

OECD Global Forum on Agriculture 2022: Enhancing Agriculture and Food Systems' Contribution to Climate Mitigation

6 October 2022



BACKGROUND NOTE

OECD'S GLOBAL FORUM ON AGRICULTURE

ENHANCING AGRICULTURE AND FOOD SYSTEMS' CONTRIBUTION TO CLIMATE CHANGE MITIGATION

THURSDAY 6 OCTOBER 2022

Conference Centre Room CC6

OECD Headquarters, Paris, France

Introduction: The climate change challenge

Climate change represents a complex and unique challenge for agriculture. First, the sector is particularly vulnerable due to its dependence on weather and climatic conditions. Agriculture is already experiencing negative impacts from higher temperatures and water-related disasters. In the past few months alone, European agriculture has been facing a major drought with record breaking temperatures, leading to major crop losses, while other parts of the world recorded extreme flooding. These events are expected to be more frequent and intense as climate change intensifies. Building greater resilience and adapting to climate change are significant challenges, particularly in the poorest countries where climate change impacts are expected to hit the hardest.

At the same time, 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). Agriculture, forestry and other land use (AFOLU), as a whole, represents around one-fifth (22%) of global anthropogenic GHG emissions – and if extended to the entire food system, this share increases to beyond one third. Half of AFOLU emissions stem from on-farm emissions of nitrous oxide and methane, and the other half from CO₂ emissions resulting from land use, land use change and forestry. Methane has a particularly strong influence on temperatures in the short term, thus mitigation of this gas is increasingly recognised as an important lever for stabilising climate change by the mid-century. In the absence of action, emissions from agriculture will continue to rise, and the sector's share of total emissions may increase as other sectors decarbonise.

Yet there are ample opportunities for agriculture and food systems to reduce both direct and indirect emissions. In particular, agriculture could remove carbon dioxide from the atmosphere, through carbon sequestration in biomass and soils. Moreover, this can be achieved through practices that raise productivity, such as better soil management or degraded pasture restoration. Thus, the case for strong action on climate by the sector is compelling, which also needs to occur while adapting to a changing climate to ensure provision of safe and nutritious food for all and keep supporting rural incomes and livelihoods.

Agriculture provides many climate mitigation solutions

Agriculture could play a far more important role in combating climate change. OECD research shows that with a comprehensive policy package combining emissions taxes and carbon sequestration subsidies the sector could contribute to mitigation at a rate of 8 GtCO₂eq/year in 2050, making a significant contribution to economy-wide efforts. The reduction of direct agricultural emissions represents 29% of this total, soil carbon sequestration 9%, and other land use changes 62%.

Reducing direct on-farm emissions from agricultural production will require improvements in productivity and the efficiency of input use, including through 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, via better feed and pasture quality, strengthening farm and animal management, as well as methane inhibitors provided 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, greener and more efficient fuels to power agricultural machinery. Agriculture can also help to reduce reliance on fossil fuels via the sustainable production of bioenergy.

Agricultural soils and land use change are substantial, but mostly untapped options

Agricultural soils also provide a significant carbon sink that can be enhanced to remove atmospheric CO₂ via carbon sequestration on agricultural land. This can be achieved through measures such as improved management of crop rotations, residues, vegetation, and cattle stocking densities. Halting and reversing peatland conversion can also be achieved at relatively low cost and ensure carbon in organic soils remain in the ground.

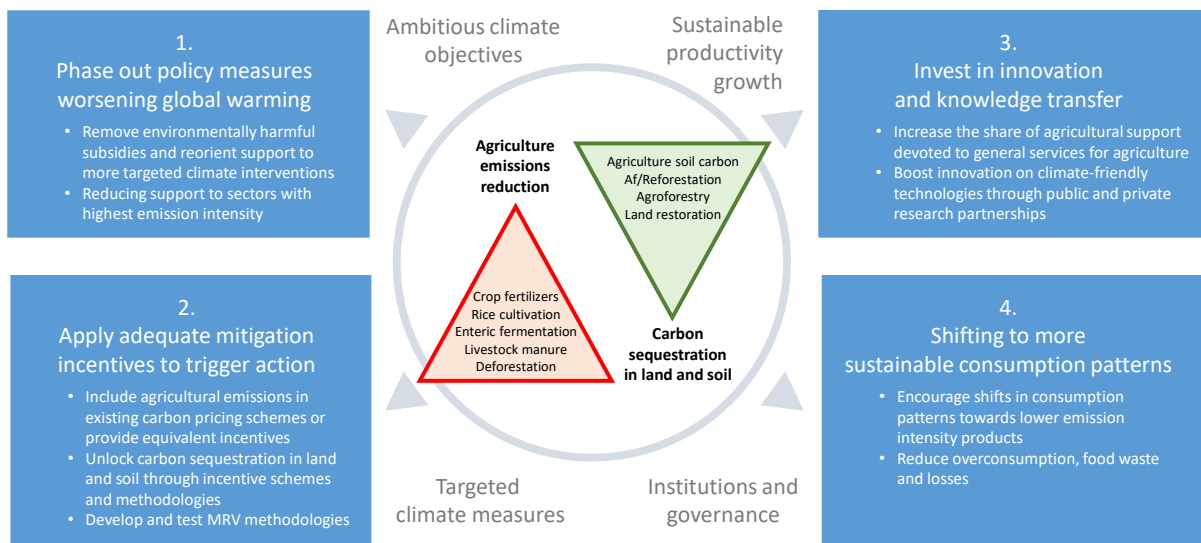
Several options are also available to significantly reduce emissions from land use change. Forest protection, coupled with improvements in agricultural productivity, can limit the expansion of agriculture into forest lands and other carbon rich ecosystems, and can also facilitate the restoring and reforestation of marginal lands. Agricultural plantations, agroforestry and afforestation on agricultural land are also promising avenues for carbon sequestration.

Deeper structural change will also have to take place to reduce the carbon footprint of agricultural production, requiring a food systems perspective that also embraces transformations along the supply chain and in food demand patterns. Shifts in consumption trends can help to reduce the emissions-intensity of food, and also reduce deforestation and biodiversity losses due to the expansion of agricultural land. Actions encouraging consumers to limit food waste and overconsumption can also help to mitigate agricultural emissions, by reducing the volume of production needed.

Current policies need to be reformed to foster climate action

Despite this potential, agriculture lags behind on climate action. By mid-2022, among 38 OECD countries and 11 major emerging economies, only 16 countries had set emissions reduction targets specific to the agricultural sector. Agriculture is also often exempt from mitigation policies such as carbon pricing or equivalent regulatory measures. And while agriculture receives considerable policy support (estimated at USD 817 billion per year in 2019-21), very little of this contributes to reducing emissions in the sector. Worse, much of this support encourages production of high-emission products and is provided by support policies with the greatest potential to raise domestic agricultural emissions.

A reform agenda in four action pillars to reduce GHG emissions and sequester carbon in agriculture



There is therefore considerable scope for agriculture to reduce its emissions by reforming agricultural support policies, and by providing direct mitigation incentives in conjunction with social safety net policies to facilitate an inclusive transition.

First, harmful effect of current policies should be counteracted. In the case of agricultural support, most distortive forms of support encouraging GHG emissions should be phased out – which includes market price support, output-based transfers and unconstrained payments to variable inputs, all also potentially harmful in other environmental domains. In particular, unconditional support to high emission intensity products should also be avoided, as well as subsidies to fossil fuel and fertilizer consumption.

Emission reductions also require the development of production systems of much lower emission intensity. For this purpose, more budgetary support should be oriented towards investments in innovation to foster emission-saving and sustainable productivity growth and ensure emergence of new mitigation technologies. Such investments would benefit from stronger partnerships between the public and private sectors to maximize synergies on research and development.

The private sector has a key role to play in climate change mitigation along the food supply chain and many initiatives have been launched by different group of producers, traders and retailers with various levels of ambition. Private sector responses to climate change are accelerating, impacting both supply chains and demand levers. Research and development are also strongly driven by private companies and investors, who are pushing the innovation frontiers in a number of directions, including for mitigation and adaptation.

Emissions pricing schemes and targeted incentives can accelerate transformations

Mechanisms that put an explicit price on emissions are the most efficient way to minimize the abatement burden for the sector, by allowing mitigation responses by producers to vary in line with variations in their marginal costs of abating emissions. These mechanisms include emissions taxes and emissions trading schemes, carbon offsets, and some abatement subsidies (e.g. delivered via auctions). 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. However, agricultural emissions tend to be excluded from most economy-wide carbon taxes and emissions trading schemes.

Where agriculture is not included in broad carbon pricing or equivalent schemes, or complementing those, a mix of approaches is needed to ensure significant emissions reductions in the sector, acting both across supply and demand sides. This includes supply side efforts to increase productivity and efficiency in input use, adopting low-emissions production techniques, increasing soil carbon sequestration and the land-based carbon sink in general. On the demand side, key measures are the provision of information and incentives to consumers to shift the emissions intensity of their food choices, and to reduce household food waste.

Some policies to reduce emissions and transform production systems may create trade-offs with food security and nutrition for consumers and livelihoods for producers. Social safety net policies targeting farmers and households most in need will thus be required to accompany climate policies. A stronger resilience toolkit will in particular be needed to facilitate agriculture's adaptation to a world of diverse risks and increasing extreme weather events and natural disasters. Coordinated action and international cooperation will be key for the success of this broad agenda.

Questions for discussion at the Global Forum on Agriculture

- How far should the agricultural sector go to reduce its direct emission sources, in particular from livestock? Can sustainable productivity growth deliver enough mitigation and avoid the need for reducing herd sizes? Which technologies are best placed to do this and which policies can best support their adoption? Should farmers be asked to pay for their emissions?
- What policies are the most promising and actionable for reduction of agricultural emissions? Is carbon farming a potential solution? Should farmers be asked to pay for their emissions, or to offset them through carbon sequestration? How can carbon farming credits or other alternatives schemes be made more reliable?
- What is the private sector doing to reduce GHG emissions in agriculture and food systems? What is driving these initiatives, and should these be seen as substitute for, or a complement to, more ambitious public efforts? To what extent are farmers and SMEs involved in the decisions to transform broader supply chains?
- Where are the low hanging fruits needed to ramp up climate mitigation in agriculture and what should be done next? What commitments should the sector take at the domestic level? Are specific GHG emission targets for agriculture necessary?
- How to foster international cooperation and action, including with the largest emitters? What commitments can OECD agriculture ministers make at the Agriculture Ministerial to show the path to greater climate ambition for the agriculture sector – one week ahead of the COP27?