basis. Furthermore, in late April it was declared that rice exports would resume unrestricted as of 1 May 2020.

Tariff reductions have been implemented to lower cost pressures. Most Favoured Nation (MFN) tariff reductions for wheat, maize, frozen pork and planting seeds were provided for in Decree No. 101/2021/ND-CP of 15 November 2021. This followed similar decisions in 2020 to reduce tariff rates on dairy products, ethanol, almonds, apples, grapes, wheat, walnuts, frozen potatoes, raisins, and chilled and frozen pork.

Contextual information

Viet Nam is a mid-size country in terms of area, but its population of over 96 million makes it the 15th most populous country in the world (Table 30.3). Almost two-thirds of the population live in rural areas. Since the mid-1980s, a long series of reforms have moved the economy, including the agricultural sector, in the direction of open markets for trade and investment, private sector decision-making, private land use rights, and a greater role for private firms. These reforms resulted in rapid, stable and inclusive economic growth, transforming Viet Nam from one of the world's poorest nations to a lower middle-income country, and

contributing to significant reductions in poverty rates and improvements in other social outcomes, including in rural areas. Viet Nam's economic growth over the past 20 years has been remarkably strong and steady (Figure 30.5). Due to the impact of COVID-19, real GDP growth slowed in 2020 to just under 3%, marking the first time that annual growth has been below 5% in more than two decades.

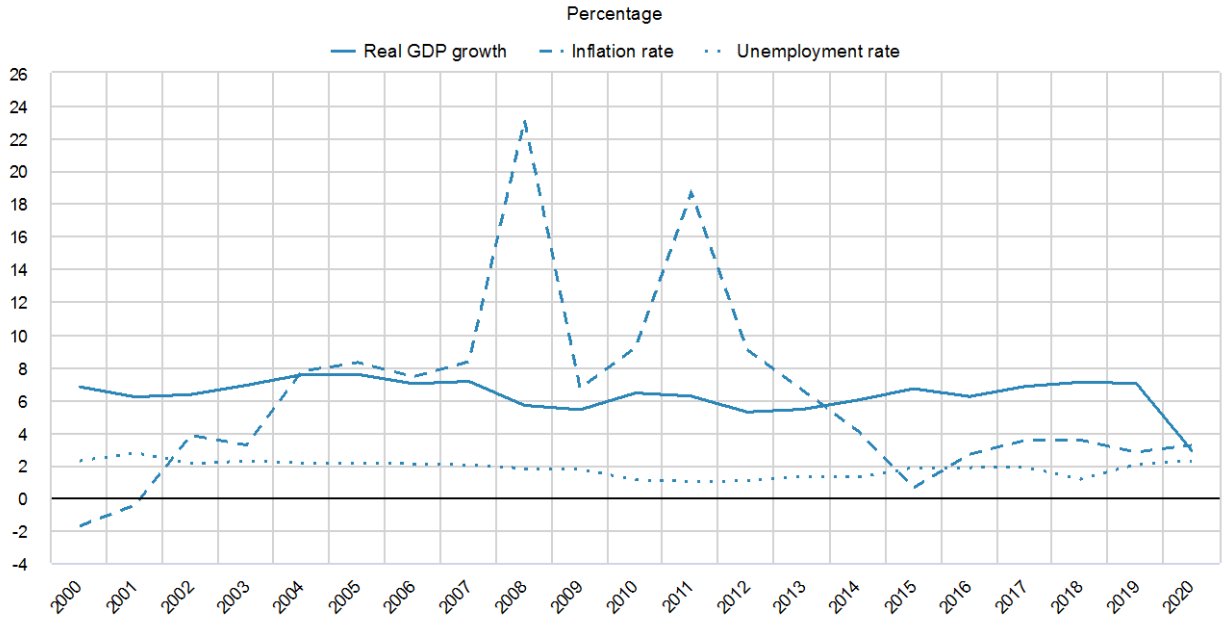
The agricultural sector in Viet Nam has undergone significant structural changes in recent decades, reflecting a shift away from staple foods to export commodities, in particular perennial crops such as rubber and cashew nuts, and to livestock production, particularly pig meat, in response to increased domestic demand. Nevertheless, crops dominate with rice accounting for around 26% of the value of agricultural production. Agricultural production has more than tripled in volume since 1990. While the relative importance of agriculture in the economy has declined over time, agriculture remains an important sector, contributing 14% to Viet Nam's GDP, employing 37% of the labour force, and is the largest source of income for a significant share of rural households.

Table 30.3. Viet Nam: Contextual indicators

	Viet Nam		International comparison	
	2000*	2020*	2000*	2020*
Economic context			**Share in total of all countries**	
GDP (billion USD in PPPs)	159	842	0.4%	0.8%
Population (million)	80	97	1.9%	1.9%
Land area (thousand km²)	310	313	0.4%	0.4%
Agricultural area (AA) (thousand ha)	8 780	12 388	0.3%	0.4%
			All countries[1]	
Population density (inhabitants/km²)	258	314	53	63
GDP per capita (USD in PPPs)	1 987	8 651	9 281	20 929
Trade as % of GDP	49	100	12.3	14.0
Agriculture in the economy			**All countries[1]**	
Agriculture in GDP (%)	22.7	14.9	2.9	4.9
Agriculture share in employment (%)	65.3	36.2	-	-
Agro-food exports (% of total exports)	16.9	6.6	6.2	8.5
Agro-food imports (% of total imports)	6.1	8.6	5.5	7.7
Characteristics of the agricultural sector			**All countries[1]**	
Crop in total agricultural production (%)	78	66	-	-
Livestock in total agricultural production (%)	22	34	-	-
Share of arable land in AA (%)	71	55	32	34

Notes: *or closest available year. 1. Average of all countries covered in this report. Agro-food trade includes natural rubber.
Sources: OECD statistical databases; UN Comtrade; World Bank, WDI and national data.

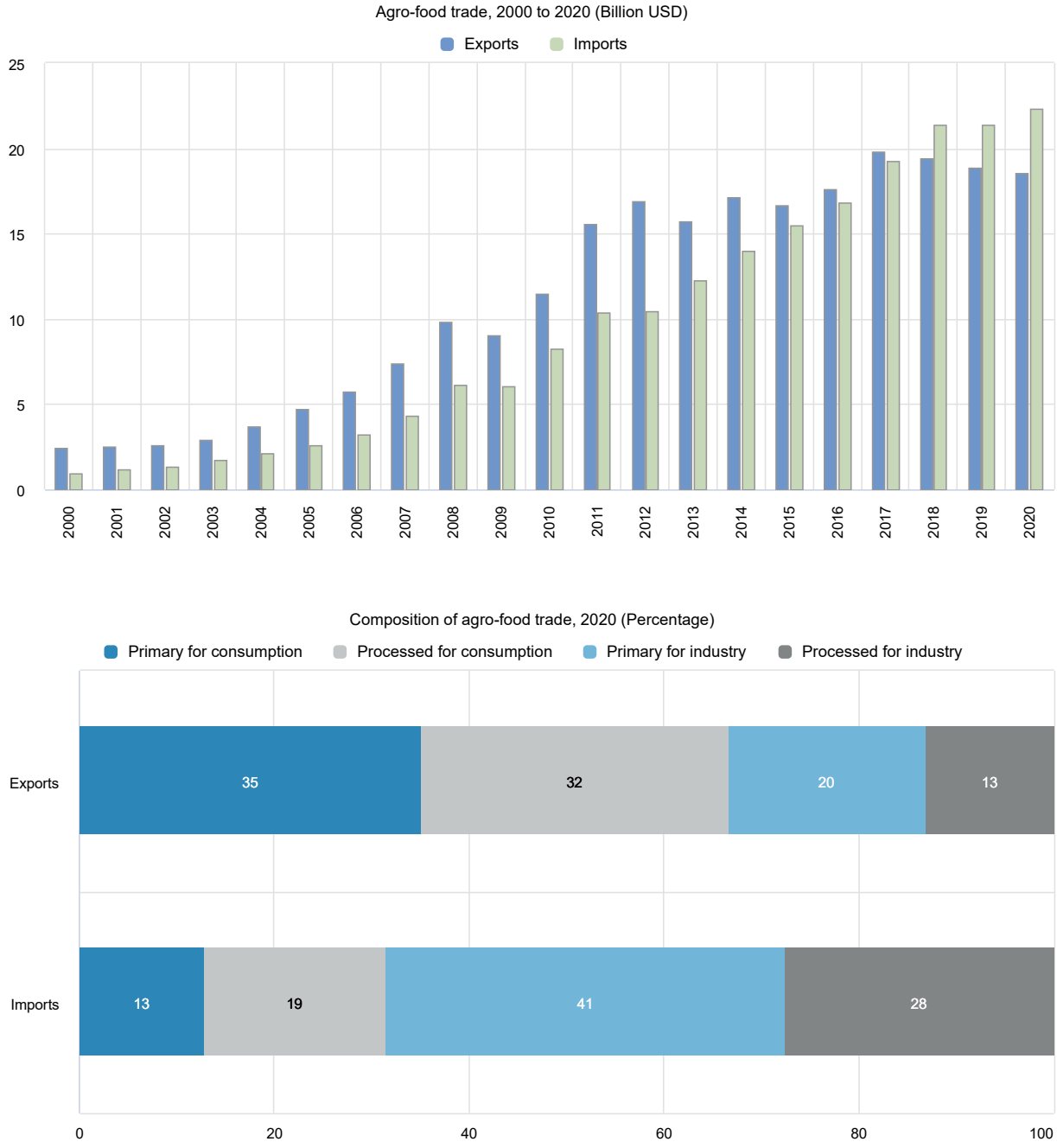
Figure 30.5. Viet Nam: Main economic indicators, 2000 to 2020



Sources: OECD statistical databases; World Bank, WDI; and ILO estimates and projections.

The agro-food sector is well integrated with international markets (Figure 30.6). Agro-food exports have increased eight-fold since the early 2000s. Viet Nam is now one of the world's largest exporters of a wide range of agricultural commodities, including rice, coffee, tea, cashew nuts, coffee, black pepper, natural rubber, and cassava. However, exports often sell at a discount compared with the same commodities from other leading exporters due to quality differences. Two-thirds of Viet Nam's agro-food exports are delivered for household consumption without further processing in the export market. Agro-food imports have also increased significantly and since 2018 now exceed agro-food exports in value terms. Around two-thirds of agro-food imports are used as inputs into production rather than for household consumption. Key imports into production include livestock feedstuffs such as oil cake and maize (about 90% percent of animal feed ingredients are imported), and raw commodities for further processing and export like cotton and cashew nuts. The remaining one-third are products to meet food demand from domestic consumers, including for higher value foods and beverages.

Figure 30.6. Viet Nam: Agro-food trade

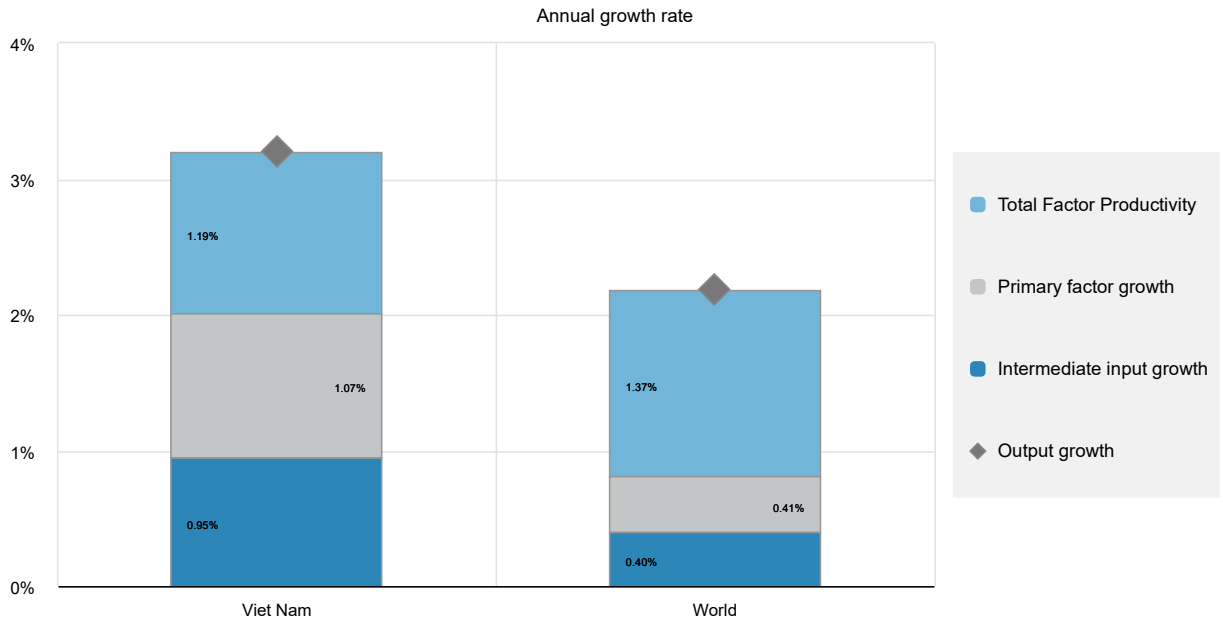


Note: Numbers may not add up to 100 due to rounding. Agro-food trade includes natural rubber.
Source: UN Comtrade Database.

Agricultural production increased by 3.2% p.a. on average between 2010 and 2019, driven by total factor productivity growth, which was slightly below the global average at 1.2% p.a., and greater use of primary factors and intermediate inputs (Figure 30.7). However, agriculture places significant and growing pressure on natural resources. Excessive use of fertilisers, pesticides and other chemicals has contributed to a gradual degradation of water and land quality (Table 30.4). This, together with the impact of climate

change, poses a significant risk to agricultural production and the capacity of the sector to maintain productivity and output growth.

Figure 30.7. Viet Nam: Composition of agricultural output growth, 2010-19



Note: Primary factors comprise labour, land, livestock and machinery.
Source: USDA Economic Research Service Agricultural Productivity database.

Table 30.4. Viet Nam: Productivity and environmental indicators

	Viet Nam		International comparison	
	1991-2000	2010-2019	1991-2000	2010-2019
			World	
TFP annual growth rate (%)	2.3%	1.2%	1.7%	1.4%
			OECD average	
Environmental indicators	**2000***	**2020***	**2000***	**2020***
Nitrogen balance, kg/ha	165.6	126.5	32.1	30.0
Phosphorus balance, kg/ha	29.9	31.9	3.4	2.9
Agriculture share of total energy use (%)	1.7	2.1	1.7	2.0
Agriculture share of GHG emissions (%)	47.9	31.6	8.6	9.7
Share of irrigated land in AA (%)	..	..	-	-
Share of agriculture in water abstractions (%)	94.3	94.8	46.3	43.7
Water stress indicator	..	..	9.7	8.6

Notes: * or closest available year.
Sources: USDA Economic Research Service, Agricultural Productivity database; OECD statistical databases; FAO database and national data.

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Notes

[1] A detailed review of Viet Nam's agricultural policies since Reunification in 1976 can be found in OECD (2015[1]).

[2] Private ownership of land is not permitted. Instead, enterprises, households and individuals own land use rights, including the right to rent, buy, sell and bequeath land, and to use land as collateral with financial institutions for mortgages (Land Law of 1993).

[3] In 1995 Viet Nam became a member of the Association of Southeast Asian Nations (ASEAN) and its associated ASEAN Free Trade Area (AFTA). Viet Nam was formally admitted as a member of the Asia Pacific Economic Community (APEC) in November 1998. In December 2001, the US-Viet Nam Bilateral Trade Agreement came into effect. In 2007, Viet Nam obtained WTO membership.

[4] State-owned enterprises (SOEs) no longer play the dominant role in agricultural production that they once did. Coffee, rubber and sugar are the exemption. However, SOEs still have a considerable degree of influence over some agricultural sectors through their involvement in supplying inputs, processing outputs and trading products. For example, SOEs account for more than half of total rice exports.

[5] Resolution No. 26 is currently being reviewed with the intention of issuing a revision.

[6] Pursuant to this scheme, the Prime Minister issued Decision No. 1819/QD-TTg dated 16 November 2017 approving the plan of restructuring the agricultural sector for the period 2017-2020.

[7] Other agricultural related products held in the national reserve include rice, maize and vegetable seeds, pesticides, and animal vaccines and antiseptics.

[8] Decree No. 42/ND-CP dated 11 May 2012 on the management and use of land for rice cultivation and in effect from 1 July 2012.

[9] Wet-paddy farming land is defined as land currently under wet-paddy cultivation or having the conditions for growing two or more wet-paddy crops a year; other paddy farming land is defined as land for growing only one wet-paddy crop a year and land for growing upland rice. Approximately 95% of current paddy land meets the wet-paddy land definition (OECD, 2015[1]).

[10] Decree No. 35/2015/ND-CP on the management and use of land for rice cultivation. Along with payment increases, Decree No. 35 also introduced both a per hectare payment for reclaiming land for rice production and penalties if growers convert paddy fields to non-agricultural uses.

[11] Decree No. 62/2019/ND-CP which also revised the registration procedure that applies when paddy land is converted from rice to another crop.

[12] Resolution No. 55/2010/QH12 of the National Assembly on agricultural land use tax exemption and reduction, amended and supplemented by Resolution No. 28/2016/QH14 of the National Assembly.

[13] National Adaptation Plans were established in 2010 as part of the Cancún Adaptation Framework to enhance urgent action on adaptation and were adopted by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) (Decision 1/CP.16.). NAPs enable countries to identify, prioritise and implement the most needed medium–and long–term adaptation actions.

[14] Decree No. 107/2018/ND-CP replaced and repealed Decree No. 109/2010/ND-CP on rice export businesses.

[15] Prior to 2018 traders were required to own warehouses that can hold at least 5 000 tonnes of rice and mills that can process at least 10 tonnes per hour, and maintain rice reserves equivalent to 10% of the volume exported in the preceding six months.

[16] The 11 countries that signed the CPTPP are Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Viet Nam.

[17] The original NDC 8% reduction commitment used 2010 as the base year for estimating the 2030 BAU; the revised commitment used 2014 as the base year.

[18] Decision No. 891/QD-BNN-KHCN dated 17 March 2020.

[19] See https://www.ifad.org/en/web/latest/-/bringing-the-benefits-of-agricultural-insurance-to-smallholders-in-viet-nam.

[20] Decision No. 156/QD-BNN-KHCH dated 11 January 2021 setting out MARD's plan for implementing the Prime Minister's Decision No. 1055/QD-TTg dated 20 July 2020 approving the National climate change adaptation plan for 2021-2030 with a vision to 2050.

[21] Decree No. 41/2020/ND-CP extending tax and land rent payment deadlines was extended by Decree No. 52/2021/ND-CP.

[22] Resolution No. 42/2020/ND-Ttg dated 9 April 2020 on measures to support people coping with difficulty during the COVID-19 pandemic. Decision No. 15/2020/QD-TTg dated 24 April 2020 on the implementation of policies to support people facing difficulties due to the COVID-19 pandemic. Resolution No. 154/NQ-CP dated 19 October 2020 amending and supplementing Resolution No. 42/NQ-CP dated 9 April 2020 on measures to support people facing difficulties due to the COVID-19 pandemic. Decision No. 32/2020/QD-TTg dated 19 October 2020 amending and supplementing a number of articles of Decision No. 15/2020/QD-TTg dated 24 April 2020 of the Prime Minister on policies to support people have been facing difficulties due to the COVID-19 pandemic.

[23] Resolution No. 68/NQ-CP dated 1 July 2021 and thereafter, the amendments and supplements to Resolution No. 126/NQ-CP dated 8 October 2021.

[24] Resolution No. 116/NQ-CP dated 24 September 2021 and Prime Minister's Decision No. 28 on policies to help employees and users.

[25] Circular No. 01/2020/TT-NHNN issued on 13 March 2020, amended and supplemented by Circular No. 03/2021/TT-NHNN dated 2 April 2021 and Circular No. 14/2021/TT-NHNN dated 7 September 2021.

[26] The nine other ASEAN countries are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore and Thailand, with the other five being China, Japan, Korea, Australia and New Zealand.

Annex A. Sources and Definitions of Contextual Indicators

Table: Contextual indicators

Gross Domestic Product – GDP (USD billion in PPP): OECD National Accounts Statistics (database), Gross domestic product, USD, current prices, current PPPs. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in the OECD database.

Population (million): OECD National Accounts Statistics (database), Population and employment by main activity. Calculation based on Eurostat database for the European Union. United Nations, World Population Prospects: 2019 Population, for Emerging Economies not available in the OECD database.

Land area (thousands km^2): FAOSTAT Land Use (database), Land area (1 000 ha) recalculated to thousands km^2. Land area excludes water areas.

Agricultural area (AA) (thousand ha): FAOSTAT Land Use (database), Agricultural area (1 000 ha).

Population density (inhabitants/km^2): OECD Regional and Cities (database), Regional demography, Population density and regional area. United Nations, World Population Prospects: 2019, Population density, for economies not available in OECD database. Calculation based on the Eurostat population and area databases for the European Union.

GDP per capita (USD in PPP): OECD National Accounts Statistics (database), Gross domestic product (expenditure approach), per head, USD, current prices, current PPPs. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in OECD database.

Trade as % of GDP: Calculation based on UN COMTRADE (database) for trade data, customs data, and GDP (local currency) indicator. Average trade calculated as (exports+imports)/2. The European Union aggregate does not account for intra-EU trade.

Agriculture share in GDP (%): OECD National Accounts Statistics (database), "National Accounts at a Glance", Gross value added, Agriculture, forestry and fishing, percentage of total activity. Eurostat database for the European Union. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in OECD database.

Agriculture share in employment (%): Calculation based on OECD Labour Force Statistics (database), Employment by activities and status (ALFS), as a share of employment in agriculture, hunting, forestry and fishing in all activities (ISIC rev.3, A-B and A-X; ISIC rev.4, A and A-U). Calculation based on Eurostat, share of employed persons, aged 15 years and over, in agriculture, hunting, forestry and fishing in total NACE activities (Statistical classification of economic activities in the European Community), for the EU Member States. World Bank, World Development Indicators (WDI database), Employment in agriculture, hunting, forestry and fishing as a share of total employment; and national data for Emerging Economies not available in OECD database.

Agro-food exports in total exports (%): Calculation based on UN COMTRADE (database). Agro-food definition does not include fish and fish products. Agro-food codes in H0: 01, 02, 04 to 24 (excluding 1504,

1603, 1604 and 1605), 3301, 3501 to 3505, 4101 to 4103, 4301, 5001 to 5003, 5101 to 5103, 5201 to 5203, 5301, 5302, 290543/44, 380910, 382360.

Agro-food imports in total imports (%): Calculation based on UN COMTRADE (database). Agro-food definition does not include fish and fish products.

Crop in total agricultural production (%): National data, share of value of total crop production (including horticulture) in total agricultural production.

Livestock in total agricultural production (%): National data, share of value of total livestock production in total agricultural production.

Share of arable land in AA (%): Calculation based on FAOSTAT Land Use (database), arable land as a share of agricultural area.

Table: Productivity and environmental indicators

TFP annual growth (%): Agricultural Total Factor Productivity indices of the USDA Economic Research Service use primarily FAO data supplemented by national data. Agricultural TFP indices are estimates by country and for groups of countries aggregated by geographic region and income class. The presented growth rates are sensitive to the choice of the time period. Reported values have changed relative to previous releases following the International Agricultural Productivity database update that includes revisions of historical estimates to reflect newly available data and modifications to the estimation procedures. More information can be found in the section “Figure: Composition of agricultural output growth, 2010-19”.
USDA, Economic Research Service (2021), International Agricultural Productivity database, https://www.ers.usda.gov/data-products/international-agricultural-productivity/ (accessed December 2021).

Nitrogen balance (Kg/ha): Balance (surplus or deficit) expressed as kg nitrogen per hectare of total agricultural land calculated at the national level. OECD aggregate for nitrogen balance is calculated as the ratio between the total surplus and the total agricultural land area in the OECD area. European Union as a single area is calculated as the Gross Nitrogen Balance in the EU area over the utilised agricultural area of the EU.
OECD (2021), Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm.

Phosphorus balance (Kg/ha): Balance (surplus or deficit) expressed as kg phosphorus per hectare of total agricultural land calculated at the national level. OECD aggregate for phosphorus balance is calculated as the ratio between the total surplus and the total agricultural land area in the OECD area. European Union as a single area is calculated as the Gross Phosphorous Balance in the EU area over the utilised agricultural area of the EU.
OECD (2021), Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm.

Agriculture share of total energy use (%): Share of agricultural consumption in total final consumption (TFC).
International Energy Agency (2021), IEA World Energy Statistics and Balances (database), https://doi.org/10.1787/data-00512-en, and OECD Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm,

Agriculture share in total GHG emissions (%): Greenhouse gas emissions by source, excluding land use, land-use change and forestry (LULUCF). European Union as a single area is calculated from

UNFCCC data as Agriculture greenhouse gas emissions in the EU area over the total GHG emissions in EU area.
UNFCCC Greenhouse Gas Inventory Database (2021), https://unfccc.int, and OECD Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm

Share of irrigated area in Agricultural Area (AA) (%): Share of irrigated area in total agricultural area.
OECD (2021), Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm and FAOSTAT database for Emerging Economies not available in OECD database.

Share of agriculture in water abstractions (%): Share of agriculture in total freshwater abstractions. European Union as a single area is calculated as the total abstractions for agriculture in the EU area over the total freshwater abstractions in the EU area.
OECD (2021), Agri-environmental indicators (database), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm.

Water stress indicator: The indicator refers to the intensity of use of fresh water resources. It is expressed as gross abstraction of freshwater as percentage of total available renewable freshwater resources. European Union is treated as a single area.
OECD (2021), "Water: Freshwater abstractions", OECD Environment Statistics (database), http://dx.doi.org/10.1787/data-00602-en.

Figure: Main macro-economic indicators, 2000 to 2021

Real GDP growth (%): OECD Country Statistical Profiles, real GDP growth. OECD Economic Outlook: Statistics and Projections (database) as a benchmark for the latest year. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in OECD database. Eurostat database for the European Union for 2019 and 2020.

Inflation rate (%): OECD National Accounts Statistics (database), Prices and Purchasing Power Parities, Annual average rate of change in Harmonized Indices of Consumer Prices (HICPs). World Bank, World Development Indicators (WDI database) for Emerging Economies not available in OECD National Accounts Statistics.

Unemployment rate (%): OECD Economic Outlook: Statistics and Projections (database), Labour market statistics. Eurostat database for the European Union. International Labour Organization (ILO), Unemployment rate by sex and age (estimates and projections) for Emerging Economies not available in OECD database.

Figure: Agro-food trade

Agro-food exports (USD billion), 2000 to 2020: UN COMTRADE (database). Agro-food definition does not include fish and fish products.

Agro-food imports (USD billion), 2000 to 2020: UN COMTRADE (database). Agro-food definition does not include fish and fish products.

Composition of agro-food trade, 2020: UN COMTRADE (database). Agro-food definition in HS classification (see above) combined with the Classification by Broad Economic Categories (BEC) to generate breakdowns into type of commodities (Primary or Industrial commodities) and type of destination (Consumption or Industry).

Figure: Composition of agricultural output growth, 2010-19

TFP annual growth (%): Agricultural Total Factor Productivity indices of the USDA Economic Research Service use primarily FAO data supplemented by national data. Input growth is the weighted-average growth in quality-adjusted land, labour, capital and materials (synthetic NPK fertilisers, and animal feed), where weights are input (factor) cost shares. Special breakdown created to dissociate primary factors (land, labour and capital) from intermediate input: materials (feed and fertiliser) growth. Output growth corresponds to gross agricultural output for each country.

Agricultural TFP indices are estimates by country and for groups of countries aggregated by geographic region and income class. The European Union single area is recalculated from individual countries data and weights. The presented growth rates are sensitive to the choice of the time period.

Reported values have changed relative to previous releases following the International Agricultural Productivity database update that includes revisions of historical estimates to reflect newly available data and modifications to the estimation procedures. Key changes include the inclusion of aquaculture in output, a new FAO measure of agricultural capital stock was adopted for years since 1995 and TFP indices were rebased to 2015.

The full documentation of the revisions is available at: https://www.ers.usda.gov/data-products/international-agricultural-productivity/update-and-revision-history/.

USDA, Economic Research Service (2021), International Agricultural Productivity database, https://www.ers.usda.gov/data-products/international-agricultural-productivity/ (accessed December 2021).

Indicators used to calculate selected ratio and percentage indicators

GDP (local currency): OECD National Accounts Statistics (database), Gross domestic product, local currency, current prices. OECD Economic Outlook: Statistics and Projections (database) as a benchmark for the latest year. Calculation based on Eurostat database for the European Union. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in the OECD database.

Agriculture Gross Value Added (local currency) (AgGVA): Calculation based on Agriculture share in GDP (%) and GDP (local currency) indicators.

Deflator: OECD Economic Outlook: Statistics and Projections (database), Gross domestic product, market prices, deflator. Eurostat database for the European Union. World Bank, World Development Indicators (WDI database) for Emerging Economies not available in the OECD database.

Exchange rate: OECD National Accounts Statistics (database), Prices and Purchasing Power Parities, Nominal Exchange Rate. Eurostat database for the European Union and EU Member States. World Bank, World Development Indicators (WDI database) and national data for Emerging Economies not available in the OECD database.

Agricultural Policy Monitoring and Evaluation 2022

REFORMING AGRICULTURAL POLICIES FOR CLIMATE CHANGE MITIGATION

This annual report monitors and evaluates agricultural policies in 54 countries, including the 38 OECD countries, the five non-OECD EU Member States, and 11 emerging economies. It finds that the continued rise in agricultural support has been slower than sector growth in recent years, but has been driven to record highs mainly by temporary factors. The share of general services to the sector (including innovation and infrastructure) in total support provided to the sector has decreased to 13%. This year's report focuses on the potential for agriculture and agricultural policies to contribute to climate change mitigation. It argues that short-term agricultural policy responses to global crises must simultaneously address current challenges and support reforms to combat climate change and distortions in international markets.

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