OECD Food and Agricultural Reviews

Agricultural Policies in Costa Rica

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Foreword

This Review of Agricultural Policies: Costa Rica *is one of a series of reviews of national agricultural policies undertaken by the OECD's Committee for Agriculture. The Committee for Agriculture is one of the OECD technical committees mandated by the OECD Council to carry out an accession review of Costa Rica.*

The OECD Council decided to open accession discussions with Costa Rica on 9 April 2015. On 8 July 2015, the Council adopted a Roadmap for the Accession of Costa Rica to the OECD Convention [C(2015)93/FINAL] (hereafter "the Roadmap") setting out the terms, conditions and process for accession. The Roadmap provides that in order to allow the Council to take an informed decision on the accession of Costa Rica, Costa Rica will undergo in-depth reviews by 22 OECD technical committees, including the Committee for Agriculture, which will then provide the Council with a formal opinion evaluating Costa Rica's willingness and ability to implement OECD legal instruments within its competence, and evaluating Costa Rica's policies and practices as compared to OECD best policies and practices in the area of agriculture. Costa Rica submitted an Initial Memorandum setting out its initial positions on each of the substantive OECD legal instruments in force on 16 February 2016.

This Review *is being used as a background document for the accession review currently being undertaken by the OECD Committee for Agriculture as part of the process for Costa Rica's accession to the OECD. In accordance with paragraph 14 of Costa Rica's Accession Roadmap, the Committee for Agriculture agreed to declassify the report in its current version and publish it under the authority of the Secretary-General, in order to allow a wider audience to become acquainted with the issues raised in the report. Publication of this document and the analysis and recommendations contained therein does not prejudge in any way the results of the ongoing review of Costa Rica by the Committee for Agriculture as part of its process of accession to the OECD.*

The Review *examines the agricultural policy context and the main trends in Costa Rica's agriculture sector. It classifies and measures the support provided to agriculture using the same method the OECD employs to monitor agricultural policies in OECD countries and a growing number of non-member economies, such as Brazil, China, Colombia, Indonesia, Kazakhstan, Russia, South Africa, Ukraine and Viet Nam. At the request of the Costa Rican authorities, the* Review *includes a special chapter on the adaptation of agriculture to climate change. The* Review *is also a precursor in regular engagement by Costa Rican on agricultural policy issues with the OECD through the annual OECD publication* Agricultural Policy Monitoring and Evaluation.

The study was carried out by the Development Division of the OECD Trade and Agriculture Directorate (TAD) in co-operation with the Natural Resources Policy Division (TAD). Dalila Cervantes-Godoy co-ordinated the report and was one of the authors together with Laura Munro. Chapter 1 benefited from a first draft delivered by Julianne Jansen and Emily Gray. The assessment and policy recommendation Chapter greatly benefited from inputs from Julia Nielson. Background information was provided by Carlos Pomareda, Rafael Trejo and Francisco Sancho (all from Costa Rica). Clara Thompson-Lipponen provided editorial support. The database for Producer Support Estimates

and the associated analytical work was undertaken by Florence Bossard and Dalila Cervantes-Godoy. Statistical support was provided by Florence Bossard with contributions from Karine Souvanheuane. Anita Lari provided administrative and secretarial assistance. Anita Lari, Michèle Patterson and Janine Treves (from OECD/PAC) provided publication support. Ken Ash, Carmel Cahill, Julia Nielson, Frank Jesus, Pedro Caro de Sousa (from OECD/DAF), Jared Greenville, Andrzej Kwieciński, Julien Hardelin, Natalie Limbasan (from OECD/LEG), and OECD member country delegations furnished valuable comments on drafts of the report.

The Review *benefited greatly from the support provided by the Costa Rican Executive Secretariat for Agricultural Sector Planning (SEPSA) and from the Ministry of Agriculture and Livestock (MAG). Ana Isabel Gómez, Miriam Valverde, Edgar Mata, Francini Araya and Ricardo Quesada, all collaborators of SEPSA, were the main contacts and liaison person on all aspects of the study.*

The study also benefited from substantive inputs from the team of experts from the Costa Rican government: Roberto Azofeifa (MAG), Lorena Jimenez (MAG), Roberto Flores (SEPSA), María Mercedes Flores (SEPSA), Henry Benavides (COMEX), Federico Arias (COMEX), Vivian Campos (COMEX), Manuel Tovar (COMEX), Andrea Meza Murillo (MINAE), Pascal Girot (MINAE) and Marianela Borbon (former MAG employee). Experts from other government agencies such as the Central Bank of Costa Rica, Ministry of Finance, National Institute of Statistics and Census (INEC), Ministry of Economy, Industry and Commerce (MEIC), Ministry for National Planning and Economic Policy (MIDEPLAN), National Insurance Institute (INS), Development Banking System (SBD), National Meteorological Institute (IMN), National Commission for Risk Prevention and Emergency Care, etc. provided data and essential information. The study also benefited from the input of staff from MAG and its related entities and participants at preparatory meetings and consultations in San José, including researchers from academia and experts from international organisations such as Inter-American Institute for Cooperation on Agriculture (IICA), Food and Agriculture Organization of the United Nations (FAO), United Nations Development Programme (UNDP), US Embassy, United States Agency for International Development (USAID), and Central American Bank of Economic Integration (BCIE).

Other substantial information was provided by MAG's associated institutions such as The National Institute of Innovation and Transfer of Agricultural Technology (INTA), the National Animal Health Service (SENASA), the State Phytosanitary Service (SFE), the National Seed Office (ONS), the National Council Club 4-S (CONAC), the Rural Development Institute (INDER), the National Production Council (CNP), the National Irrigation and Drainage Service (SENARA), the Comprehensive Agricultural Marketing Programme (PIMA) and the Costa Rican Fishing Institute (INCOPESCA). Other important information was also provided by different farmer organisations such as: the National Rice Corporation (CONARROZ), the Costa Rica Coffee Institute (ICAFE), the National Banana Corporation (CORBANA), the Agricultural Industrial League of Sugarcane (LAICA), the Livestock Development Corporation (CORFOGA): CORFOGA, the National Chamber of Pineapple Producers and Exporters (CANAPEP), the National Chamber of Palm Producers (CANAPALMA), the National Chamber of Milk Producers (PROLECHE), the Costa Rican Chamber of Pork Producers (CAPORC), the National Chamber of Poultry Producers (CANAVI), the National Chamber of Coffee, the National Chamber of Agriculture and Agribusiness (CNAA), and the Union of Small-scale Farmers (UPANACIONAL).

Preparation of the Review *has been undertaken in close co-operation with the Ministry of Agriculture and Livestock (MAG) of Costa Rica, as well as the Ministry of Trade (COMEX) and the Ministry of Environment and Energy (MINAE). The study was reviewed at an in-country Roundtable in San José in July 2016 with the participation of MAG and its associated agencies, representatives from the Ministry of Trade and from the Ministry of Environment, and stakeholders. Subsequently, the Costa Rican delegation led by the Minister of Agriculture Mr. Luis Felipe Arauz Cavallini,*

participated in the peer review of Costa Rican agricultural policies by the OECD's Committee for Agriculture at its 167th session in November 2016. We are grateful to Mitchel Wensley and Sudarma Samarajeewa (Canada), Carla Boonstra and Jen Sevenster (Netherlands) and Mark Cropper (European Union) for serving as lead discussants during this peer review. While the OECD very much appreciates the involvement of Costa Rican officials from the initial discussions of the study outline through to the peer review and final revisions, the final report remains the sole responsibility of the OECD.

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Abbreviations

Acronym	English	Spanish
ACI	Central America Import Tariff	*Arancel de Importación América Central*
ADII	Indigenous Holistic Development Authority	*Asociaciones de Desarrollo Integrales Indígenas*
AGEI	Agricultural Growth Enabling Index	*Índice de ambiente apto para el crecimiento agropecuario*
AIC	Computerized Central Tariff	*Arancel Informatizado Central*
ANAO	National Association of Organic Agriculture	*Asociación Nacional de Agricultura Orgánica*
APS	Agricultural Public Sector	*Sector Publico Agropecuario*
AyA	Costa Rican Institute of Aqueducts and Sewers	*Acueductos y Alcantarillado*
BCCR	Central Bank of Costa Rica	*Banco Central de Costa Rica*
BNCR	National Bank of Costa Rica	*Banco Nacional de Costa Rica*
CACIA	Costa Rican Chamber for the Food Industry	*Cámara de la Industria Alimentaria*
CACM	Central American Common Market	*Mercado Común Centroamericano*
CAFTA-DR	Central America Free Trade Agreement-Dominican Republic	*Tratado de Libre Comercio entre Estados Unidos, Centroamérica y República Dominicana*
CAN	National Agricultural Council	*Consejo Agropecuario Nacional*
CANAPALMA	National Chamber of Palm Producers	*Cámara Nacional de Productores de Palma*
CANAPEP	National Chamber of Pineapple Producers and Exporters	*Cámara Nacional de Productores y Exportadores de Piña*
CANAVI	National Chamber of Poultry Producers	*Cámara Nacional de Avicultores de Costa Rica*
CAPORC	Costa Rican Chamber of Pork Producers	*Cámara Costarricense de Porcicultores*
CARICOM	Caribbean Community	*Comunidad del Caribe*
CAT	Tax Credit Certificates	*Certificados de Abono Tributario*
CATIE	Tropical Agricultural Research and Higher Education Center	*Centro Agronómico Tropical de Investigación y Enseñanza*
CCRFTA	Canada-Costa Rica Free Trade Agreement	*Tratado de Libre Comercio entre Costa Rica and Canada*
CHN	National Horticultural Corporation	*Corporación Nacional de Horticultura*
CIF	Cost, Insurance and Freight	*Costo, Seguro y Flete*
CNAA	National Chamber of Agriculture and Agribusiness	*Camara Nacional de Agricultura y Agroindustria*
CNE	National Commission of Risk Prevention and Emergency Response	*Comisión Nacional de Emergencias*
CNHyM	National Hydrological and Meteorological Committee	*Comité Nacional de Hidrología y Meteorología*
CNP	National Production Council	*Consejo Nacional de Producción*
COMEX	Ministry of Foreign Affaires	*Ministerio de Comercio Exterior*
CONAC	National Council Club 4 S	*Consejo Nacional de Clubes 4S*
CONARROZ	National Rice Corporation	*Corporación Arrocera Nacional*
CONITTA	National Commission for Agricultural Research and Technology Transfer	*Comisión Nacional de Investigación y Transferencia de Tecnología Agropecuaria*
Consumer NPC	Consumer Nominal Protection Coefficient	*Coeficiente de Protección Nominal al Productor*
Consumer SCT	Consumer Single Commodity Transfers	*Transferencia Individual al Producto del Productor*
Consumer-NAC	Consumer Nominal Assistance Coefficient	*Coeficiente de Asistencia Nominal al Consumidor*
CORBANA	National Banana Corporation	*Corporación Bananera Nacional*
CORFOGA	Livestock Development Corporation	*Corporación Ganadera*
COTECSA	Agricultural Sectoral Technical Committee	*Comité Técnico Sector Agropecuario*
CRC	Costa Rican Colones	*Colones de Costa Rica*
CSE	Consumer Support Estimate	*Estimador de Apoyo al Consumidor*
CSRA	Regional Agricultural Sector Committees	*Comité Sectorial Regional Agropecuario*

Acronym	English	Spanish
CTDR	Regional Boards of Territorial Development	*Consejos Territoriales de Desarrollo Rural*
DCC	Directorate of Climate Change	*Dirección de Cambio Climático*
DRAT	Arenal-Tempisque Irrigation District	*Distrito de Riego Arenal-Tempisque*
ECADERT	Central American Strategy for Territorial Development	*Estrategia Centroamericana de Desarrollo Rural Territorial 2010-2030*
ECLAC	Economic Commission for Latin America and the Caribbean Comisión	*Económica para América Latina*
EHC	Export Health Certificates	*Certificados de Salud para la Exportación*
ENCC	National Climate Change Strategy	*Estrategia Nacional de Cambio Climático*
ENSO	El Niño Southern Oscillation	*El Niño oscilación del sur*
ERAS	Regional Environmental and Health Strategy	*Estrategia Regional Agroambiental y de Salud*
ERCC	Regional Climate Change Strategy	*Estrategia Regional de Cambio Climático*
EU-CAAA	European Union-Central America Association Agreement	*Acuerdo de Asociación entre Europa y Centroamérica*
FANAL	Costa Rica's National Liquor Factory	*Fábrica Nacional de Licores*
FAO	United Nations Food and Agriculture Organization	*Organización de las Naciones Unidas para la Alimentación y la Agricultura.*
FCD	Credit Fund for Development	*Fondo de Crédito para el Desarrollo*
FDI	Foreign Direct Investment	*Inversión extranjera directa*
FECALAC	Central American Dairy Sector Federation	*Federación Centroamericana del Sector Lácteo*
FEPALE	Panamerican Dairy Federation	*Federación Panamericana de Lechería*
FINADE	The National Trust for Development	*Fideicomiso Nacional para el Desarrollo*
FITTACORI	Foundation for the Development and Promotion of Research and Transfer of Agro-Technology	*Fundación para el Fomento y Promoción de la Investigación y Transferencia de Tecnología Agropecuaria de Costa Rica*
FOFIDE	National Development Fund	*Fondo de Financiamiento para el Desarrollo*
FONAFIFO	National Forestry Financing Fund	*Fondo Nacional de Financiamiento Forestal*
FTA	Free Trade Agreement	*Tratado de Libre Comercio*
FTZ	Free Trade Zone	*Zona Francas*
GAO	Gross Agricultural Product	*Producción Agropecuaria Total*
GATS	Fifth Protocol to the General Agreement on Trade in Services	*Quinto Protocolo del Acuerdo General sobre el Comercio de Servicios*
GATT	General Agreement on Tariffs and Trade	*Acuerdo General sobre Aranceles Aduaneros y Comercio*
GATT-UR	General Agreement on Tariffs and Trade-Uruguay Round	*Acuerdo General sobre Aranceles Aduaneros y Comercio-Ronda de Uruguay*
GDP	Gross Domestic Product	*Producto Interno Bruto*
GHG	Greenhouse Gas Emissions	*Emisiones de Gas de effecto invernadero*
GSP	Generalised System of Preferences	*Sistema Generalizado de Preferencias*
GSSE	General Services Support Estimate	*Estimador de Apoyos a Servicios Generales*
HDI	Human Development Index	*Indice de Desarrollo Humano*
HS	Harmonized System	*Sistema Armonizado*
IADB	Inter-American Development Bank	*Banco Interamericano de Desarrollo*
ICAFE	Costa Rica Coffee Institute	*Instituto del Café de Costa Rica*
ICE	Costa Rican Electricity Institute	*Instituto Costarricense de Electricidad*
ICO	International Coffee Organization	*Organización Internacional del Café*
ICT	Costa Rican Tourism Institute	*Instituto Costarricense de Turismo*
IDA	Institute of Agrarian Development	*Instituto de Desarrollo Agrario*
IICA	Inter-American Institute for Cooperation on Agriculture	*Instituto Interamericano de Cooperación para la Agricultura*
ILO	International Labour Organisation	*Organización Internacional del Trabajo.*
IMAS	Joint Social Welfare Institute	*Instituto Mixto de Ayuda Social*
IMF	International Monetary Fund	*Fondo Monetario Internacional*
IMN	National Meteorological Institute	*Instituto Meteorológico Nacional*
INCOPESCA	Costa Rican Institute of Fishing and Aquaculture	*Instituto Costarricense de Pesca y Acuicultura*
INDC	Intended Nationally Determined Contributions	*Contribuciones Destinadas de Determinación Nacional*
INDER	The Rural Development Institute	*Instituto de Desarrollo Rural*
INEC	National Institute of Statistics and Census	*Instituto Nacional de Estadística y Censos*

Acronym	English	Spanish
INFOAGRO	Market Information System	*Sistema de Información Agropecuaria de Costa Rica*
INS	National Insurance Institute	*Instituto Nacional de Seguros*
INTA	National Institute for Innovation and Transfer of Agricultural Technology	*Instituto Nacional de Tecnología Agropecuaria*
IPCC	Intergovernmental Panel on Climate Change	*Grupo Intergubernamental de Expertos sobre el Cambio Climático*
ITA	Information Technology Agreement	*Acuerdo sobre Tecnología de la Información*
ITCO	Institute for Lands and Colonization	*Instituto de Tierras y Colonización*
LAICA	Agricultural Industrial League of Sugarcane	*Liga Agrícola Industrial de la Caña de Azúcar*
MAG	Ministry of Agriculture and Livestock	*Ministerio de Agricultura y Ganadería*
MEIC	Ministry of Economy, Industry and Commerce	*Ministerio de Economia, Industria y Comercio de Costa Rica*
MESA	National Farmers Organization	*Mesa Nacional Campesina*
MFN	Most Favoured Nation	*Nación Más Favorecida*
MICCA	Mitigation of the Effects of Climate Change on Agriculture	*Mitigación de los Efectos del Cambio Climático en la Agricultura*
MIDEPLAN	Ministry for National Planning and Economic Policy	*Ministerio de Planificación Nacional y Política Económica*
MINAE	Ministry of Environment and Energy	*Ministerio de Ambiente y Energía*
MIRENEN	Ministry of Energy and Natural Resources	*Ministerio de Recursos Naturales, Energía y Minas*
MPS	Market Price Support	*Apoyo al Precio de Mercado*
NAMA	Nationally Appropriate Mitigation Actions	*Acciones Nacionales de Mitigación Apropiadas*
NCCAP	National Climate Change Action Plan	*Plan de Acción Nacional al Cambio Climático*
NDP	National Development Plan	*Plan Nacional de Desarrollo*
NHP	National Water Policy	*Política Hídrica Nacional*
OECD	Organisation for Economic Co-operation and Development	*Organización para la Cooperación y Desarrollo Económico*
ONS	National Seed Office	*Oficina Nacional de Semillas*
PACA	Central American Agricultural Policy	*Política Agrícola Centroamericana 2008-2017*
PAI	Institutional Supply Programme	*Programa de Abastecimiento Institucional*
PARD	Irrigation of Small Areas programme	*Programa de Riego en Áreas Pequeñas.*
PEN	State of Nation Programme	*Programa del Estado de la Nación*
PFPAS	Program Promoting Sustainable Agricultural Production	*Programa de Fomento de la Producción Agropecuaria Sostenible*
PIMA	Comprehensive Agricultural Marketing Programme	*Programa Integral de Mercadeo Agropecuario*
PNAO	National Programme of Organic Agriculture	*Programa Nacional de Agricultura Orgánica*
PPP	Purchasing Power Parity	*Paridad del Poder Adquisitivo*
PROCOMER	Export Promotion Agency	*Promotora de Comercio Exterior*
Producer NAC	Producer Nominal Assistance Coefficient	*Coeficiente de Asistencia Nominal al Productor*
Producer NPC	Producer Nominal Protection Coefficient	*Coeficiente de Protección Nominal al Productor*
Producer SCT	Producer Single Commodity Transfers	*Transferencia Individual al Producto del Productor*
PROLECHE	National Chamber of Milk Producers	*Cámara Nacional de Productores de Leche*
PSE	Producer Support Estimate	*Estimador de Apoyo al Productor*
R&D	Research and Development	*Investigación y Desarrollo*
RBAO	Recognition of Environmental Benefits for Organic Production	*Reconocimiento de Beneficios Ambientales para la Producción Orgánica*
RZF	Free Trade Zone Regime (RZF)	*Régimen de Zonas Francas*
SAP	Structural Adjustment Programmes	*Programas de Ajuste Estructural*
SBD	Development Bank System	*Sistema Bancario Nacional*
SENARA	National Service of Underground Water, Irrigation, and Drainage	*Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento*
SENASA	National Animal Health Service	*Servicio Nacional de Salud Animal*
SEPSA	Executive Secretariat for Agricultural Sector Planning	*Secretaria de Planificación del Sector Agropecuario*
SFE	National Phytosanitary Service	*Servicio Fitosanitario del Estado*
SICA	Central American Integration System	*Sistema de la Integración Centroamericana*
SIECA	Secretariat of Central American Economic Integration	*Secretaría de Integración Económica Centroamericana*
SINAC	National System of Conservation Areas	*Sistema Nacional de Áreas Protegidas*

Acronym	English	Spanish
SNITTA	National System of Agricultural Research and Technology Transfer	*Sistema Nacional de Investigación y Transferencia de Tecnología Agrícola*
SPS	Sanitary and Phytosanitary measures	*Medidas Sanitarias y Fitosanitarias*
TCM	Moin Container Terminal port	*Terminal de Contenedores de Moín port*
TFP	Total Factor Productivity	*Factor Total de Productividad*
TSE	Total Support Estimate	*Estimador al Apoyo Total*
UN	United Nations	*Naciones Unidas*
UNA	National University of Costa Rica	*Universidad Nacional de Costa Rica*
UNDP	United Nations Development Programme	*Programa de Naciones Unidas para el Desarrollo*
UNED	Distance State University	*Universidad Estatal a Distancia*
UNFCCC	United Nations Framework Convention on Climate Change	*Convención de Naciones Unidas sobre el Cambio Climático*
UPANACIONAL	Union of Small Scale Farmers	*Unión de Pequeños Productores Agropecuarios Costarricenses*
USAID	United States Agency for International Development	*Agencia de los Estados Unidos para el Desarrollo Internacional*
VAT	Value Added Tax	*Impuesto al Valor Agregado*
VUCE	Window for Foreign Trade	*Ventanilla Única de Comercio Exterior*
WTO	World Trade Organisation	*Organización Mundial de Comercio*

Executive summary

Costa Rican agriculture has a strong base upon which to build. The success of the sector has been underpinned by the country's political stability, robust economic growth and high levels of basic health and education service provision. The agricultural sector has achieved significant export success, concentrated both in new crops, such as pineapples and palm oil, and traditional crops, such as coffee and bananas. Costa Rica is a highly competitive and leading exporter of pineapples, with over 50% share of the world market (COMEX, 2016). Moreover, the agricultural sector benefits from a strong government commitment to poverty reduction, agriculture and rural development, and from the provision of a range of general services for agriculture, including extension services, research and development (R&D), and plant and animal health services. Lastly, Costa Rica's enduring record of environmental protection has enabled it to reduce its vulnerability to natural hazards. While the emphasis on environmental protection has involved some short-term trade-offs – notably in the form of increased pressure on land availability – it has also provided longer-term *benefits* for the sector, including potential new opportunities for higher-value "green" marketing.

Support for agriculture, as measured by the OECD's Producer Support Estimates (PSE), remains relatively low at 10.1% in 2013-15, compared to an OECD average of 17.6% over the same period. While Costa Rica's overall support to agriculture is low, the protection that it does maintain – Market Price Support (MPS) for key crops, notably rice – is of the most production and trade distorting kind. In 2013-15 MPS accounted for 97% of the PSE. This type of support raises the price of key staples for poor households, largely supports major landowners and millers, and reduces farmers' flexibility to choose more productive and adaptive crops in the face of climate change. Support in terms of government budget outlays presents a more positive picture. About 80% of government support provided through budgetary allocation to the agricultural sector in 2013-15 was in the form of general services to the sector as a whole, a figure higher than the OECD average of 20% for the same period. But overall, the total value of transfers arising from all forms of support to agriculture represents an important cost to the economy, equivalent to 1.1% of GDP, underscoring the need to reform costly MPS policies and to ensure the efficacy of investments in services to agriculture.

The government faces challenges in achieving its stated objectives of increasing productivity, continuing export success, reducing rural poverty, and ultimately increasing the contribution of agriculture to the economy overall. For instance, the traditional agricultural sector – dominated by smallholders – continues to have low productivity, and few inroads have been made in rural poverty reduction, due to factors such as low education levels, lack of agricultural infrastructure and limited integration of smallholders into supply chains. More broadly, productivity growth has stalled across a range of agricultural products, including in the competitive export sector and, with land availability constrained, increased production must come from higher yields through more efficient use of inputs, improved

labour productivity and innovation. Raising productivity and continued export success in competitive global markets will require efforts to address bottlenecks in the enabling environment – notably infrastructure, innovation and access to financial services – as well as maximising Costa Rica's comparative advantage in higher-value niche products. Increased productivity will also depend on efficient provision of services to support overall development of the sector, especially those services that facilitate innovation and improved access to input and output markets. Central to achieving this will be better implementation of programmes, improved co-ordination among institutions, and reduced bureaucratic processes.

The Costa Rican agricultural sector must also position itself to face two new challenges: the scheduled liberalisation of the sector under a number of trade agreements and the uncertain impact of climate change. Managing the transition to liberalisation presents an opportunity to reform costly policies, particularly for protected import competing products. An alternative policy package to enable a smooth transition to more open markets would include new investments in innovation, productivity and diversification to support competitive farm businesses and transition assistance for those producers who will turn to more remunerative activities outside of agriculture.

Costa Rica's vulnerability to extreme weather events is expected to worsen with climate change, threatening the agricultural sector's long term prospects. Costa Rica is among global leaders in responding to climate change, with a long history of environmental protection, sustainable development and action on climate change mitigation. Noteworthy efforts to promote adaptation among farmers are also ongoing – yet opportunities for further development remain. In particular, alignment between adaptation and other agricultural objectives could be strengthened to prepare for climate change. Farmer awareness could also be enhanced through strengthened co-ordination on R&D and technical assistance. Lastly, current regulations and financial incentive programmes for farmers could encourage adaptation by focusing on future – as opposed to current – vulnerabilities.

Key policy recommendations

Increasing productivity

- Increase the effectiveness of government services to the agricultural sector.
- Strengthen institutional co-ordination and budgetary mechanisms.
- Strengthen the enabling environment for productivity growth and poverty reduction.

Enhancing value and inclusion

- Enable diversification into niche or differentiated products.
- Foster greater competition within the market structure.

Reducing market price support and promoting adjustment

- Send credible policy signals on reform – in particular, announce a timetable for the reduction of market support.
- Announce a timetable for phased liberalisation to facilitate orderly adjustment.
- Identify alternative paths for those that may struggle to compete, and provide social safety net measures for displaced farmers.
- Facilitate movement out of agriculture by improving rural education and skills.

Adapting to climate change

- Align objectives, institutions and funding with a longer-term perspective to prepare for and increase resilience to climate change.
- Strengthen farmers' awareness of vulnerability to climate change and adaptive solutions.
- Improve the enforcement of soil, water and infrastructure regulations to encourage adaptive behaviour.
- Encourage adaptation through existing financial tools.

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Assessment and policy recommendations

Assessment

This *Review*, undertaken in close co-operation with the Costa Rican Executive Secretariat for Agricultural Sector Planning (SEPSA) and other institutions of the Agricultural Public Sector (APS), assesses the performance of the agricultural sector in Costa Rica over the last two decades, evaluates the country's agricultural policy reforms, and provides recommendations to address future challenges faced by the sector. The evaluation is based on the OECD Committee for Agriculture's approach that agricultural policy should be evidence-based and carefully designed and implemented to support productivity, competitiveness and sustainability, while avoiding unnecessary distortions to production decisions and to trade. The *Review* also includes a special chapter highlighting recent advancements and key challenges related to the adaptive capacity of agriculture to climate change.

Agricultural policy context

Costa Rica's political, economic and environmental conditions have benefitted its agricultural sector

Costa Rica is a small country (51 000km^2), with a population of 4.8 million in 2014. The country's long **democratic tradition** and political stability have underpinned its important **economic progress** – including the development of its agricultural sector. Political stability has helped to secure land property rights and to attract Foreign Direct Investment (FDI). Propelled by an outward-oriented growth strategy in the 1980s, the economy has grown by around 4.2% per annum over the last 15 years, exceeding the average growth of a number of other economies in the region (INEC, 2016). Inflation has been on a declining trend, from 19% in 1990 to 0.8% in 2015 – recent low inflation was due to falling commodity prices, spare capacity in the economy and exchange rate appreciation (OECD, 2016a). However, Costa Rica is now facing an important **fiscal deficit** that in 2015 reached 6% of GDP. Unemployment was low, averaging around 5% until 2008, but sharply increased following the global economic crisis, and has subsequently remained consistently around 8% (Figure 1). Notwithstanding the impact of the crisis, 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 15 377 – in purchasing power parity (PPP) terms – in 2015. However, inequality, as measured by the Gini coefficient (where 1 is completely unequal), has increased during the last 20 years, reaching 0.49 in 2012[1] (WDI, 2016; INEC. 2015).

Costa Rica's rich **natural resource endowment** – and its preservation through significant achievements in **environmental protection** – has also supported development of the agricultural sector. Despite its small land area, Costa Rica's rich biodiversity, fertile land and favourable climatic conditions underpin its comparative advantage in a diverse range of agricultural products. The country also has an abundant water supply, although water scarcity is a growing concern in certain regions. Environmental regulations have led to the reforestation of large parts of the country, and 25% of Costa Rican territory is now under some category of environmental protection (INBio, 2016). A strong prioritisation of sustainability and environmental awareness in agri-environmental policies has also helped to reduce the

agricultural sector's vulnerability to natural hazards. However, resilience is a continuing challenge: Costa Rica already has the seventh highest risk of natural disasters worldwide (ADI, 2014), and the severity and frequency of natural hazards is projected to increase with climate change.

Agriculture features a highly competitive export sector, alongside a low-productivity traditional domestic sector

Agriculture's **share in GDP** has declined over the last two decades – from 13.7% in 1995 to 5.6% in 2013 (Table 1) – due to structural transformation in the Costa Rican economy. Over the same period, the share of agriculture in **employment** also declined – from 21.4% to 12.7%. Notwithstanding this decline, the agricultural sector remains the second largest source of employment in Costa Rica (INEC – ECE, 2016), underscoring its central role in rural areas.

The agricultural sector has developed a successful and **dynamic export sector** in recent decades. Building on Costa Rica's outward-oriented growth strategy in the 1980s and integration in international markets, agricultural exports grew by an average of 5.6% per year from 1994 to 2015. While exports declined due to falling demand during the global economic crisis in 2009, they recovered quickly. The share of agro-food exports in total exports has declined since the 1990s, reflecting the success of manufacturing and service activities, but has stabilised at around 38% from 2010 onwards (Table 1).

Although Costa Rican exports are dominated by **commodities**, processed goods have gained in importance. Costa Rica has been particularly successful in exporting new crops such as pineapples, where it is a leading exporter with a world market share of 55% in 2015, as well as continuing to successfully export more traditional crops such as bananas, coffee and sugar. Processed goods – in particular, pineapple juice (for which its world market share was 19.5% in 2015), syrups and concentrates – are also common. Food industry exports have grown dramatically in the last decade, achieving a growth rate of 4% in 2014–15 (PROCOMER, 2016). Main food exports are syrups and concentrates (20%), juice and concentrates (13%), palm oil (7.8%), sauces and preparations (6.9%), pastry (5.4%) and sugar (6%) (PROCOMER, 2016). The number of products exported increased from 289 in 2006 to 342 in 2015 for the whole food industry (PROCOMER, 2016).

Costa Rica's main agro-food **export destination** is the United States (accounting for 35% of agro-food exports in 2015), although exports to other countries in Latin America are increasing (26% of agro-food exports over the same year). Trade agreements seem to have played a large role in the diversification of export destinations; all member states of the Dominican Republic-Central America Free Trade Agreement (CAFTA-DR) – the United States, Nicaragua, Guatemala, Honduras, El Salvador and the Dominican Republic – are now within the top 15 export markets for Costa Rica, accounting for more than 50% of all trade (UN Comtrade database, 2016).

Agro-food **imports** have increased significantly over the last two decades, closing the gap between exports and imports. Imports rose from 0.3 USD billion in 1995 to 1.9 USD billion in 2015 (UN Comtrade database, 2016; Figure 2), although the importance of agro-food in total imports has not changed, and remains at around 11%. Basic staples for domestic consumption dominate imports: maize, soya, wheat and rice were among the most important agro-food imports in 2015. Other key imports are chicken, pork and dairy, as well as bakery products. While still concentrated in the United States (40% in 2015), agro-food imports have shifted to some extent to Latin America (where imports increased from 30% of total imports in 1995 to 35% in 2015) and China (3%) for the same year.

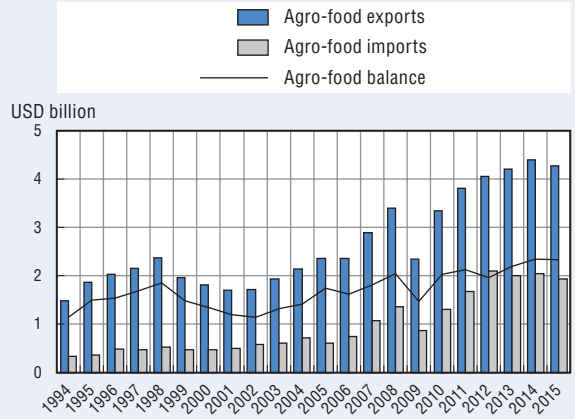
Box 1. **Costa Rica: Agriculture in context**

Figure 1. **Costa Rica: Selected macroeconomic indicators, 1990-2015**

Source: International Monetary Fund (IMF) (2016); *World Economic Outlook Database* (WEO) (2016).

StatLink http://dx.doi.org/10.1787/888933451395

Figure 2. **Costa Rica's agro-food trade, 1994-2015**



Note: Agro-food trade includes fish and fish products.

Source: UN, *UN Comtrade Database* (2016).

StatLink http://dx.doi.org/10.1787/888933451404

Table 1. **Contextual indicators, 1995, 2015[1]**

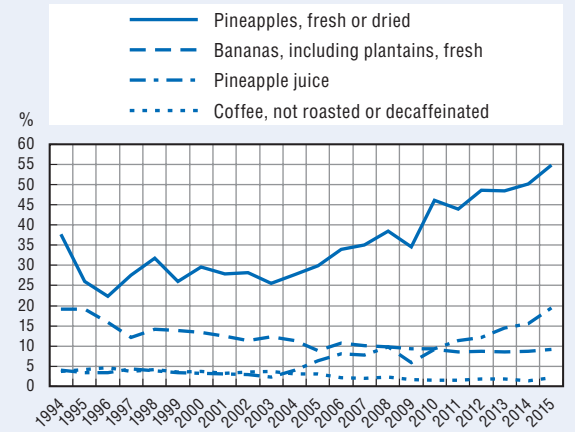
	Costa Rica	
	1995	2015 (1)
Economic context		
GDP (billion USD in PPPs)	22	74
Population (million)	3.5	4.8
Land area (thousand km2)	51	51
Agricultural area (AA) (thousand ha)	2 048	1 817
Population density (inhabitants/km2)	69	94
GDP per capita (USD in PPPs)	6 136	15 377
Trade[(2)] as % of GDP	50	49
Agriculture in the economy		
Agriculture in GDP (%)	13.7	5.6
Agriculture share in employment (%)	21.4	12.7
Agro-food exports[(3)] (% of total exports)	69.0	44.7
Agro-food imports[(3)] (% of total imports)	11.2	12.5
Characteristics of the agricultural sector		
Crop in total agricultural production (%)	77	67
Livestock in total agricultural production (%)	23	33
Share of arable land in AA (%)	11	13

1. Or latest available year.
2. Ratio of the sum of exports and imports to GDP.
3. Including fish and fish products.

Sources: World Bank (2016), *World Development Indicators*; UN, *UN Comtrade Database* (2016)

StatLink http://dx.doi.org/10.1787/888933451410

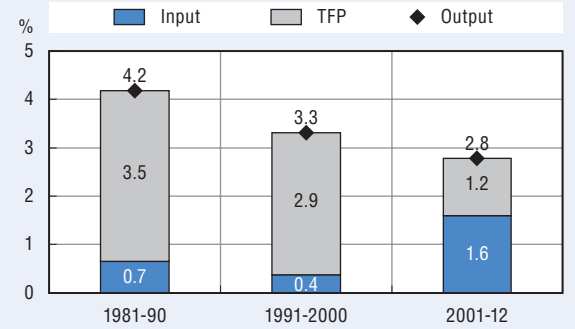
Figure 3. **Costa Rica's share in world exports of selected commodities, 1994-2015**



Source: UN, *UN Comtrade Database* (2016).

StatLink http://dx.doi.org/10.1787/888933451423

Figure 4. **Output growth attributable to productivity growth and growth in inputs, by period**



Source: Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.

StatLink http://dx.doi.org/10.1787/888933451436

The agricultural sector in Costa Rica has a **dualistic structure**, with a strong agricultural export sector accompanied by a low-productivity, traditional sector producing mostly for the domestic market. There have been limited spillovers from the successful export sector dominated by medium-large farms to the weaker traditional sector, which is characterised by less competitive, small-scale farms experiencing slow growth. Fragmentation is also a concern – while medium and large farms are consolidating, the number of farms of less than five ha has increased in recent decades and now they account for a majority of farms (52.1%). More than one third (36.3%) of small-scale farms (below 5 ha) produce coffee as their principal activity (INEC, 2014). Common products in the traditional sector include fruits and vegetables and staple grains. Many produce staple grains for their own consumption (including 72% of rice farmers, 71% of maize farmers, and 65% of bean farmers [INEC, 2014]). For many of these crops, there is a limited integration of smallholders in supply chains (SEPSA, 2016).

Moreover, while Costa Rica's **poverty** rate is lower than that of most Latin American countries, the *incidence* of poverty has not improved over the last 20 years. In rural areas, 30.3% of households lived under the national poverty line in 2014 (INEC, 2016). The highest poverty rates are found in the region bordering Nicaragua, the main source of migrants and a significant share of informal labour in the agricultural sector. Informal labour is growing in the agricultural sector, increasing from around 50% to 60% of total agricultural labour in 2014 (INEC-ECE, 2016).

Productivity growth has slowed

Productivity growth in the agricultural sector has slowed (Figure 4), and is low relative to other Latin American countries. During the 1980s and 1990s, structural change in the sector induced rapid growth in Total Factor Productivity (TFP). However, TFP growth has decreased over the last decade. Since the 1990s, average yields have remained stable for many of Costa Rica's main crops: coffee, rice, sugar and palm. Notable exceptions are the rise in pineapple yields and, to a certain extent, bananas. Contributing factors to the deceleration in yield and productivity growth include the expansion of certain crops into less productive land, growing fragmentation of smaller farms, exposure to natural hazards, low labour productivity (due to low education levels and lack of skills), and limited access to new and more efficient agrochemicals. Productivity growth is also constrained by deficiencies in the broader enabling environment, such as low-quality rural infrastructure and limited access to credit for productivity-enhancing investments.

Agricultural policy evaluation

Background

Over recent decades, Costa Rica's agricultural policy has progressed through three distinct phases:

- From the 1960s to the 1980s – as elsewhere in Latin America – Costa Rica's agricultural sector followed an **import substitution** path, supported by government intervention.
- From the mid-1980s, Costa Rica undertook major agricultural reforms, moving from import substitution to **trade liberalisation**. The main policy objectives for the agricultural and food sectors were the strengthening of agricultural exports through both diversification of products and development of new markets. In line with this outward-oriented growth strategy, the level of state intervention in markets significantly declined.

- Since the food price crisis (2007-08), **food security** has become an important objective. Specific strategies have been developed, particularly since 2014, to reduce poverty by **improving conditions in rural areas**, and to increase the contribution of agriculture to the economy[2] by increasing **sustainable productivity**, with an emphasis on small-scale farms, and continued success in export-oriented agriculture. Several specific goals for increasing productivity through yield-targets have been set for some staple crops, such as rice, beans, potatoes and milk.

Today, Costa Rica's agricultural policy priorities are articulated in three main strategic plans: (i) a long-term strategy for the agricultural sector, the "State Policy for the Costa Rican Agri-food Sector and Rural Development 2010-2021" (*Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010-2021*) (SEPSA-MAG, 2011); (ii) a short-term strategy for the agricultural sector, the "Policies for the Agricultural Sector and Rural Territorial Development" (*Políticas para el Sector Agropecuario y el Desarrollo de los Territorios Rurales)* for 2015-18 (SEPSA-MAG, 2014); and, at national level, (iii) the National Development Plan 2015-2018 (NDP) (*Plan Nacional de Desarrollo*) articulated through the sectoral plan the Agricultural and Rural Development Plan 2015-2018: *"Plan Sectorial de Desarrollo Agropecuario y Rural 2015-2018"* (MIDEPLAN, 2014).

Costa Rica's current strategies define two overarching objectives for the agricultural sector: to reduce poverty and to increase productivity growth. To achieve these goals, the short-term strategy prioritises five policy guidelines (or "pillars"): (i) food security and sovereignty[3], (ii) the creation of opportunities for rural youth, (iii) rural territorial development, (iv) adaptation to and mitigation of climate change, and (v) the strengthening of the export-oriented sector.

As the agricultural sector works to achieve the objectives set by the government, two challenges have emerged: scheduled market opening and climate change. Costa Rica has committed under several trade agreements to phase out a range of agricultural protection measures over the next decade – this will require a strategy to manage the transition, to prepare farmers for competition and to assist those that will not be competitive. Climate change is also a growing concern for the agricultural sector – agricultural production is projected to be negatively affected by rising temperatures and increasingly severe disasters in the coming decades.

General services to promote productivity are a key feature of agricultural budgetary support

Most of Costa Rica's government budgetary support for agriculture – 80% in 2013-15 – goes to general services to the sector, such as extension, irrigation investment, animal and plant health, rural development projects, marketing and promotion, and market information (Box 2). The share of general services in *total* support – measured by the GSSE and Total Support Estimate (TSE) – at 12% is in line with the average for OECD countries (also 12%) (OECD, 2016b). General services benefit the sector as a *whole* and are much less distorting than measures that directly influence farmer production or input decisions.

However, the majority of support provided to Costa Rican farmers is in the form of domestic and trade policy instruments (Box 2). Domestic policy instruments include price support measures, minor input subsidies and few payments for environmental services. Trade policy instruments include tariffs, tariff-rate quotas, import licences and sanitary and phytosanitary measures. Much of the support comes from price support and tariffs, both of which are highly market- and trade-distorting.

Box 2. **Overview of agricultural policy instruments applied in Costa Rica**

Domestic policy instruments

Costa Rica has maintained an administered minimum price for rice over recent decades. Reforms to the minimum price took place in 2015, when it became a **reference minimum price for rice**; however, in reality, the reference price continues to function as a minimum price – although it should be noted that the reforms are still relatively recent. The reference minimum price is based on a domestic production costs analysis by the National Rice Corporation (CONARROZ). Costa Rica has one of the highest domestic rice prices in the world. Consumers, particularly those with fewer resources, which include small-scale rice farmers, allocate a significant portion of their income to purchase this staple at a price higher than the international market price.

Subsidised credit interest rates. Some minor implicit credit subsidies, derived from preferential interest rates are delivered through the Development Bank System (SBD). SBD provides different types of credit to farmers, including working capital and loans for marketing, and for investment such as the acquisition of machinery and equipment. Public institutions like the Rural Development Institute (INDER) and ICAFE, the organisation representing the coffee sector, also provide limited credit to smallholders at preferential interest rates.

Implicit insurance subsidies were provided to producers by the National Insurance Institute (INS) until end-2015. Although there were no subsidies for premiums, INS was prevented by law from making profits from the sale of agricultural insurance, resulting in an implicit subsidy reflected in cheaper insurance rates for producers. This restriction has now been abolished, however.

Subsidies for fixed capital formation are provided through several programmes: 1) Production diversification is a programme managed by the Ministry of Agriculture and Livestock (MAG) and implemented only in the Sixaola area. It provides subsidies for the purchase of machinery or equipment for production projects, with the aim of diversifying the production portfolio of small farms and promoting other sources of employment; 2) Transfers managed by MAG are provided to farmers for investment in production projects. Farmers must contribute to the total cost of the project, and transfers are provided through auctions where farmers compete to obtain the subsidy; 3) A programme managed by INDER provides subsidies for fixed capital formation to poor smallholders for the creation of auto-consumption production modules; 4) SENARA finances on-farm irrigation investments through the Irrigation of Small Areas programme (PARD). For small-scale and poor farmers, SENARA pays the total cost of the investment. For medium and large-scale farms, SENARA makes a partial contribution.

Direct payments for environmental services: The Costa Rican government's agri-environmental policy includes direct payments for environmental services through the following funds: 1) The National Forestry Financing Fund (FONAFIFO), implemented by the Ministry of Environment and Energy (MINAE), promotes forest environmental services, and has played an important role in the recovery of the country's forest area. FONAFIFO finances the programme (PSA) that provides financial recognition to farmers for environmental services – both environmental protection and improvement. 2) The Recognition of Environmental Benefits for Organic Production (RBAO) for organic producers is a direct payment for a maximum period of three years. 3) MAG has a small fund for the "Programme of recognition of environmental benefits" (*Programa de reconocimiento de beneficios ambientales*), for the use of "green or living" fences and terraces, and soil condition improvement under agreements with small and medium-scale producers. 4) The Costa Rican Electricity Institute (ICE) a government-run electricity and telecommunications institution, provides supplies and material through the Basin Management Programme to farmers that develop activities and projects that ensure the sustainable use of natural, social and economic resources in an integrated and participatory approach.

Box 2. **Overview of agricultural policy instruments applied in Costa Rica** *(cont.)*

General services provision

Agricultural R&D is governed by the National Institute for the Innovation and Transfer of Agricultural Technology (INTA), that manages the agricultural R&D and innovation system.

Agricultural extension services fall within the competence of MAG. The provision of these services does not involve direct payments to producers or processors. It includes services such as general and specialised training, and extension and advisory services that facilitate the transfer of information and research to producers.

Plant health is supervised by the National Phytosanitary Service (SFE). Most of the services provided by SFE have to be paid by the farmer. **Animal health** is supervised by the National Animal Health Service (SENASA). As in the case of SFE, most of the services provided by SENASA are paid by farmers.

Farmer fairs (*Ferias del Agricultor*) seek to link producers and consumers.

Costa Rican agricultural sector maintains a **market information system** called InfoAgro. Costa Rica's Export Promotion Agency (PROCOMER) is responsible for the **promotion of Costa Rican exports**, including agricultural products.

Irrigation programmes are conducted by the National Irrigation and Drainage Service (SENARA). There are two types of programmes: off-farm programmes that involve large-scale irrigation works and on-farm programmes involved in the construction of private irrigation and drainage projects. For the former, SENARA manages the Arenal Tempisque Irrigation District (DRAT), a large-scale public investment. SENARA also finances private irrigation investments through the abovementioned PARD programme.

Rural territorial development is carried out by INDER, with two main areas of action: 1) land management and regulation, covering land acquisition, assignment and titles, and ensuring rural settlement on land distributed by the state; and 2) territorial development management, which includes development of rural infrastructure projects, organisational and entrepreneurial management, and rural credit – at preferential interest rates to finance services, agriculture, livestock, small-scale rural industries, trade, and ecotourism.

Costa Rica maintains **tax exonerations** for some sales taxes on staple food products, agricultural machinery, some veterinary products and agricultural inputs. Tax and financial incentives are provided for organic farmers. A tax exemption is also applied to activities included in the Free Trade Zone Regime (RZF), including for selected agricultural products.

There are no direct subsidies for **consumers** related to agriculture. Nevertheless, Costa Rica has several programmes for **social protection**.

For the period 2013-15, about 48% of total GSSE outlays were allocated to agricultural knowledge and innovation systems (more specifically, 33% to extension services and 15% to R&D). Development and maintenance of infrastructure (in particular, irrigation and farm restructuring) accounted for 32% of total GSSE outlays, and inspection and control services accounted for 14%. Together, these three categories represent 94% of the total GSSE budget.

Trade Policy Instruments

Import tariffs are the main instrument for trade protection in Costa Rica's agricultural sector, although these have declined since Costa Rica joined the WTO in 1995. Between 1995 and 2014, the Most Favoured Nation (MFN) average tariff for agricultural goods decreased by 31%. However, the average MFN tariff for agricultural goods in 2014 was 11.5% – more than twice the average MFN tariff for total trade and industrial goods. Agricultural products are mainly imported duty-free (38% of agricultural tariff lines), or with tariffs lower than 15% (51%). However, tariffs on selected agricultural products are very high, with applied MFN tariffs of 151% for poultry; 66% for dairy products; 46% for both pork meat and sugar and 36% for rice. Almost all imports from the Central American Common Market (CACM) (Panama excluded) enter Costa Rica duty-free, with the exception of sugar and coffee.

Box 2. **Overview of agricultural policy instruments applied in Costa Rica** *(cont.)*

Costa Rica has **tariff quotas** for 27 agricultural products. The Ministry of Foreign Trade (COMEX) allocates quotas based on historical record – 80% of the available volume is assigned to applicants that have already imported under the quota during the previous calendar year. The quota is issued in proportion to their participation in total imports under the quota. The remaining 20% is issued to new applicants on a pro rata basis. Apart from dairy products, use of quotas has been low, as tariff quotas with better conditions were negotiated under Free Trade Agreements for almost all products. Costa Rica applies preferential import tariff quotas for agricultural products from Canada, China, the United States, the Dominican Republic, Panama, the European Union, Peru and Colombia under the corresponding free trade agreements.

Licences or authorisations – generally related to health and phytosanitary protection, public safety and environmental protection – are required to import certain goods. In most cases, import licences must be obtained through the Single Window for Foreign Trade (VUCE). Since its launch in 2011, the VUCE 2.0 System automates 100% of import and export procedures year-round in order to reduce time and costs for users.

Sanitary and phytosanitary (SPS) measures on imports and technical regulations are carried out by SFE in conjunction with the Ministries of Trade and Customs and MAG. Since 2007, Costa Rica has adopted 125 technical regulations, most of which are related to products such as pesticides, fuels, medicines, textiles, cosmetics and food. Many of these regulations were issued under the General Treaty on Central American Economic Integration. Costa Rica has also continued to strengthen its infrastructure and institutional capacity to implement SPS measures, with the aim of facilitating trade while protecting the country from pests and diseases

Key challenges for the development of agricultural sector and productivity growth

Enhancing service provision begins with improving institutional efficiency and policy co-ordination.

The agricultural sector is governed by a complex public institutional structure, consisting of eleven institutions under the Ministry of Agriculture and Livestock (MAG) (Box 3). These institutions enjoy varying degrees of autonomy, and some have mandates that are established by legislation, posing challenges for MAG in co-ordinating activities across the Agricultural Public Sector (APS).

Complex and weak co-ordination among the APS institutions impedes effective service provision. While CAN was originally established to facilitate co-ordination across the sector, it has not been active for a number of years, and information-sharing across institutions remains limited. Co-ordination is weak, in part, because of the fragmentation of authority across institutions and the MAG's limited authority to play an overarching co-ordination role: some institutions are attached to MAG, but others are decentralised and, moreover, may have their own separate legislative mandate and the ability to generate their own resources through the sale of services. Effective governance is also impeded by the fact that the agricultural sector and its institutional structure are regulated by several hundred laws and ministerial decrees. The government is now making a number of efforts to address these challenges, and several institutions are currently reviewing their functions and operational structure – including MAG, INTA, SFE and CNP – in an effort to strengthen co-ordination among themselves.

Co-ordination challenges also extend to **sanitary and phytosanitary measures (SPS)**. SPS issues are not always promptly resolved, due to fragmented co-ordination across SFE, SENASA, the Ministry of Health and the Ministry of Trade. Given the perishable and higher-value niche product nature of many of Costa Rica's agricultural exports, and the tensions that have arisen with trading partners over SPS measures, effective dialogue mechanisms and co-ordination mechanisms to resolve SPS issues in a timely manner are critical.

Box 3. **Institutional Structure of the Agricultural Public Sector (APS)**

The **Agricultural Public Sector (APS)** is comprised of eleven institutions which fall under the responsibility of the Minister for Agriculture. One of these institutions is the Ministry of Agriculture (MAG), which is responsible for the management of the APS and the formulation and implementation of agricultural policies, as well as the agricultural extension system.

Of the eleven institutions in the APS, five are under the direct control of MAG: The National Institute of Innovation and Transfer of Agricultural Technology (INTA), the National Animal Health Service (SENASA), the State Phytosanitary Service (SFE), the National Seed Office (ONS) and the National Council Club 4-S (CONAC). These institutions receive financial resources from MAG, with the exception of SFE, which is largely funded by user fees. Only two of these institutions – ONS and INTA – have their own Board of Directors, while the others are governed directly by MAG.

The other five institutions in the APS are decentralised and have an important degree of political independence. These are: The Rural Development Institute (INDER), the National Production Council (CNP), the National Irrigation and Drainage Service (SENARA), the Comprehensive Agricultural Marketing Programme (PIMA), and the Costa Rican Fishing Institute (INCOPESCA). PIMA and INDER are financially independent from MAG, but the others may receive transfers.

In addition to these eleven institutions, the Minister for Agriculture is also responsible for five other administrative and co-ordination bodies: the Executive Secretariat for Agricultural Sector Planning (SEPSA), the National Agricultural Council (CAN), and the Agricultural Sectoral Technical Committee (COTECSA); and the working bodies for public-private dialogue and consultation for joint solutions (the Joint National Forum, the Joint Regional Forum, and the Regional Agricultural Sector Committees, CSRA). The most important body is the CAN, a consultative advisory and sectoral co-ordination body that approves the agricultural sector plan. The Minister for Agriculture also chairs the National Joint Private-Public Forum and the Regional Joint Private-Public Forum, stakeholder bodies comprising representatives of organisations representing small and medium agricultural producers.

The **agricultural private sector** is represented by a range of supply chain organisations. Some, called "corporations" (*corporaciones*), have important government involvement, having been created by legislation and with the Minister for Agriculture as a member of the board of directors. There are six corporations: ICAFE (for the coffee sector, as mentioned in Box 2), LAICA (for the sugarcane sector), CORBANA (banana sector), CORFOGA (livestock sector), CONARROZ (rice sector, also mentioned in Box 2), and CHN (horticulture sector). Corporations have an important role in the negotiation of policies and in the provision of services to agriculture, and some have also been in charge of implementing public agricultural policies. Although the corporations initially received some government support, they are currently solely funded by their members.

Co-ordination issues also contribute to **excessive bureaucracy**. In particular, the registration process for a new agrochemical can take up to four years – more than double the registration period in most other Latin American countries. Although extensive controls are aimed at environmental protection, long registration periods actually slow the introduction of more efficient inputs and leave outdated inputs in use longer than necessary. Long waiting periods for procuring licenses – for instance, to change crops, diversify into processing or to dig a well – also impede productive decisions: licence applications can take 2-3 months in the best case scenario, and up to 6-12 months when several ministries are involved.

In addition, low levels of **budget execution** by some institutions are contributing to broader **challenges in implementation**. Budget execution rates average 80% across all institutions of the APS but some disburse considerably less. The timeframe of the national budget planning and the late arrival of resources to certain institutions means that several programmes are not implemented on time or not at all (e.g. some INDER and INTA programmes). Coupled

with implementation challenges resulting from weak co-ordination and heavy bureaucracy among public agencies, services provided to farmers are limited and not always timely.

Moreover, the allocation of **budgetary resources** within the agricultural sector does not seem to match the importance that the government assigns to each objective and pillar. Only a small budget allocation is directed towards agriculture innovation systems, while resources for agricultural infrastructure, market information systems and a strategic information system for the sector are also very limited. The absence of systematic impact assessment of public expenditure in agriculture – particularly in the provision of services – makes it difficult to determine whether the budget is being allocated where it can have the greatest impact. Finally, potential investment in the agricultural sector is limited by the intensification of budgetary restrictions since 2013 in line with Costa Rica's fiscal situation.

Strengthening the effectiveness of general services will be key for raising productivity.

Extension services are a core function of the APS, but capacity constraints and misallocated resources constrain their effectiveness. Although extension services receive nearly one-third (30%) of the MAG budget, personnel lack sufficient training, for instance, in new production systems, and managerial capabilities. The growing deficit in technical capacity is partly due to the age of most of its employees – 32% of staff are eligible to retire in the next three years – as well as to the non-renewal of technical positions: only one new hire is allowed for every seven retirees. The inclusion of numerous administrative tasks within the responsibilities of technical personnel also limits the effectiveness of service provision, as extension staff are often diverted from core advisory tasks. Extension services also suffer from limited co-ordination between R&D, knowledge generation and farmers' needs.

Agricultural innovation – a key determinant of productivity growth – is constrained by (i) low expenditure on **research and development** (e.g. INTA receives only 1% of the total APS budget), (ii) a fragmented research agenda and (iii) limited integration with extension services. Agricultural research is also undertaken by universities and agricultural supply chain organisations, among others – however, research agendas are not co-ordinated, and results are not systematically shared. Furthermore, information-sharing between farmers, INTA and the Extension services programme is not institutionalised. The government has taken recent steps to address this, issuing a set of guidelines in 2016 with the aim of improving co-ordination between INTA and Extension services and better meeting producers' needs.

Costa Rica is working towards a **risk management** approach, though agricultural insurance is still in the early stages of development. In line with the "National Risk Management Policy 2016-2030", the National Commission of Risk Prevention and Emergency Response (CNE) works closely with the agricultural sector to assess current risks, reduce risk exposure, and prepare for emergency response. Such efforts include monitoring of weather phenomena in high-risk areas and management of a public online portal to bring together data generated by universities and research centres. CNE also operates an early warning system with support from active community participation (Sancho, 2016). Moreover, in the event of a disaster, CNE provides some financial support to farmers; this includes access to financing (or extended loan periods) and provision of inputs, machinery and emergency cash payments. At the same time, agricultural insurance markets are underdeveloped in Costa Rica. For several decades, crop insurance was provided almost exclusively by INS – the former state insurance institution – to rice producers. In 2015, INS initiated efforts to expand its coverage, with a crop insurance product for several of Costa Rica's main crops. Currently, only 1.3% of agricultural land is insured, but plans for expansion are under development.

Public-private efforts, such as by sector *corporaciones* (agricultural supply chain organisations or "corporations", see Box 3), complement a number of government services, including technical assistance, research, supply chain development and marketing for certain products. These services have had a positive impact on the development of sectors such as coffee, banana, and sugar cane. However, not all farmers have access to the support provided by corporations: less than 30% of total farmers belong to any type of farmer association, including corporations (INEC, 2014).

Broader constraints in the enabling environment also need to be addressed.

Infrastructure, in particular transport infrastructure, is identified by various indices[4] as one of the strongest constraints to Costa's Rica's competitiveness, and poor road, warehouse and irrigation infrastructure constrain agricultural productivity. Limited investment in the transport system, combined with increasingly severe natural hazards, has led to the deterioration of roads: while investments in the 1960s and 1970s resulted in an extensive road network, road quality is now ranked below the Latin American average (WEF, 2015). The poor quality of rural roads increases transport costs and production losses, constraining the competitiveness of large producers and preventing small-scale producers from accessing markets. The lack of distribution centres and cold-chain facilities in certain regions is also increasing transport costs and limiting the ability of producers, including smallholders, to connect to marketing chains. Lastly, poor development of agricultural infrastructure, such as drainage and irrigation, is also decreasing productivity at farm level – a problem set to worsen with increasing natural disasters resulting from climate change.

Access to **financial tools** is also limited. In particular, access to farm credit is very low, ranking below other Latin American countries such as Chile, Mexico, Brazil and Colombia. In 2014, less than 14% of farmers received financing. The Banking Development System (BDS) was established in 2008 to improve access to finance, with preferential interest rates for qualifying farmers, but bank financing remains insufficient. Stringent requirements impede small-scale farms from taking advantage of available credit sources, and private commercial banks lack incentives to enter the market. As discussed previously, the market for agricultural insurance is also underdeveloped, but expanding.

Increasing value from agriculture also means exploiting opportunities to expand niche products.

The Costa Rican government has prioritised strengthening of exports and increasing the contribution of agriculture to the economy. With land availability constrained, increased value from agriculture rests on further exploiting Costa Rica's niche in producing premium products and its strong reputation for environmental awareness. Key opportunities for the next wave of export success lie in the expansion of niche or differentiated products, such as organic produce and the further development of the processed foods industry. Both these areas also have the potential to reduce dependence on existing concentrated export commodities and to increase employment in rural areas, including – in the case of food processing – for relatively low-skilled labour moving out of agricultural production.

Organic production is a niche market that can capitalise on the sector's reputation for both quality and sustainability. However, despite being an early mover in this sector – the first law related to organic production was passed in 1995 – organic production remains limited, at around 1.6% of total production (PEN, environmental database 2016; SFE 2015). Costa Rica's share of organic production area is below the world average, and lower than

in many other countries in the region (FAOSTAT, 2016). Contributing factors include underdeveloped marketing, distribution and commercialisation channels; lack of public and private support, in the form of extension services and innovation systems; and lack of confidence by producers that they will attract the price premium for organic produce (PEN, 2015a; IBS Soluciones Verdes, 2013).

The **agro-industry** is growing, but there is scope for further expansion. Processing enterprises also exist for other products – meat and meat-products, fruits and vegetables, dairy products, soft drinks and juice, confectionary and chocolate, and fish and seafood processing (USDA, 2015) – but not all are well-developed. The government is also currently exploring opportunities for diversification into new by-products, for instance, such as those from palm and rice, to further develop agro industry.

International linkages have been an important factor in the expansion of Costa Rican exports to date and will continue to be key for the promotion of agricultural exports. Encouraged by Costa Rica's open investment policy, investment from international companies has helped to strengthen integration within international markets, and changed the production structure of the sector towards export crops. Foreign investment is particularly high in the cultivation of bananas, pineapples and palm – more than 50% of plantations for these crops are controlled by foreign investors (FAO, 2010a). International linkages in more processed products and non-traditional tropical fruits are currently more limited and could be encouraged through more investments in, for example, technical assistance and agricultural infrastructure, as well as efforts to promote contract farming schemes and strategic alliances with international partners to further integrate into international markets, as well as market development efforts.

Promoting rural development and reducing poverty will require greater efforts to foster the inclusion of smallholders, where possible, and options outside of agriculture over the longer term.

The Costa Rican government has highlighted **rural development** as a critical priority for the agricultural sector. This requires attention to the needs of smallholders across the range of issues identified in this review: improved general services, such as extension and market information; better infrastructure and access to finance; and the development of value-added markets. Efforts are also needed to ensure the effective integration of smaller producers into supply chains, along with increased investment in skills and education.

Service provision is a critical foundation for inclusion, but the aforementioned challenges in extension – limited technical capacity and competing responsibilities for advisory staff – dilute the benefits of extension for poor farmers. The uneven distribution of market information also constrains agriculture development. While agricultural supply chain organisations can complement public services, public-private efforts are not co-ordinated and overall service provision remains insufficient.

Broader **enabling environment** factors, such as infrastructure and access to finance, also have implications for inclusion. Recent investments in infrastructure notwithstanding, poor quality rural roads are a particular barrier to access to markets by smallholders, particularly in flood-prone regions. Insufficient distribution centres and cold chain facilities in certain regions are another key obstacle to the connection of poor farmers to markets. Moreover, limited access to credit and insurance are particularly debilitating for smallholders, constraining investments and impeding income-smoothing.

Inclusion is additionally limited by the **uneven integration of smallholders into supply chains**. Linkages between small-scale producers and agro-food chain actors further downstream do exist for a few products, coffee in particular: with support from the agricultural organisation ICAFE, many coffee producers are involved in bean processing, marketing and exporting, for example. However, other products – including those with large industries, such as pineapple and banana – do not include small-scale producers in commercialisation. Limited skills, barriers to credit and insufficient organisation preclude smallholders from participating in the early stages of processing. Finally, the uneven development of regional markets also impedes market access for small-scale producers.

In other cases, productivity growth and opportunities for small-scale producers are also constrained by limited **competition** in supply chains for certain products. For example, the sugar and rice sectors have concentrated market structures. According to Law 7818, LAICA, the sugar producer association, can regulate all activities involved in the supply chain, from the purchase, import, export, storage to the commercialisation at retail level of sugar in Costa Rica. The same situation is observed in the rice sector: CONARROZ (Law 8285) fully controls the rice market. This lack of competition impedes the competitiveness of the sectors and reduces opportunities for smallholder producers.

Lastly, low **education levels** in rural areas impede inclusive agricultural growth. While decades of investment in public education and healthcare have resulted in near universal access to these services, at times, Costa Rica's educational outcomes for the agricultural sector are poor, particularly among those employed in traditional agriculture. Compared to the national average of nine years, the average school level of those employed in agriculture for the domestic market and the traditional export sector is 5.5 years and the average school level of those employed in the non-traditional agricultural export sector is 6.1 years (PEN, 2013). The low skill and educational levels of the rural workforce pose challenges for the improvement of agricultural productivity and movement up the supply chain. For example, while shifts into organic production have the potential to increase smallholder involvement in supply chains, these producers can face challenges in adopting new practices and meeting standards. Low skill and education levels also impede the movement of labour out of agriculture, posing challenges for adjustment.

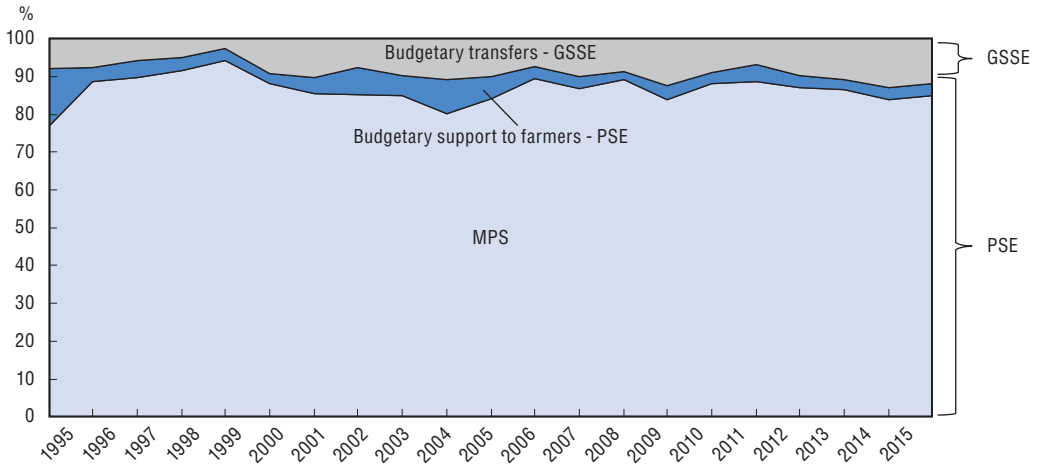
Indeed, ultimately, not all smallholders will survive within the agricultural sector (not least due to rising fragmentation of farms), so attention needs to be given to issues of **adjustment** for this group in the context of the larger structural adjustment process in the sector and the economy. These include declining share of agriculture in GDP as the economy develops and diversifies and a declining share of agriculture in employment as some labour is released from the sector and labour demand in non-agricultural sectors increases with, all the time, rising agricultural output. For some smallholders improving productivity and competitiveness is a viable option (which may also need to involve some means for consolidating the outputs of smaller farms). For others, diversifying income sources (within and outside of the agricultural sector) will be critical; and for an important number leaving the sector altogether for non-agricultural jobs will be the only feasible solution. This implies an important role for social policies in addressing the needs of those unable to adjust (discussed further below), as well as improvements in rural education to position rural communities to create and take advantage of new income alternatives (e.g. Costa Rica has a strong base of ecotourism on which to build in this regard). Government policy to address rural poverty cannot only focus on agriculture-led development; agricultural policies need

to be situated within broader rural development policies aimed at creating non-agricultural opportunities in rural areas and avoid mass migration to the cities (OECD, 2008, 2012).

Tackling poverty also means addressing some existing policies that harm poor households and hinder a managed transition to more open markets.

While Costa Rica's overall level of support to agricultural producers is relatively low, it takes a form which is particularly damaging to efforts to tackle poverty and promote smooth adjustment to changes in markets or the climate. Market Price Support (MPS) was the largest component (85%) of the total support estimate (TSE) to agriculture in 2013-15 (Figure 5). Budgetary transfers, on the other hand, have been relatively small (15%). General services (as measured by the GSSE) is the predominant category of budgetary transfers (80%).

Figure 5. **Level and composition of Total Support Estimate in Costa Rica, 1995-2015**



Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink *http://dx.doi.org/10.1787/888933451442*

Producer support, as measured by the PSE, generated an average of 10.1% of gross receipts of agricultural producers in 2013-15. While this is not high compared to the OECD average of around 17.6%, this support is almost entirely (97%) based on the most trade distorting form: MPS. While aimed at food security and enacted through a reference price for rice and tariffs on several products (products contributing the most to MPS are rice, poultry, pigmeat and sugar), this support has a number of negative consequences for the objective of reducing poverty.

First, producer support for rice is imposing a significant **burden on consumers, especially the poorest**. Costa Rica has one of the highest domestic rice prices in the world. Consumers – low-income households in particular – allocate a significant part of their income to purchase this staple at prices higher than in the international market. According to the Consumer Support Estimate (CSE), policies to support agricultural prices generate an implicit tax on consumers (first buyers of the product), and increased expenditure on consumption by 21% in the (2013-15 period). As poorer households spend a higher proportion of their income on food, this in effect functions as a regressive tax, and, contrary to the stated aim, it has the effect of weakening the food security of poor households.

Second, the current support measures primarily **benefit a handful of large landowners and rice millers**. Rice production is dominated by large scale farms, which account for more than 76% of the planted area (INEC, 2014), while small farmers largely (72%) produce for their own consumption. Moreover, as many small-scale rice farmers are net *buyers* of rice, they are actually harmed by the higher prices for this staple food. This preferential support is drawing resources away from productive and sustainable activities. It also risks slowing the process of adjustment in the sector, a process that is needed given scheduled liberalisation under free trade agreements.

Costa Rica has committed to **phasing out tariffs** under the CAFTA-DR by 2025. In this context, the current producer support for rice impedes the smooth management of the adjustment challenge for producers – not all of whom will be competitive in a more open market – and reduces incentives for rice producers to adopt more efficient practices. Experience suggests that smooth adjustment can be facilitated by:

- **Clear signals of policy direction**: Clear signals from the government about future support measures are important in ensuring informed decision-making by farmers about their prospects for remaining competitive in a more open market. Reforms to the minimum price took place in 2015, when it became a *reference* minimum price, however, in reality; this reference price continues to work as minimum price. While this reform is still new, to date there is no foreseen timeframe for phasing out this reference price.
- **Gradual phase-out of market support**: The gradual phase-out of market support creates incentives to increase efficiency and become more competitive prior to market opening. The tariff phase-out has a set timeline, and the government is now taking specific measures to indicate that support will decline. Subsidised insurance policies for rice producers were cancelled in 2015, for example, and in 2019, SENARA will eliminate cross-subsidies from other crops to rice producers in the water pricing system.
- **Efforts to increase productivity growth:** Increases in the range and effectiveness of services for farmers, R&D and extension services include; the provision of support for farmer organisations and co-operatives; improved infrastructure; and access to timely and affordable financing and tools for fostering resilience and risk management are all key to enabling producers to be well-positioned to face increased competition.
- **The fostering of alternative opportunities for those unable to compete:** Support for supply chains and services from co-operatives are only available for certain crops in each region, and technical assistance and financial incentives to encourage diversification into alternative products are not readily available. To date, targeted programmes to develop the rural non-farm economy – in particular, by facilitating shifts into ecotourism or agro-food processing – are limited.

While there has been good progress on climate adaptation, untapped opportunities remain.

Climate change-induced losses in agricultural production are projected to reduce agriculture's contribution to GDP by between 8% and 12% by 2100, relative to 2007 (Ordaz et al., 2010). In recognition of the agricultural sector's vulnerability to climate change, the Costa Rican government is already making noteworthy strides to promote adaptation among farmers. Nevertheless, there remain untapped opportunities for further development to achieve the sector's objectives of productivity growth and poverty reduction in a changing climate. Both progress and remaining challenges can be seen across four dimensions of adaptation policy: (i) strategic prioritisation, (ii) information generation and dissemination, (iii) rule-based regulations, and (iv) financial incentives.

Costa Rica has identified adaptation as a key political **priority** in several strategies, although misalignment with other objectives and mismatched funding limit its implementation and impact. Costa Rica has prioritised adaptation in national and sectoral strategies. Adaptation measures may also benefit indirectly under the government's integrated approach with sustainable development and mitigation. At the same time, progress has been slowed by misalignment with other priorities – such as food sovereignty – which promote the production of crops that are not adapted to the changing climate of all regions. Moreover, budget allocations do not cover all of the adaptation-related objectives identified by the government, limiting the sector's capacity to adapt.

Noteworthy steps can be seen in both **information generation and dissemination** about vulnerability to climate change and adaptive solutions, but an adaptation research agenda has not yet been developed, and dissemination to farmers is limited. A range of public and private institutions are researching some adaptive solutions, yet vulnerability assessments for Costa Rica's main crops remain incomplete. Moreover, a co-ordinated, cross-institutional research programme on adaptive solutions is lacking, with institutions pursuing fragmented research activities. While a number of programmes are ongoing on dissemination and technical assistance, farmer awareness about long-run climate changes and adaptive solutions remains uneven. Reasons for this include a focus on current vulnerabilities, co-ordination weaknesses and capacity shortfalls in government institutions, and public resource misallocations.

Many **rule-based regulations** indirectly affect adaptive practices. However, their impact is often limited by the absence of clear adaptation objectives, in addition to limited implementation and lack of enforcement. For instance, while a number of environmental regulations to ensure land and soil quality have helped to improve resilience against extreme events, their impact has been hindered by implementation challenges. Other recent reforms have strengthened water resource management, but co-ordination and monitoring and enforcement challenges reduce the impact of these improvements. In addition, climate-proofing of infrastructure is encouraged, but not mandated, for private projects – an important oversight that leaves the agricultural sector exposed to significant losses. Finally, farmer efforts to adapt through crop diversification are impeded by lengthy permit application processes.

Lastly, most of Costa Rica's **financial incentives** are non-distortive measures and may generate positive spillovers for adaptation if complemented with information on climate change projections. Costa Rica is a model of good practice in terms of avoiding most input subsidies – financial incentives which can have a distortive effect on adaptation. Adaptation could also be indirectly encouraged through a number of other financial incentives. For instance, environmental benefits programmes, Nationally Appropriate Mitigation Actions (NAMAs) and credit schemes may indirectly stimulate a wide range of adaptive measures; although they focus on current vulnerabilities and do not factor in climate change projections. Recent developments in Costa Rica's agricultural insurance programme have also removed a number of barriers to adaptation – some remaining distortions notwithstanding. However, other incentive-based regulations – namely, reference prices and trade restrictions – distort incentives and may encourage maladaptive choices.

Policy recommendations

Drawing on the analysis undertaken in this *Review*, this section proposes measures to support the government's efforts to promote productivity growth and tackle poverty in the context of market opening and climate change.

The first set of recommendations focuses on **increasing productivity** through improvements in the effectiveness of services provided to farmers, the enhanced efficiency of governmental co-ordination and budgetary execution, the strengthened role of the private sector and agricultural supply chain organisations, and the addressing of constraints in the broader enabling environment – notably in infrastructure and access to finance. Enhanced productivity underpins efforts to combat rural poverty amongst farm households, ensure the ongoing competitiveness of the agricultural export sector, position producers to compete in more open markets, and strengthen the resilience of the sector to climate change.

The second set of recommendations identifies opportunities to **enhance value and inclusiveness** in the agricultural sector. The recommendations initially focus on new opportunities to expand agricultural exports into higher-value, niche products, capitalising on Costa Rica's strong environmental record and reputation. They then address the need to increase the share of value captured by producers, and to promote the greater inclusion of smallholders into marketing chains through reforms to these chains and improvements to rural education and skill levels. Together with recommendations on productivity, these aim to create a competitive, productive and inclusive agricultural sector that is better positioned to meet new market and climatic conditions.

The third set of recommendations focuses on **aligning incentives and promoting adjustment** to market opening. Recommendations focus on the need for clear and credible signals of policy direction, coupled with phased market opening, in order to provide the right signals and incentives for producers regarding the future of the market. Recommendations specifically address the issue of market price support for rice, and the need to address the perverse incentives created for rice production and the negative impact of this policy on poor households. Effective transition planning also requires the provision of adjustment support for those farmers that will not be competitive under more open market conditions.

Lastly, a final set of recommendations proposes a number of opportunities to further develop the agricultural sector's efforts to **adapt to climate change**. These build on Costa Rica's already active engagement by proposing better alignment of policy and funding with longer-term adaptation needs, strengthening awareness of climate vulnerability and adaptation options, improving the enforcement of key regulations, and using existing financial tools to incentivise adaptive behaviour.

Where possible, the recommendations suggest those measures which may be tackled more readily in the short-term and those that are likely to be more focused on in the medium- or longer-term. These also sometimes reflect areas where the agricultural sector has primary responsibility and those where other ministries may play a greater role. These recommendations are not exhaustive, and should be interpreted as a starting point for government consideration, refinement, and further elaboration.

1. *Increasing productivity*

Increase the effectiveness of government services to the agricultural sector

- **Review and reform extension services to increase their effectiveness**. Given the current shortage of technical capacity and the misallocation of resources to non-advisory tasks, an evaluation could be a useful first step to identify where increases in technical staff and skills are most needed. Limits on the replacement of retirees, while constraining human resources at present, also create an opportunity for skill renewal and restructuring.

- **Strengthen public R&D and its connection with extension services**. The enhancement of the agricultural innovation system is crucial for the achievement of sustainable productivity growth. Moreover, strengthened linkages between R&D and extension services provided to farmers will increase the relevance and impact of research findings. There is a need for greater budget prioritisation of agricultural R&D, matched by efforts to replicate successful public-private partnerships with agricultural supply chain organisations on R&D and technology transfer for specific crops. Increasing efforts on international co-operation are both a relatively cost-effective and important way of supporting innovation, both in terms of R&D per se and in terms of learning from others with a view to technology adaptation.
- **Reduce red tape**. Slow and complicated bureaucratic procedures curb productivity growth. Shortening the registration process for agrochemicals is critical in the short-term, given the very low rates of approval and complaints by both trading partners and domestic producers about lengthy, onerous and unpredictable processes. Some trading partners have also complained about the system for importing registration resulting in a lengthy process, as well as the delays in the emission of sanitary import permits. There is also a need to shorten and simplify applications for permits to change crops and establish small-scale processing businesses. For example, the online permit application system that MINAE is currently introducing for water-related permits could be extended to other permit systems.
- **Bolster the role of agricultural supply chain organisations (e.g. *corporations*) to complement government services**. In principle, agricultural supply chain organisations provide a range of services, including research, extension, access to credit, training on international standards and regulations, legal advice, transport and storage, marketing and export. But in practice services provided vary across organisations, and there is scope to strengthen the role of these organisations in some sectors that are key for smallholders. For some products, new organisations could be developed; for others, such as livestock and palm, both the number of farmers covered and the range of available services could be expanded. A useful first step in the short-term would be an evaluation of the existing services provided by current agricultural supply chain organisations to identify gaps and overlaps. Based on this evaluation, targeted measures can be implemented to strengthen the role of these organisations as a strategic complement to public services in the agricultural sector.

Strengthen institutional co-ordination and budgetary mechanisms

- **Improve consultation and co-ordination mechanisms within the APS**. The large number of institutions in the APS risks fragmenting responsibility, slowing decisions and duplicating functions. Co-ordination among the APS institutions could be strengthened – in the short-term, the priority should be improving the operation of existing co-ordination mechanisms such as CAN.
- **A regular and systematic collection of strategic information** could also contribute to better co-ordinated decision-making by providing all participants with a common and up-to-date overview of the performance of the sector and a consistent evidence base for policy decisions. As the secretariat to CAN, SEPSA could serve as a logical collection point for such information. In the medium-term, a review could be undertaken of the mandates of institutions, in order to reduce duplication and ensure coverage of new challenges.

- **Strengthen dialogue mechanisms and increase transparency to resolve SPS issues efficiently**. Co-ordination between SFE and other institutions such as COMEX and customs in relation to SPS measures is currently limited. Improved co-ordination on SPS measures among the different agencies involved in agricultural trade could help to manage potential tensions with trading partners and domestic producers. Effective leadership and transparency are also key to improved co-ordination.
- **Improve budget allocation on key priorities**. Although 80% of budgetary expenditures go to general services, resources are limited for agricultural innovation, technology transfer and technical assistance programmes, agricultural infrastructure, agricultural product safety and inspection services, market information systems, food safety systems, animal and plant health, etc. Greater alignment of budgets with stated policy goals will be key to improving performance in the sector.
- **Increase budget execution**. Budget execution rates should be increased across agricultural institutions in order to maximise the impact of available resources. Timely disbursements of funds will enable better planning and improved service provision. Better co-ordination mechanisms within and outside the APS, could also help to reduce heavy bureaucracy that also hampers budget execution.

Strengthen the enabling environment for productivity growth and poverty reduction

- **Improve infrastructure**. A functioning transportation infrastructure is needed to connect producers to the processing industry and national and international markets. Improving the transport network – main rural roads, in particular – will help to secure market access, decrease post-harvest losses and encourage farmers to shift to fragile but higher-value products. Further development of regional warehouses would improve market access and income opportunities for smallholder farms. Lastly, efficient irrigation systems are also needed to ensure productivity growth and prepare for future water scarcity. To reconcile these investments with the current fiscal deficit, Public-Private-Partnerships could be sought.
- **Increase access to finance**. Increasing access to credit – through mechanisms that avoid moral hazard – is critical for boosting productivity growth amongst smallholders. Existing credit programmes by agricultural organisations could be expanded as a first step. Incentives and mechanisms can also be introduced for private banks to engage with small borrowers, for instance through the use of stored products in storage facilities as collateral. Moreover, stringent loan requirements for smallholders should be made more flexible.

2. Enhancing value and inclusion

Promote value-added production and reform marketing chains to boost producer share and smallholder participation

- **Enable diversification into niche or differentiated products**. The APS has identified organic products as an important growth market: demand for organic products is growing globally (already, 69% of organic production in Costa Rica is aimed at exports) and domestic opportunities are also increasing as the urban middle class grows and eco-tourism hotels and restaurants develop. Capitalising on these markets will require investments in the commercialisation of organic products. Products benefiting from Ecolabels have good export potential for Costa Rica, given the country's reputation for environmental protection and there are already initiatives upon which to build (such as Brand Costa Rica). Lastly, further development of by-products – such as frozen pineapple, and biofuels from rice straw – offers promising opportunities.

- **Integrate small-scale farmers into supply chains**. Smallholder (including women and youth) integration into supply chains is key to helping raise incomes. Agricultural supply chain organisations can play an important role; for instance, the ICAFE model of including small-scale farmers within the supply chain could be expanded to other crops, such as beans. Improving mechanisms to distribute market information – by increasing the coverage of current mobile phone information systems, for example, will also help small producers integrate into markets. Lastly, smallholder farmers could also be trained in the early stages of processing for certain products, such as slicing, packaging, drying or sugaring, etc.
- **Consider ways to foster greater competition within the market structure** in order to increase benefits for producers. The current low levels of competition in some agricultural markets is potentially constraining productivity and negatively impacting opportunities for small producers. Addressing competition issues in marketing chains are an important element to consider in the context of sectoral reform.

3. Reducing market price support and promoting adjustment

Send credible policy signals and manage the transition

- **Announce a timetable for the reduction of market support (e.g. rice reference minimum price)**. This should be a short term priority for action and front-loading of reform, given the negative impact that the current market price support for rice has on poor households and on the adjustment challenge in future.
- **Announce a timetable for phase out of agricultural tariffs to facilitate orderly adjustment**. Producer support is still provided in the form of tariff protection for several products, namely rice, poultry, pigmeat, milk and sugar, thus deterring the cultivation of more productive or more adaptive products. Costa Rica has signed several FTAs under which tariffs for a number of these products are due to be phased out[5]. Conveying to producers the precise timetable for a gradual phase-out of protection will aid forward planning.
- **Identify alternative paths for those that may struggle to compete**. Not all small-scale farms are economically viable or able to join marketing chains. Alternative economic opportunities in areas such as ecotourism or agro-food processing will be important to combat unemployment in the rural sector. Targeted information and assistance programs may be needed in order to help producers adapt and shift to non-farm economic activities.
- **Ensure sufficient social safety net measures for displaced farmers**. Building on Costa Rica's strong record of investments in and provision of social services, measures to protect and assist those displaced from agriculture may include both specific adjustment assistance and training, as well as ensuring continued access to health and education services in rural areas. Costa Rica's existing social protection programmes (such as the cash transfer programme operated by IMAS) could also play an important role. Agricultural policies need to be framed within an economy-wide approach including other policies (and ministries), such as regional initiatives (territorial economic development) and social development and protection. Economy-wide social programmes, like cash transfers, are more efficient, effective and targeted at transferring income to the poor than price policies or input subsidies.
- **Facilitate movement out of agriculture by improving rural education and skills**. The improvement of education in rural areas would create opportunities for a diverse range of economic activities in rural and urban areas, contribute to increasing incomes and facilitate movement out of agriculture as needed.

4. Adapting to climate change

Align objectives, institutions and funding with a longer-term perspective to prepare for climate change

- **Adopt a longer-term perspective in all objectives, to align with climate change goals**. A systematic evaluation of the extent to which agricultural policies are aligned with adaptation would help to maximise the impact of existing resources by strengthening synergies and minimising trade-offs in the long term. In particular, current objectives – such as food sovereignty – need to take future changes in climate vulnerabilities into account. The National Adaptation Strategy scheduled for 2018 may be a useful vehicle for this alignment process.
- **Improve co-ordination on the adaptation agenda**. Strengthened information sharing and co-ordination – in particular among IMN, DCC, MAG, agricultural extension and agricultural organisations – is needed to build momentum on the adaptation agenda. DCC's plans to expand across sectors, and MAG's initiative to mainstream adaptation across institutions are both important first steps. Within MAG, a clear lead should be identified for the adaptation agenda in the agricultural sector to co-ordinate adaptation initiatives. Agricultural supply chain organisations must also be better integrated into the adaptation agenda. The National Adaptation Plan could help to formalise responsibilities and strengthen co-ordination across institutions.
- **Strengthen alignment of adaptation spending and objectives**. Clear government roles and objectives should guide budget spending on adaptation. Tracking adaptation expenditures across the budget is difficult, but nevertheless key to revealing funding gaps. The systematic labelling of programmes with adaptive components is also a first step in a longer-term objective of evaluating Costa Rica's adaptation efforts through development of a monitoring and evaluation programme.

Strengthen awareness of vulnerability to climate change and adaptive solutions

- **Co-ordinate research efforts by universities and the private sector to develop vulnerability assessments and adaptive solutions for all major agricultural products**. Review of current public and private adaptation research and the development of an overarching research agenda are key to filling knowledge gaps and reducing duplication. Information-sharing across institutions should also be strengthened to facilitate this process – in particular, IMN's historical weather data and climate change projections should be made publicly available. A range of projects across the government, universities and agricultural organisations already focus on current vulnerabilities and could extend their scope if the necessary data is made available. Continued efforts to promote international co-operation will also help to expand the knowledge base on the vulnerability of the agricultural sector and opportunities to adapt.
- **Increase farmer awareness of the effects of climate change and adaptation by integrating adaptation into existing technical assistance programmes**. Extension services should systematically incorporate information on climate change vulnerabilities and adaptive alternatives (e.g. more resilient varieties, efficient irrigation techniques, alternative farming practices and crops) into current programmes. The provision of technical advice through mobile phones is one potential cost-effective tool to increase awareness. The National Strategy for Education and Development Communication on Climate Change proposed in the Third National Communication, produced by MINAE and IMN, could be used to advance such efforts.

Improve the enforcement of regulations to encourage adaptive behaviour

- **Strengthen the enforcement of regulations on soil quality and conservation**. Increased enforcement of land and soil regulations is needed to reduce vulnerability of the agricultural sector to climate change. The government's intention to conduct a comprehensive assessment of the legal framework and institutional responsibilities regarding soil legislation is an important first step.
- **Increase the monitoring, enforcement and co-ordination of water resource management**. As climate change exacerbates water stress, the improved monitoring and enforcement of water-related regulations is critical. Such efforts will require strengthened co-ordination across the broad spectrum of institutions involved, as envisioned by the current development of a joint SENARA, MAG and MINAE DCC strategy on water protection and maintenance.
- **Implement and enforce minimum standards for climate-proof infrastructure**. Climate change impacts are considered for public infrastructure projects, but private infrastructure projects remain unregulated in this respect. The enforcement of minimum standards for climate-proofing infrastructure is key to reducing economic losses during future extreme events.

Encourage adaptation through existing financial tools

- **Align existing voluntary payment programmes and direct payment schemes with adaptation**. Financial incentives that encourage maladaptive practices should continue to be avoided. Current financial incentives could also help to prepare farmers for climate change by incorporating explicit adaptation components. In particular, eligible programmes could be linked with region- and crop-specific climate change projections. These include the Recognition of Environmental Benefits of Sustainable Production programme, the NAMAs, preferential credit programmes, and direct payment programmes for low-income farmers to purchase farming equipment and invest in irrigation.
- **Continue to develop and align the new insurance programme with adaptation**. Insurance is important for enabling productive investments and for raising awareness of vulnerability to climate change and the need to reduce risk exposure. At the same time, by providing pay-outs when disasters occur, insurance also runs the risk of undermining incentives to choose more resilient agricultural products. The current agricultural insurance scheme could more closely aligned with adaptation and productivity growth by combining with area-yield insurance to develop a "hybrid" product to provide more timely pay-outs and reduce moral hazard. To limit the encouragement of maladaptive choices, coverage should continue to be priced according to risk exposure and should be accompanied by extensive information campaigns to raise risk awareness and continued efforts to increase take-up rates.

Notes

1. A higher number when compared to OECD average of 0.32 or to Denmark (one of the most equal countries) with 0.25, for the same year.
2. A goal of increasing agricultural value added share to GDP by 2 percentage points from 6% in 2014 to 8% in 2018 has been established.
3. The definition of food sovereignty used in the short-term strategy (Policies for the Agricultural Sector and Rural Territorial Development 2015-2018, p. 23) is: "*La soberanía alimentaria será entendida como el derecho que tiene el país de definir sus propias políticas y estrategias de producción sostenible, distribución, acceso, consumo y utilización biológica de los alimentos; así como promover legislación que garantiza el acceso*

a los recursos de producción para la pequeña y mediana agricultura; esto da prioridad a la producción nacional para la demanda local, respetando la diversidad cultural y la conservación de los sistemas productivos y la diversidad biológica. Para lograr este objetivo, el gobierno propone una política de fuerte apoyo a la pequeña y mediana agricultura productora de alimentos". [Food sovereignty will be understood as the right of the country to define its own policies and strategies for sustainable production, distribution, access, consumption and biological utilisation of food; and to promote legislation guaranteeing access to productive resources for small and medium agriculture; this gives priority to national production for domestic demand, respecting cultural diversity and the conservation of productive systems and biodiversity. To achieve this goal, the government proposes a policy of strong support for small and medium-scale agriculture].

4. Such as the World Economic Forum's *Global Competitiveness Index* 2015 and the Agricultural Growth Enabling Index-AEGI (OECD, 2014a).
5. For example, under CAFTA-DR (important trade partner), all agricultural products will have zero tariff by 2025 except potatoes and onions.

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Chapter 1

The agricultural policy context in Costa Rica

This chapter examines the key characteristics of the agricultural sector in Costa Rica. It includes a brief overview of the political, economic, social, and geographical factors that constitute the broad context for the development of the agricultural sector. The sector's role in the economy is outlined, including structural change over the last two decades, farm structure and producer characteristics and trends in agricultural productivity. The chapter concludes by examining trade flows in the agricultural sector, as well as the structure of upstream and downstream sectors and marketing chains at national level.

1.1. Introduction

Costa Rica's political, economic, social and environmental achievements over the past thirty years have been significant, providing favourable conditions for the development of the agricultural sector. The country's sustained economic growth and long-standing commitment to social development have resulted in high living standards and poverty rates that are among the lowest in Latin America. At the same time, the government has prioritised the protection and conservation of the environment, reversing much of the deforestation that occurred from the 1950s to the 1980s, and preserving Costa Rica's abundant biodiversity. The agricultural sector has benefited from these favourable conditions and continues to constitute an important part of the Costa Rican economy, particularly in terms of exports and employment.

Building on Costa Rica's outward-oriented growth strategy of the 1980s, the agricultural sector has transformed and developed a successful and dynamic export sector. Prior to the reforms of the mid-1980s, the traditional[1] agricultural export sector was penalised by policies that supported the domestic industrial sector. In opening the economy, Costa Rica sought to expand and diversify agricultural exports by promoting non-traditional products in which it had a comparative advantage. The result was the emergence of a dynamic, non-traditional agricultural export sector. Today, Costa Rica is the world's larger exporter of pineapples (world market share of 55% in 2015), but also remains a successful supplier of traditional products, such as bananas, coffee and sugar.

Nevertheless, economic performance across the agricultural sector is uneven, and a number of challenges remain. There have been limited spillovers from the successful non-traditional export sector – and, to a lesser extent, the traditional export sector – which is dominated by large farms, to the domestic market, mostly served by small and less competitive farms. This dualistic structure is contributing to rising inequality and persistent poverty in rural areas.

Furthermore, productivity growth has stagnated across the sector in recent years, with impacts on inclusive growth as well as international competitiveness. This is compounded by Costa Rica's current macroeconomic performance, particularly the growing fiscal deficit. Given the importance of agriculture for rural development, these challenges are pressing, demanding policy responses.

This chapter outlines the characteristics of the agricultural sector, and assesses the factors that enable and constrain future productivity growth and development. It sets out the broad context for the development of the sector (Section 1.2), including political stability; economic growth, openness to trade and foreign direct investment (FDI); social indicators; and the natural resource endowment, climate and environmental context for agriculture. The chapter then discusses the sector's importance in terms of its contribution to exports and employment (Section 1.3), before turning to structural change in the agro-food sector (Section 1.4), outlining key trends in agricultural land use and production patterns, including farm structures (Section 1.5), land concentration and ownership. Drivers

of production and productivity growth are also discussed (Section 1.6), along with the related issues of structural changes, and new opportunities and challenges brought about by agricultural trade flows (Section 1.7). Lastly, the chapter explores upstream and downstream sectors (Section 1.8), analysing the linkages between farmers and domestic and international markets. It concludes (Section 1.9) by summarising the key findings.

1.2. Context

The development of the agricultural sector in Costa Rica has been facilitated by a broad set of factors, including political stability, a rich natural resource endowment and fertile climate, a strong foundation of social services, and a generally high overall level of economic development and openness. Nevertheless, ongoing policy reform is required to address challenges in productivity growth and to ensure continued competitiveness, while maximising the sector's contribution to rural development, against a backdrop of continued fiscal and unemployment pressures following the global economic crisis.

Political characteristics

Costa Rica's tradition of **democracy** and political stability has played a key role in its economic success. With secure human and political rights, the country has developed into one of the most stable democracies in Latin America. Democracy also supported the structural and trade reforms of the mid-1980s – pushed forward by a wide consensus among Costa Rican policy makers on the adoption of an outward-oriented development strategy (Ferreira and Harrison, 2012). Political stability has also been a key factor in the country's success in attracting FDI.

As a presidential democracy with a Legislative Assembly, the central government **administration** is comprised of three branches – executive, legislative and judicial – and an electoral branch, the Supreme Tribunal of Elections. Control of the legislative agenda is shared between the Executive and the Legislative Assembly. Geographically, the country is divided into seven administrative divisions (or provinces) – Alajuela, Cartago, Guanacaste, Heredia, Limon, Puntarenas, and San Jose – and 81 cantons (local governments) (Figure 1.1.).

In 2006, Costa Rica shifted from a bi-partisan to a **multi-party system**, which has contributed to slowing reform processes in the last decade. Reform processes have become complex and lengthy, as rules designed for a two-party system still apply (IDB, 2011). The OECD (2016a) and the World Bank (2015) note that the increasing difficulties in obtaining timely approval for comprehensive reforms, particularly on sensitive issues such as fiscal reforms, pose a risk to continued economic growth.

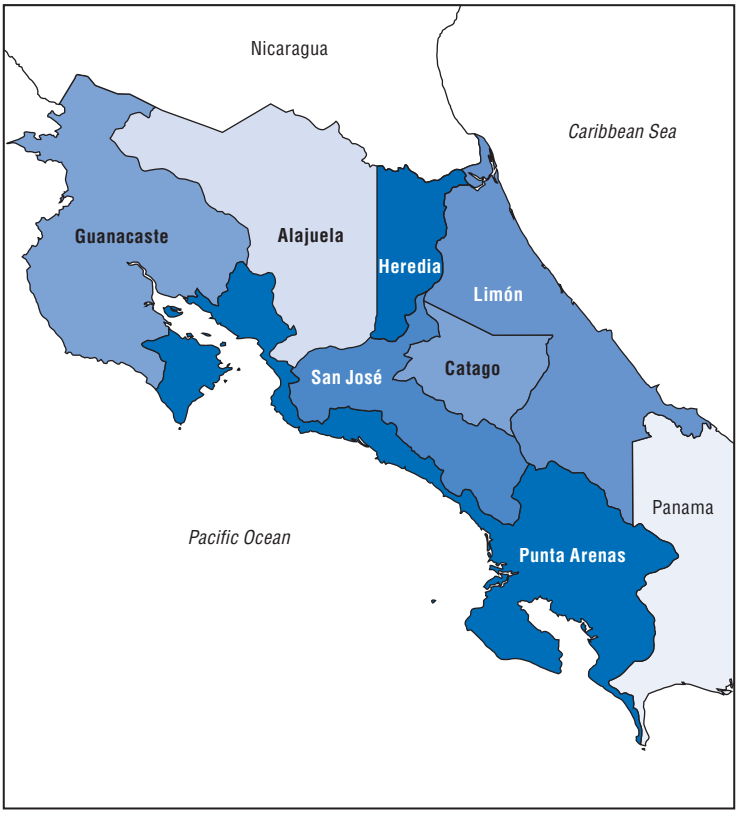
General features of the Costa Rican economy

Costa Rica is classified by the World Bank as an upper-middle-income country. Gross Domestic Product (GDP) was USD 51.1 billion in 2015 (current prices). Per capita income was USD 15 377 (in purchasing power parity [PPP] terms) in 2015, above the average for Latin America and the Caribbean, and more than double the figure from 1995 (OECD, 2016a). Costa Rica ranks 69 out of 188 countries in the United Nations' Human Development Index (HDI), placing it in the high human development category.

On average, **economic growth** has been positive, with real GDP growth measuring around 4.6% per annum over the last 25 years (Figure 1.2). In the 1990s, growth was high, reaching up to 9.2% (1992) and 8.4% (1998). In the early 2000s, there was a significant slowdown (1.1% in 2001), but growth rebounded from 2005 to 2007 (an average of 7.5% per annum).

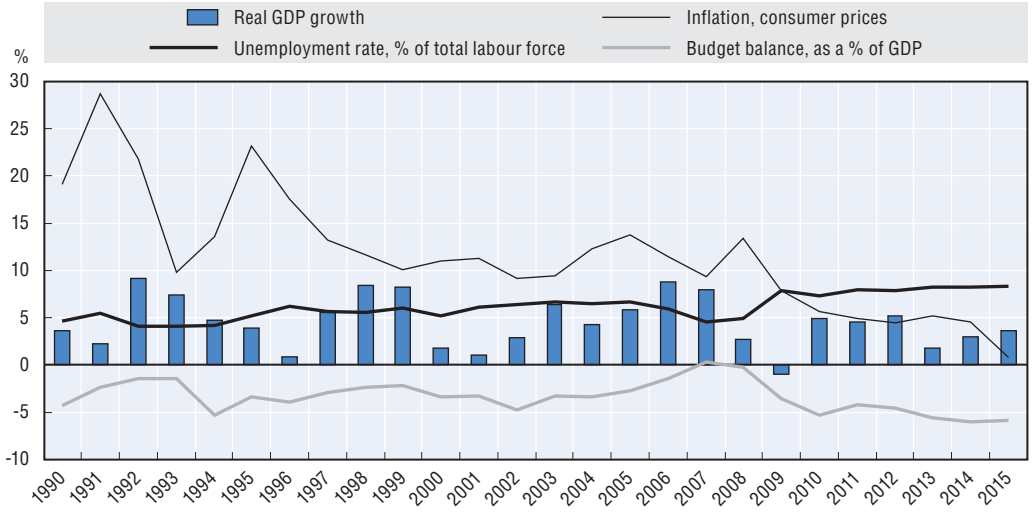
The global economic crisis hit Costa Rica hard, and the economy contracted (-1% growth) in 2009, as decreasing demand both globally and in the United States led to a decline in agricultural exports. However, the economy has recovered relatively quickly, growing at 3.6% per annum on average over the last five years.

Figure 1.1. **Map of Costa Rica (province level)**



Source: INEC (2016).

Figure 1.2. **Costa Rica: Selected macroeconomic indicators, 1990-2015**



Source: International Monetary Fund (IMF) (2016), *World Economic Outlook Database* (WEO) (2016).

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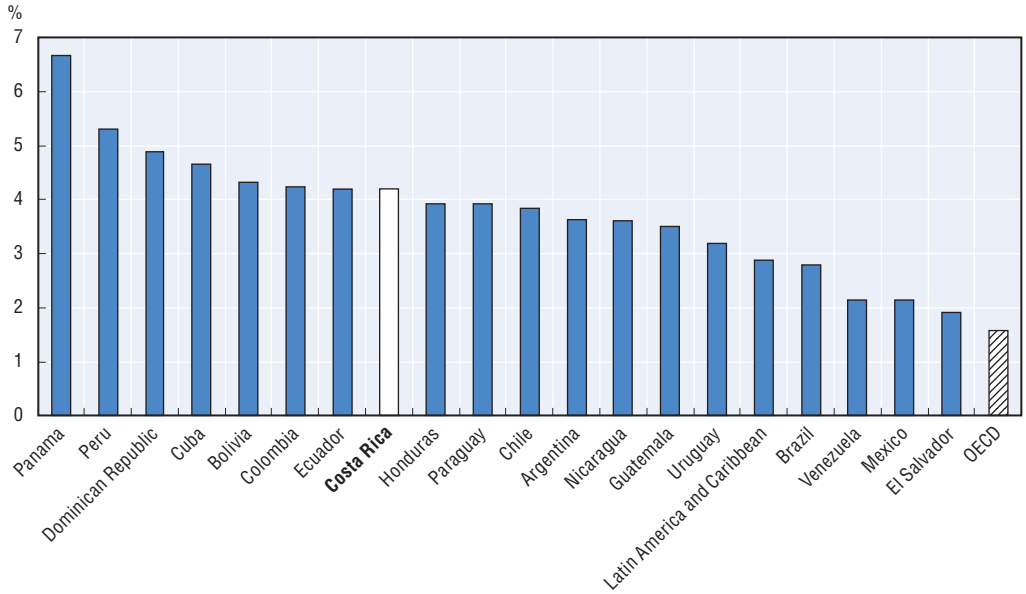
Compared both to other Latin American countries and the OECD average, Costa Rica's growth performance has been well above average (Figure 1.3). Between 2000 and 2015, Costa Rica's average economic growth rate of 4.2% was similar to that of Colombia and Ecuador, and larger than those of Brazil or Chile. Of all Central American states, only Panama displays higher growth rates.

Figure 1.3. **Average annual real GDP growth rates of selected Latin American countries, 2000-15**



Notes: 2000-15 average annual percentage growth rate of GDP at market prices, based on constant 2010 US dollars. Where 2015 data was not available, closest year was used.
Source: World Bank (2016), *World Development Indicators*.

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Inflation in Costa Rica has been on a declining trend since 1990. Notwithstanding some peaks in 1995, 2005 and 2008, inflation decreased from 19% in 1990 to 0.8% in 2015. Very low inflation in recent years is due to falling commodity prices, spare capacity in the economy, and exchange-rate appreciation (OECD, 2016a).

Fiscal space for new policies in Costa Rica – including in the agricultural sector – is limited. The budget balance has been negative, averaging around -5.2% in the last five years. In 2015, the central government's fiscal deficit reached around 6% of GDP. Increases in government spending (and the public-sector wage bill in particular) have been key contributors to the sharp increase in public debt, from 28% of GDP in 2009 to more than 40% in 2015. As a result, rating agencies have downgraded Costa Rica's debt to below-investment grade (OECD, 2016a).

Unemployment, low for many years, surged during the global economic crisis, and has not recovered since. From 1990 to 2008, unemployment averaged around 5%. However, in the wake of the crisis, the unemployment rate has remained around 8% since 2009. The creation of new jobs has neither been uniform nor sufficient to recover those lost during the crisis (PEN, 2012). Furthermore, structural unemployment has increased because of shifts away from labour-intensive activities to higher value-added activities in services and industrial exports, increasing the demand for higher-skilled labour but releasing low-skilled labour (OECD, 2016a). Unemployment has also been consistently higher in rural areas, with the exception of 2015 (INEC-ECE, 2016) (Section 1.3 provides more detail on employment in agriculture).

Costa Rica's economic growth has been fuelled in part by its **integration within global markets**. Costa Rica is active in the multilateral trading system, both as a GATT member since 1990 and a founding member of the WTO in 1995. Costa Rica currently has 14 free trade agreements (FTAs) in force with 49 trading partners, both individually and as a member of the Central American Common Market (CACM). These agreements include Costa Rica's largest trading partners (the United States, the European Union and the People's Republic of China – hereafter "China"), and cover almost 93% of exports and almost 83% of imports (COMEX, 2016c; OECD, 2015a). The most important regional agreement is the 2009 Free Trade Agreement between the Dominican Republic, Central America (El Salvador, Guatemala, Honduras, Nicaragua and Costa Rica) and the United States (CAFTA-DR). As a result of these agreements and Costa Rica's unilateral process of phasing-out and reducing tariffs, average tariffs have fallen by 39% over the last 15 years, while tariffs faced by Costa Rican exporters have fallen by 37.5% (OECD, 2015a) (for a more in-depth analysis, see Chapter 2).

Costa Rica's location in Central America and integration into regional and other trade agreements have enabled it to overcome the constraints of its small domestic market and benefit from its comparative advantage in exportable crops. While Costa Rica's domestic market is limited by its small population (4.77 million in 2014), it has access to export markets in North and South America, and direct ocean access to Europe and Asia. Proximity to the United States has been particularly important, both as Costa Rica's main export market and as a factor in attracting FDI. Moreover, as a member of the Central American Common Market, Costa Rica benefits from geographical proximity to – and the economic complementarity of – signatories to that agreement (Trejos, 2013).

FDI has also played an important role in Costa Rica's outward-oriented development. According to the *OECD FDI Regulatory Restrictiveness Index*[2], Costa Rica's FDI policy is slightly more open (with an index score of 0.05 in 2012) than the OECD average (0.07). This openness has encouraged FDI from the United States (accounting for around 60% of cumulative inflows between 2000 and 2012), as well as from Spain, Canada, Mexico and Colombia, among others (OECD, 2013). While FDI initially focused on the agro-industry, textiles and apparel sectors, it has since diversified towards more technology-intensive sectors and services. The opening of INTEL plant, for example, during mid 2000s was an important foreign investment in the country that had a signalling effect on other investments. Between 2000 and 2012, agriculture and agro-industry accounted for only 4% of cumulative inflows (OECD, 2013), although there are no limits on FDI in agriculture and forestry (OECD, 2014b). Although FDI has been fundamental to Costa Rica's growth strategy and economic success and continues to be important, it is challenged by skilled labour shortages (World Bank, 2015).

Due to its achievements in democratic stability, economic reform, trade openness, social indicators and the environment, Costa Rica is often ranked highly in international **competitiveness** rankings in comparison with other countries in the region; however, some major challenges remain. According to the *Global Competitiveness Index* (2015–16) (WEF, 2015), Costa Rica has increased its relative competitiveness in recent years. Costa Rica now ranks 52nd of 144 countries (compared to 56th in 2010-11), and is considered to be in transition from an efficiency-driven to an innovation-driven economy. Within Latin America, Costa Rica is a top performer, after Chile (35th) and Panama (50th). Costa Rica scores highly with respect to higher education, and institutions and innovation also rate well. However, the country scores poorly in other areas, such as market size, infrastructure, labour market efficiency and financial market development. An inefficient bureaucracy and inadequate infrastructure were cited as the two most problematic factors for doing business (WEF, 2015), and increase transaction costs along the

agricultural marketing and supply chains. Other factors affecting competitiveness are domestic cost pressures from high energy costs, high labour costs, a lack of skilled labour, high logistics costs (infrastructure), and the appreciation of the exchange rate (SEPSA, 2015; World Bank, 2015).

Demographic and social characteristics

Costa Rica's **population** of 4.8 million is ageing and increasingly concentrated in urban areas. Estimates suggest that Costa Rica will become an aged economy[3] in 2024, due to falling fertility rates in recent decades (OECD, 2016a; ECLAC, 2013). Urbanisation is also a rising trend: 76% of the population (3.6 million) lived in urban areas in 2014, a significant increase from 45% (1.2 million) in 1984 (World Bank, 2014). Much of the urban population is concentrated in the province of San José.

Costa Ricans have a generally high standard of **health** as a result of economic growth and sustained government commitment to the provision of basic public services. In 2015, the average life expectancy in Costa Rica was 80 years (INEC, 2016). Decades of investment have contributed to this outcome and also resulted in near universal access to healthcare, clean water and sanitation (BTI, 2014). Current public spending on health amounts to 10% of GDP (OECD, 2016a).

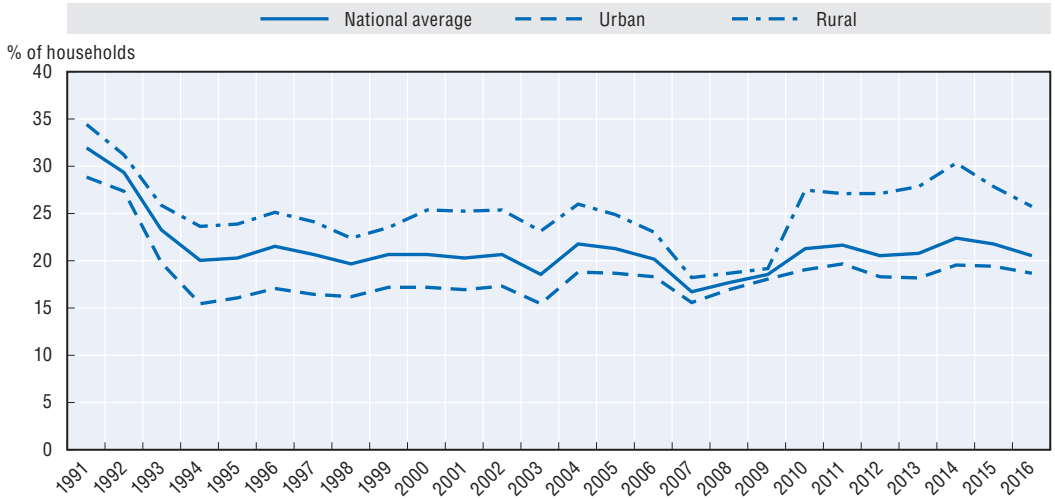
Costa Rica's commitment to universal **education** has ensured high literacy rates and nearly full enrolment in primary education. Public spending on education amounts to 6.9% of GDP (OECD, 2016a), and the country is considered to have one of the best higher-education and training systems in the Latin American region (WEF, 2015). Costa Rica's well-educated labour force remains an important factor in attracting FDI in technology and skill-intensive industries, although skills shortages remain (World Bank, 2015).

However, educational levels have declined recently, and the gap **relative to OECD and several other Latin American countries** is large. For instance, the average level of schooling in Costa Rica is lower than in Chile, Colombia, Venezuela and Panama (OECD, 2016a). Educational levels in rural areas are particularly low: around 80% of 18-year olds have not finished secondary school (Fernández and Del Valle, 2014).

Low levels of education are one of several factors that are perpetuating **poverty**. By international standards, poverty in Costa Rica is low. The poverty headcount ratio at USD 1.90 a day (2011 Purchasing Power Parity [PPP]) has been less than 2% since 2010 and, at USD 3.10 a day (2011 PPP), has not exceeded 4% since 2010 (WDI, 2016). That said, while Costa Rica's poverty rate is lower than in most Latin American countries, the percentage of households living under the national poverty line has not improved over the last 20 years (Figure 1.4). Following a sharp decline in the early 1990s, the poverty rate measured by the national poverty line averaged around 20% of all households between 1994 and 2006. Although the poverty rate decreased to 17% in 2007, it returned to 22% in 2010. While the increase in poverty can be largely explained by a change in the methodology for calculating poverty rates in 2010[4], the legacy of the global economic crisis was also a factor. Rural poverty rates continue to be above the national average.

At the regional level within Costa Rica, poverty is most prevalent in the northwest and southeast (Figure 1.5), regions in which a large share (50-71%) of the population is employed in agriculture (INEC, 2013). The North, Northern Guanacaste and Northwest Alajuela regions, which border Nicaragua, have the largest percentage of households living below the national poverty line (more than 45%). In other cantons in Northern Alajuela, between 33% and 44% of households are living below the national poverty line. In the South, cantons close to Panama also have high poverty levels, such as Talamaca (Limón) (more than 45%) and Buenos Aires and Coto Brus (Puntarenas) (between 33% and 44%). The central region has the lowest share, with less than 12% of households living in poverty in certain cantons.

Figure 1.4. **Percentage of households living under the national poverty line, 1991-2016**



Notes: The definition of poverty includes all households that are unable to meet their basic needs (non-food consumption basket), using the Orshansky coefficient (INEC, 2015a, 2010a). Values from 2010 onwards are not directly comparable with previous years, due to changes in the sample and in the questionnaire, and methodological adjustments in measuring poverty.
Source: INEC (from the Multipurpose Household Survey [EHPM]) until 2009, and the National Household Survey (ENAHO) from 2010 onwards.

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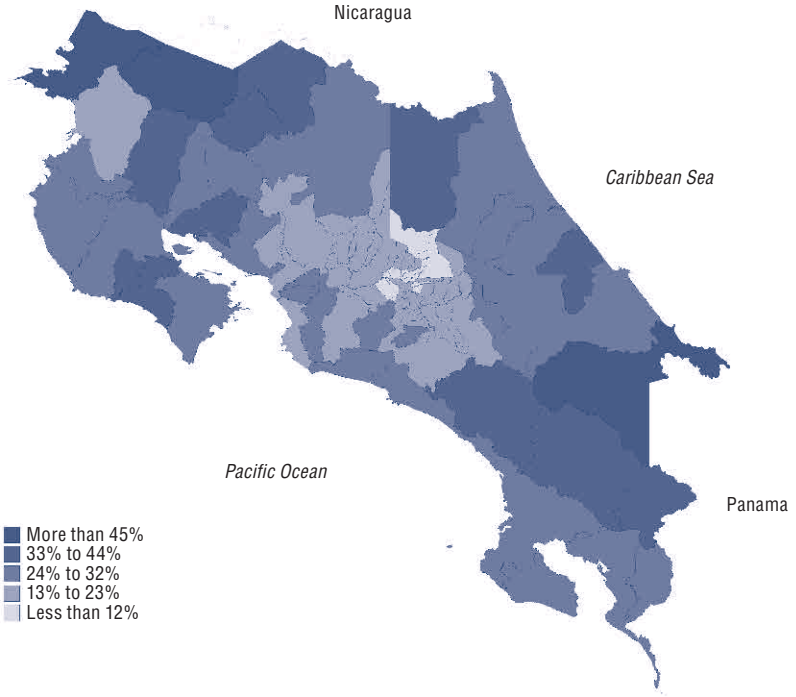
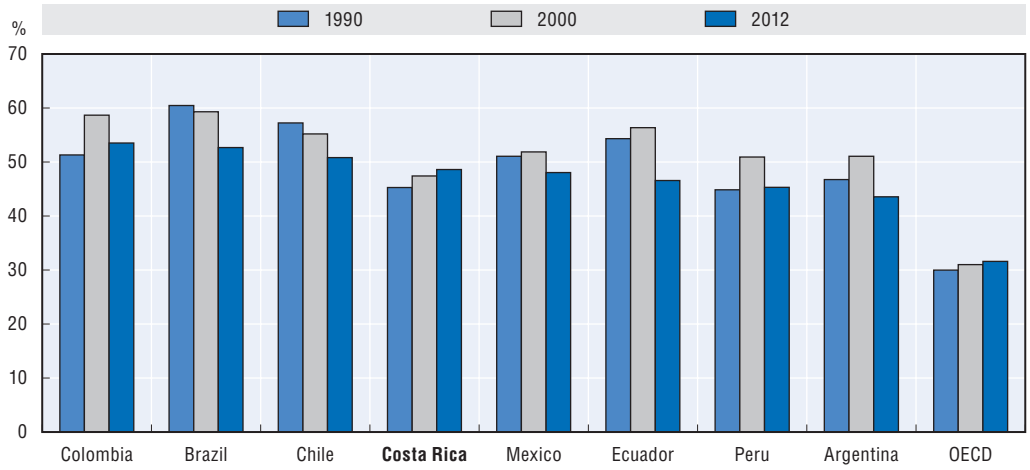
Figure 1.5. **Poverty map: Percentage of households living under the national poverty line (2011)**



Note: At canton level.
Source: INEC (2016).

Although **inequality**, as measured by the Gini coefficient (48.6% in 2012), is lower than in most Latin American countries, it is high by OECD standards (31.6% in 2012). Moreover, inequality increased between 1990 and 2012, and now exceeds levels in Ecuador, Peru or Argentina (Figure 1.6).

Figure 1.6. **Inequality in Costa Rica and selected Latin American countries**



Note: Based on GINI coefficient (World Bank estimate).
Source: World Bank (2016), *World Development Indicators*.

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Natural resource endowment and climate

Located between Nicaragua and Panama, Costa Rica is a **small Central American country** that borders the Caribbean Sea and the North Pacific Ocean. Coastal areas (the Pacific and Caribbean regions) are separated by mountain ranges that run from the northwest to the southwest and by many plateaus in the north and northwest of the country.

Land is scarce in Costa Rica. The country's total land area is 51 100 km^2, including 40 km^2 of surface water and over 26 500 km^2 of forest cover[5] (World Bank, 2015). Competition for land resources has increased in recent decades, with pressure to convert farmland to non-agricultural uses, such as tourism, residential areas and reforestation. As a result of governmental programmes, for instance, forest cover increased from 21% of land in the late 1980s, to over 50% in 2013 (World Bank, 2015). Around 25% of the country is under some category of protection (INBio, 2016), a contributing factor to its successful development of ecotourism. The total agricultural area – including pastures – is currently 1 589 257 ha, or around 31% of total land area (47% when forest area on farm land is included).

Costa Rica is a **water**-abundant country; however, water scarcity is a growing challenge in certain agricultural regions. The total amount of water available is estimated at almost 112 million cubic meters per year; discounting losses for evaporation, infiltration and other processes, net available water is 75 million cubic meters per year (Pomareda, 2015). More than 90% of water concessions (by volume) are granted to the agro-food sector as a whole: 85% to agriculture and 6% to agroindustry (DNA, 2013). Costa Rica's topography and abundant rainfall have permitted construction of hydroelectric power plants, generating 66% of the country's energy. At the same time, water scarcity is a concern in some regions – the Northern Pacific in particular. Overuse exacerbates these concerns: according to a MINAE study on the hydrological balance in 15 of the country's 34 watersheds, inefficient water use is a significant challenge (Pomareda, 2015).

Costa Rica's diverse **climate** has fuelled its success in the export of a wide range of commodities. The climate is generally mild in the central highlands, arid in the northwest, and tropical and subtropical in the coastal areas, with different spatial and temporal precipitation patterns. Much of the land available for farming is topographically rugged and unsuitable for the mechanised production of grains and commodity bulk crops. Nevertheless, the land is highly fertile as a result of volcanic soils, high biomass and altitude, and abundant rainfall (Trejos, 2010).

Costa Rica is, however, one of the most exposed countries to **natural hazards**. According to the World Risk Index (ADI, 2014), Costa Rica has the seventh-highest risk of disasters worldwide. Droughts and floods due to *El Niño* and *La Niña*[6] are of particular concern, triggering national emergency declarations on a frequent basis. Climate change is expected to worsen these conditions (Chapter 3).

High levels of **biodiversity** have also contributed to the agricultural sector's success. Despite its small land area, Costa Rica represents 3.6% of the world's biodiversity (Box 1.1). Biodiversity has also contributed to the successful development of the eco-tourism sector.

Box 1.1. **Biodiversity**

Costa Rica is world-renowned for its rich biodiversity. While representing only 0.03% of the world's land surface, Costa Rica hosts 3.6% of the world's estimated biodiversity (between 13 and 14 million species). In 2005, there were around 94 753 registered species, or about 5% of all known species in the world, placing it among the 20 countries with the highest rate of biodiversity (Obando, Herrera, and Ugalde, 2013).

Due to its contribution to genetic variety and ecosystems, biodiversity is important for agriculture and the environment in Costa Rica. For example, numerous wild varieties of potatoes grow in the country, and can be used as genetic resources to create better varieties with greater resilience to climate change. Furthermore, biodiversity plays an important role in developing ecotourism. Nature and biodiversity are the main attractions in this sector, which contributed around 5% to Costa Rican GDP (approximately USD 1 357 million) in 2009 (Moreno et al., 2010).

However, biodiversity is threatened by waste, water and air pollution, resource exploitation, illegal hunting, and urbanisation. Intensive agriculture is one of the most important factors in terms of increased pressure on biodiversity. Intensified agricultural activity through the expansion of pineapple, sugar cane and palm oil production has encroached on protected river zones and led to numerous violations of the Forest law (Programma del Estado de la Nación (PEN), 2012). In response, the government has taken measures to increase biodiversity protection, including initiation of the National Biodiversity Strategy (*Estrategia Nacional de Conservación y Uso Sostenible de la Biodiversidad*) under the National Biodiversity Programme framework (INBio, 2016).

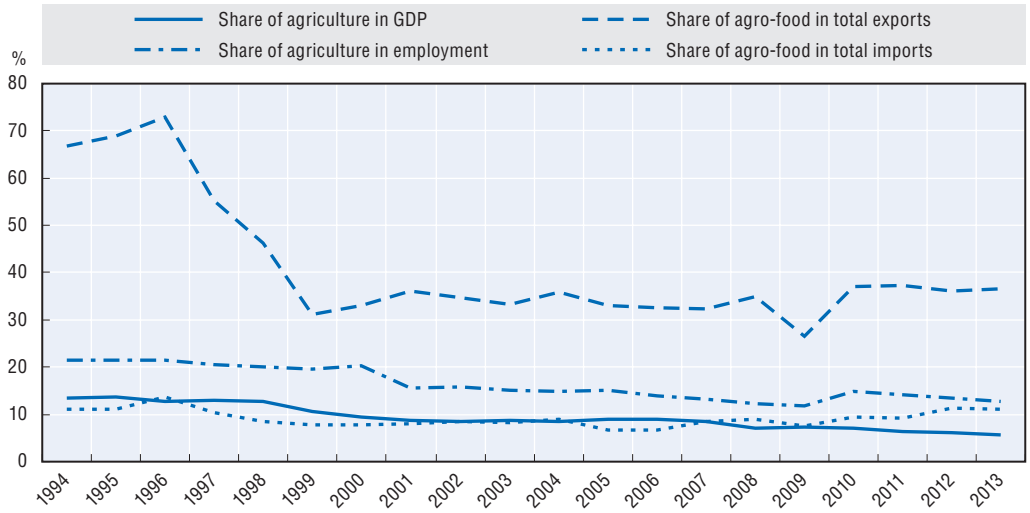
Source: SINAC (2014); INBio (2016); Pomareda (2015); Politica Nacional de Biodiversidad (2015).

1.3. The role of agriculture in the Costa Rican economy

In recent decades, as a growing services sector has altered the structure of the Costa Rican economy, **agriculture's share in GDP** has declined (Figure 1.7). Agriculture's contribution (crops and livestock) to GDP declined from 13.7% in 1994 to 5.6% in 2013. The share of industry also decreased from 29.6% to 25% over this period. Meanwhile, the share of services increased from 57% of GDP in 1994 to 69.4% in 2013. Nevertheless, the absolute value of all three sectors has increased in real terms, despite their falling share in GDP.

While the agricultural sector's contribution to GDP has been relatively low over the last 20 years (Figure 1.7), it nonetheless plays an important role in the Costa Rican economy, due to its contribution to **export earnings** (Section 1.7). Until the mid-1990s, the share of agricultural exports in GDP was higher than manufacturing exports, and increasing. This share declined sharply in the late 1990s, due to growing exports from firms located in Costa Rica's free trade zones (FTZs), in high technology exports – including electronics, medical devices, automotive, aerospace/aeronautics and film/broadcasting devices – and in services (business outsourcing) (OECD, 2016a). That said, agricultural exports have remained between 31.1% and 37.2% of total exports since 1999, aside from a dip in 2009 due to the global economic crisis.

Figure 1.7. **Agriculture's contribution to the economy**



Note: Agro-food trade data include fish and fish products.
Source: World Bank (2016), *World Development Indicators*; *UN COMTRADE Database* (2016).
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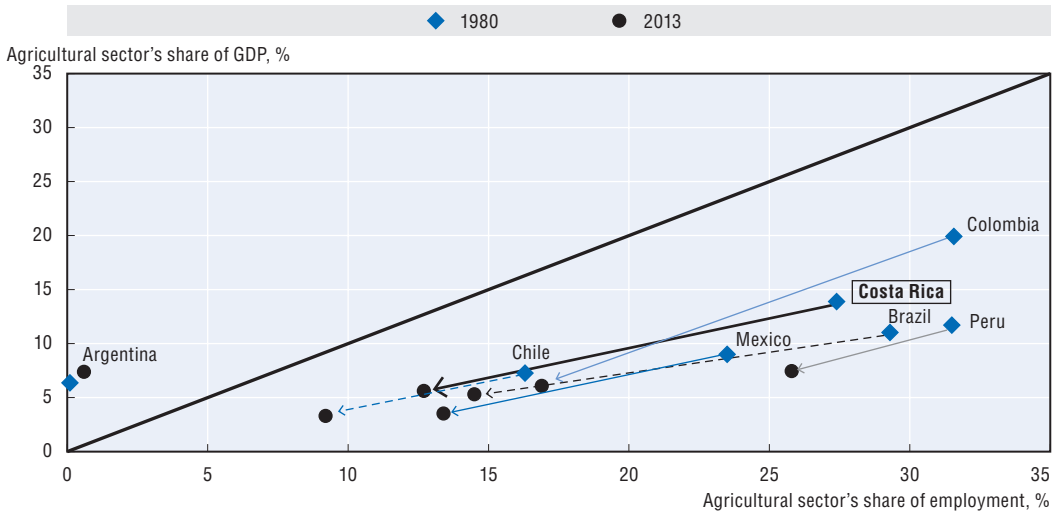
The agricultural sector's contribution to **employment** is also noteworthy. At 12.7% of employment in 2013 (WDI, 2016), the agricultural sector was the second-largest source of employment in the economy – exceeded only by services (INEC – Encuesta Contínua de Empleo (ECE), 2016). Moreover, agriculture is the largest employer in rural areas, accounting for 31.7% of rural employment in 2013. It is also a major source of employment in several regions: Chorotega (20.1%) and Huetar Norte (34.9%) in the north, and Brunca (32.3%) in the south and Huetar Atlantica (35.6%) in the east (INEC-ENH, 2016).

Overall, however, the share of agriculture in total employment has fallen significantly in recent decades, a common trend during **structural transformation of the economy**. The share of agriculture in total employment has fallen by more than half, from 27.4% in 1980 to 12.7% in 2013.[7] Over the same period, agriculture's contribution to Costa Rican GDP also declined, from 13.9% to 5.6% (Figure 1.8). Although other countries in the region have experienced similar declines, Costa Rica's transformation has been faster than for some major Latin American countries, such as Brazil or Mexico.

Today, traditional agricultural products for export and the domestic market are the **main sources of employment** in the sector, underscoring the importance of agriculture for rural development. In 2014, the shares of total employment in traditional products

for export and the domestic market were 38.1% and 46%, respectively. In the same year, non-traditional agricultural exports generated 15.4% of agricultural employment (INEC, ENH, 2014). Nevertheless, despite the importance of traditional agriculture as a source of employment, it has struggled to generate *higher-skilled* jobs, an important path for rural development. Agricultural production for the domestic market, in particular, is less dynamic, and employs mostly unskilled labour – workers with low levels of education and thus a lower capacity to move to other sectors. Low skill levels also potentially constrain structural changes that would otherwise lead to higher-value production (INEC, 2014).

Figure 1.8. **Evolution of agriculture's share of GDP and employment in selected countries, 1980-2013**



Note: 2013 or latest available year. Where 1980 data was not available, closest year was used.
Source: World Bank (2016), *World Development Indicators*; National data (2015), SEPSA (2016).

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In some sub-sectors, agricultural **employment is variable** and vulnerable to contractions in production and exports. For example, the outbreak of rust in coffee plantations in 2013, which resulted in a nearly 30% decrease in exports, had a significant impact on agricultural employment. According to the International Coffee Organization (ICO), almost 14 000 workers were affected (PEN, 2014). Such variability is particularly serious when sub-sectors are regionally concentrated (as is the case for bananas and coffee), as it can have significant regional and local impacts on employment.

Informality is also high in agriculture, contributing to vulnerability and higher poverty in the sector (OECD, 2016a). Informal employment has been increasing and accounted for 45% of total employment in 2014 (OECD, 2016a; OECD, 2016b). Informal labour in the agricultural sector is even higher, at 60% of all agricultural employment in 2014 (INEC-ECE, 2016). Important informal labour comes from Nicaragua, the largest immigrant group in Costa Rica (75% of all immigrants). That said, in 2015, around 12% of the *formal* agricultural labour force also came from Nicaragua (INEC, 2016), most of whom (62%) work in the plantations of permanent crops[8] (INEC-ECE, 2016). PEN (2015a) and OECD have argued that high social services contributions are a factor driving informality in agriculture, and are also potentially constraining employment growth, including in agriculture (e.g. as farms and rural small or micro-enterprises seek to expand).

1.4. Structural change in the agro-food sector

Due to favourable underlying conditions and reforms, the Costa Rican agricultural sector has grown and diversified in the last decades; however, growth has been unequal across the sector. The agricultural sector in Costa Rica is characterised by a **dualistic structure**, with a successful and dynamic export sector and a more traditional, less competitive, domestic agriculture, characterised by small-scale farms.[9] The export sector has typically focused on products such as bananas, coffee and sugar; more recently, production has expanded to include non-traditional exports, such as pineapple and palm oil. Meanwhile, the domestic sector focuses on grains, fruits and vegetables.

Prior to the reforms of the mid-1980s, Costa Rican agriculture was already characterised by two distinct sectors: one composed of large-scale industries producing traditional products almost exclusively for export (including bananas on plantations managed by transnational companies), and the other producing for the domestic market. Export taxes were applied to agricultural commodities in which Costa Rica had a strong comparative advantage (bananas and coffee) (Cattaneo, Hinojosa-Ojeda, and Robinson, 1999). At the same time, the food and basic grains industry for the domestic market did not receive support in the form of productive development policies nor the foreign investment necessary for development.

The dualistic structure was reinforced by the **trade liberalisation reforms** of the 1980s, which enabled the emergence of several new export crops. In the mid-1980s, agricultural policy reflected the broader government objective of trade opening, and policies sought to foster skills and private initiatives that would promote exports of new products in which Costa Rica had a comparative advantage and thus enable the economy to take advantage of greater openness to trade. Tariffs were reduced dramatically, quotas were eliminated, government controls over land use and crop allocations were removed, and, in many cases, support to agriculture ceased to be linked to import-substituting crops (Trejos, 2010). Other agricultural reforms included the improvement of markets for agricultural inputs, credit and products, and the closure of some government-administered agribusinesses (Trejos, 2013a) (reforms in the sector are covered in more detail in Chapter 2).

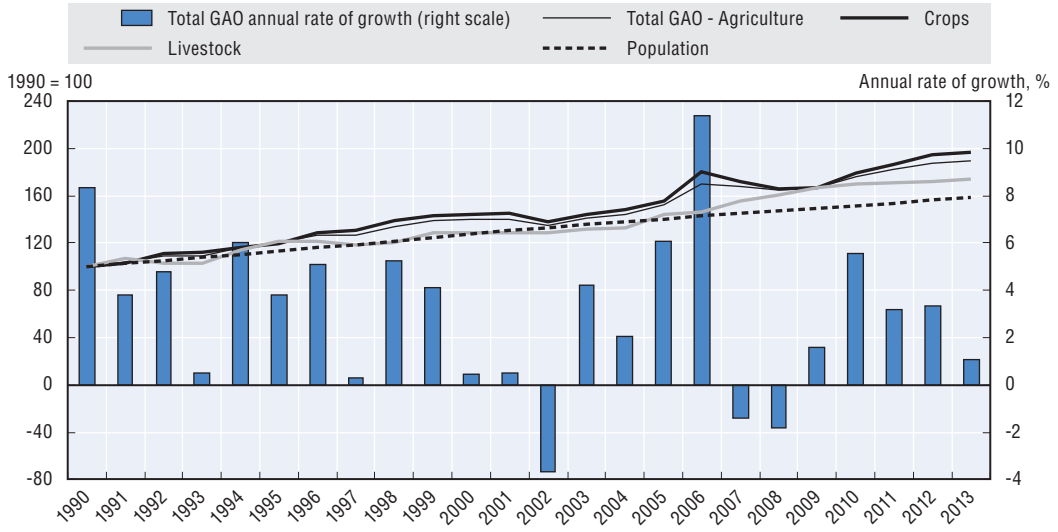
Production trends

Following trade opening, **agricultural output** increased (Figure 1.9), predominantly due to impressive growth in the production of non-traditional exports as well as less land-intensive livestock products (Figure 1.10). Pineapples increased their share in total agricultural value at the expense of bananas and coffee in particular, from 9% in 1995-97 to 24% in 2013-15. The share of livestock products (beef, pig meat, poultry and milk) increased from 17% to 27% over the same period. Milk production increased its share of total value from 4% to 11% and surpassed beef, which fell from 6% to 5%.

The impressive growth of **non-traditional export crops** and the stagnation of growth in **traditional crops** can also be seen in absolute terms (Figure 1.11). Pineapple production more than quintupled in the last 20 years (from 424 480 tonnes in 1995 to 2 758 593 tonnes in 2015), notwithstanding setbacks in 2013 and 2014, due to severe flooding (Gonzales, 2014). Palm oil production almost doubled from 490 000 tonnes in 1995 to 816 000 tonnes in 2015, in spite of a disease outbreak in 2014, known as "Flecha Seca". Traditional export crops (coffee and banana), by contrast, have remained close to their initial production levels. After a brief increase (up to 2004), coffee production fell below 1995 levels, due to the declining productivity of ageing plantations, increasing competition from other countries, and the outbreak of rust in 2013 (PEN, 2016; MAG-MIDEPLAN, 2016). Of the traditional crops, sugar cane production increased over the same period, from 3 233 000 tonnes in 1995 to 4 260 000 tonnes

in 2015. Paddy rice also increased from 165 866 tonnes in 1995 to 195 319 tonnes in 2015. Following the food price crisis, rice production experienced noteworthy growth over 2008 to 2011 as a result of agricultural policies aimed at promoting grain production through greater provision of services to rice producers, and minor subsidies. Rice production also increased as a consequence of high international prices that, when transmitted to domestic prices, motivated farmers to produce more rice (SEPSA, 2016).

Figure 1.9. **Growth in Costa Rica's agricultural output, 1990-2013**



Notes: FAO indices based on the 2004-06 period have been recalculated taking indices for 1990 as 100. GAO = Gross Agricultural Output. Years with negative growth, such as 2007-08, were characterised by adverse climatic conditions and diseases.

Source: FAOSTAT (2016), World Bank (2016), *World Development Indicators*.

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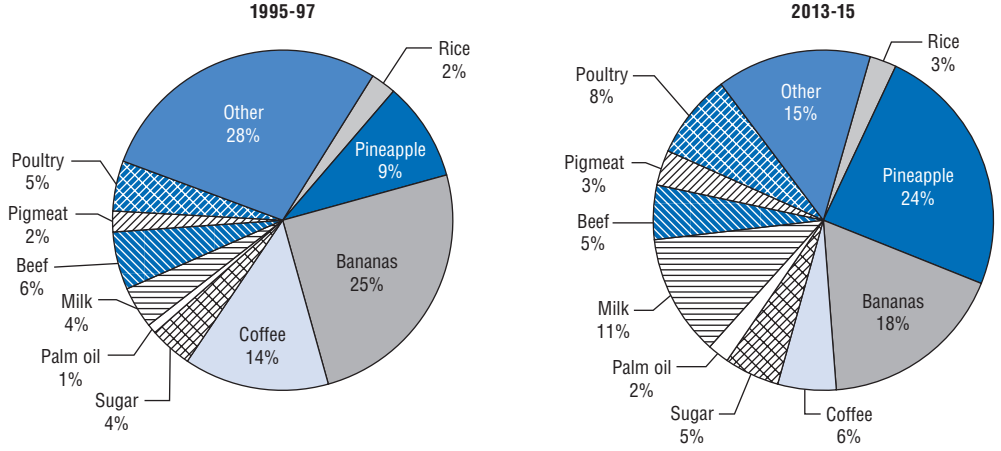
Figure 1.10. **Evolution of the structure of Costa Rica's agricultural sector, 1995-2015, value**



Note: The value of agricultural production by commodity is a result of the multiplication of volumes produced and domestic farm gate current prices.

Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

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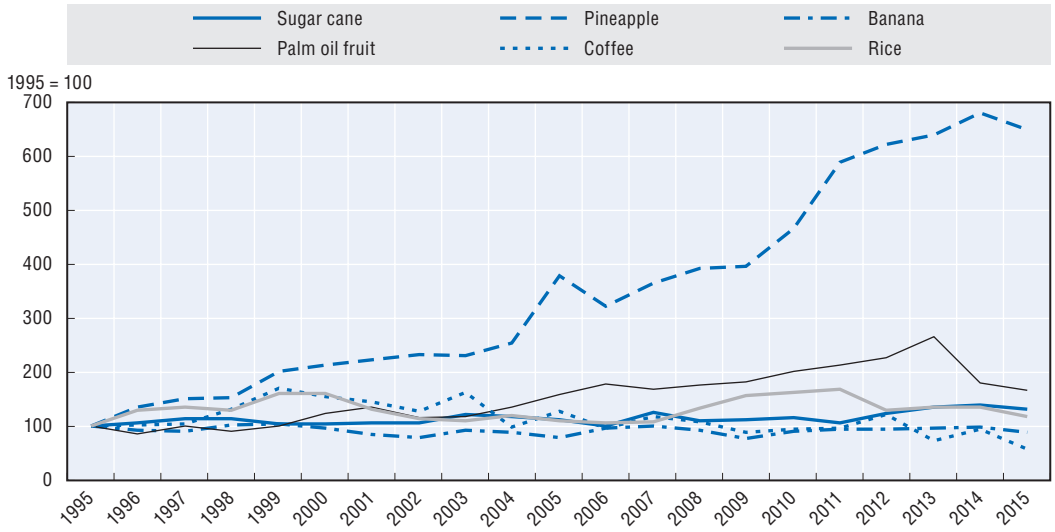
All **livestock** products, with the exception of beef, have seen a significant increase in production (Figure 1.12). The most noteworthy increase has been for pig meat, followed by egg and then poultry production. Dairy production has also increased: from 1995 to 2015, it grew

by 105%, due to the conversion of stock from beef to milk production and to double-purpose systems (milk and meat). Beef production, by contrast, has experienced *negative* growth in certain years, due to the conversion of agricultural area to forest or to export products – such as pineapple or dairy – as well as unfavourable conditions for fodder production, due to droughts in the Guanacaste area (CORFOGA, 2000). Although beef continues to dominate (42% of the national herd in 2014), the shares of combined milk and beef production (32%) and milk production (26%) in total livestock production have gained in importance since 2000 (CORFOGA, 2015).

Figure 1.11. **Growth in crop production, 1995-2015 (index)**



Note: This Index is derived from the total national production of the crops selected.
Source: SEPSA (2016).

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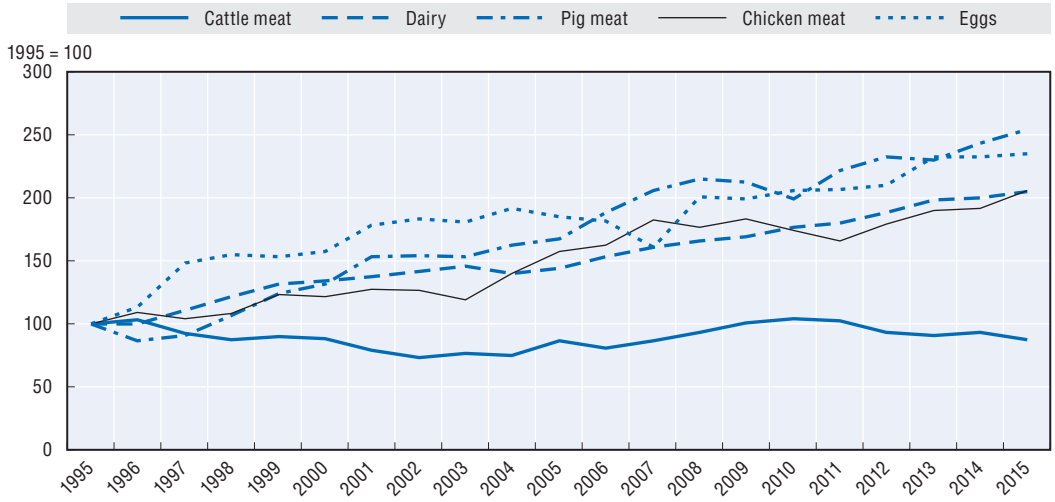
Figure 1.12. **Growth in livestock production, 1995-2015**



Note: This Index is derived from the total national production of the livestock products selected.
Source: SEPSA (2016).

StatLink http://dx.doi.org/10.1787/888933451545

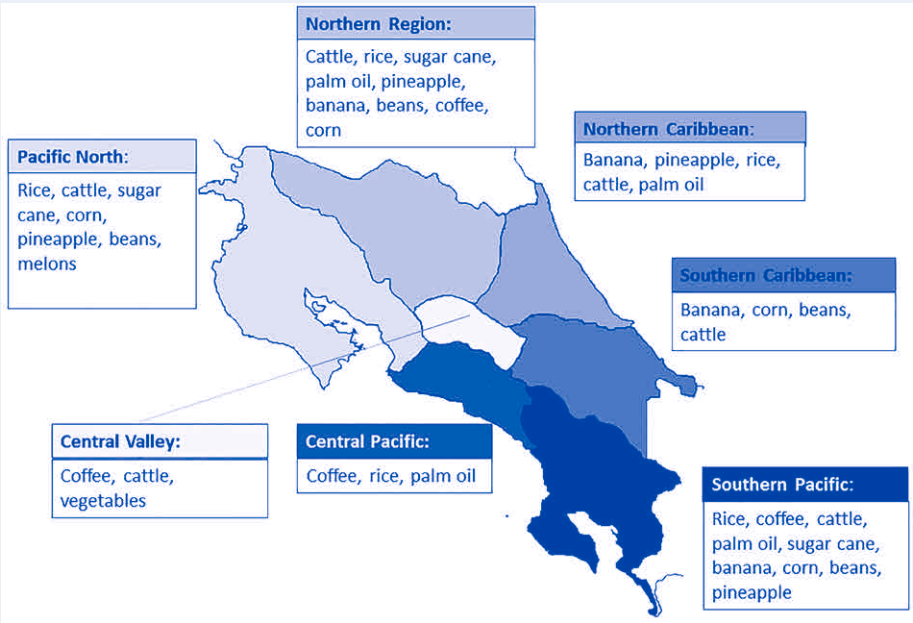
Consistent with the variations in climate and topography across Costa Rica, agricultural production varies across regions (Box 1.2). Certain products are highly concentrated in particular areas: for instance, as of 2014, around 80% of the total banana cultivation area is located in the province of Limón in the Southern Caribbean region, and pineapple production is also mainly located in this province.

Box 1.2. **Agricultural production by region**

Each region is characterised by different agricultural activities (Figure 1.13):

- Production in the **Northern** region includes export crops (pineapple, citrus, and ornamental plants) and cattle. Pineapple production is dominant. Farms in this area tend to be dual-purpose and dairy cattle farms. The area is also important for rice. The Northern region, together with the Pacific North, comprise more than 50% of total farm area.
- The **Pacific North** (Guanacaste province) is characterised by extensive cattle production. The beef industry, for example, is located primarily in this area. Rice production is extensive, with 28% of all rice production located in Guanacaste. Other important crops include pineapple, sugar cane and maize.
- The **Central Pacific** region is dominated by palm oil plantations, with some areas of rice production. Some coffee cultivation can also be found inland.
- Coffee and vegetable production is concentrated in the **Central Valley** region. 41% of coffee production is located in San José. Around 92% of the total coffee cultivation area is located in the central provinces of San José and Cartago, together with Alajuela and Puntarenas in the Northern and South Pacific Regions. Vegetables cultivated in the Central Valley include onions, potatoes, tomatoes and carrots. More than half of all farms with vegetable production are located in Cartago.
- The **South Pacific** region has extensive areas of mechanised pineapple and oil palm cultivation, as well as coffee and sugar cane. Palm oil production is predominantly located in the southern coastal regions, whereas pineapple production is located in the central part of this region.
- Export crops (such as bananas and pineapples) dominate production in the **Northern** and **Southern Caribbean** regions, although basic grains are also grown in the **Southern Caribbean** region. As of 2014, around 80% of the total banana cultivation area is located in the Limón province, in the Southern Caribbean region. Pineapple production in this region is also mainly located in Limón.

Figure 1.13. **Main agricultural activities across climate regions**



Note: Map received from IMN and edited by authors, INEC (2014).
Source: INEC (2015b), INEC (2014).

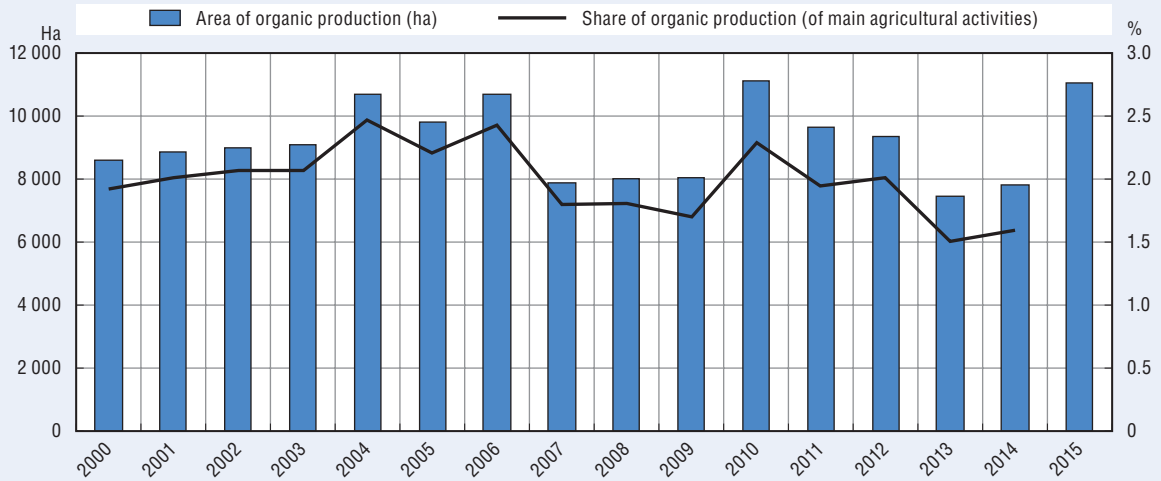
Costa Rica's long-term commitment to sustainable development has also led to interest in the development of **organic production**. While Costa Rica has been an early mover in this field (the first law pertaining to organic production was passed in 1995), organic production remains marginal, at around 1.6% of total production in 2014 (Box 1.3).

Box 1.3. **Organic production in Costa Rica**

Organic production in Costa Rica emerged in the early 1980s, starting with the organisation of co-operatives of small-scale vegetable farmers. In the late 1990s, several important organisations were founded to promote organic production, including the National Association of Organic Agriculture (ANAO) and the National Programme of Organic Agriculture (PNAO). The first law on organic agriculture was passed in 1995.[1] More recent laws include the Phytosanitary Protection Law in 1997 and the Law on Encouragement of Organic Agriculture in 2007 (Law No. 8591). In general terms, the agricultural policies that promote the organic agriculture include financial and tax incentives; free inspections, certifications and training; articulation of public-private efforts to facilitate research, credit and training for producers; and consumption promotion of organic products (MAG, 2016).

Despite these policies, the amount of certified area has not significantly increased (Figure 1.14). Currently, organic farming accounts for 1.6% of total production[2] in Costa Rica. In total, the country's share of organic production area is below the world average, and lower than in many other countries in the region (such as Argentina, Peru, Honduras, Panama, Nicaragua, Mexico and El Salvador) (FAOSTAT, 2016).

Figure 1.14. **Organic production area in Costa Rica**



Source: PEN, Environmental database (2016); SFE (2015).

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Various reasons have been given for the limited development of the organic sector, including cultural obstacles and prejudices (Barquero, 2010) or the global economic crisis and fluctuating prices for organic products (Amador and Cussianovich, 2002). A study on organic agriculture in Costa Rica for the National Programme for Organic Agriculture (IBS Soluciones Verdes, 2013) attributes the decline to a lack of resources, and of public and private support particularly in areas such as extension services, technical assistance and innovation systems (PEN, 2015a). Other identified barriers have been the high cost of certification, stringent requirements on traceability, low levels of mechanisation and limited production techniques, high cost of labour and organic fertiliser (MAG, 2016).

Box 1.3. **Organic production in Costa Rica** *(cont.)*

Another set of problems have been identified within the marketing and commercialisation channels. Despite support from various international organisations, farmers encounter difficulties in receiving price premiums for their organic products (PEN, 2015a). Although the majority of organic production (69%) is oriented towards exports, there is no national strategy to simplify access to international markets for small-scale farmers. According to the study by IBS Soluciones Verdes (2013), 38% of organic farmers face problems finding support to market and distribute their products. While 2015 saw another increase in organic production, these obstacles will need to be addressed if this trend is to be sustained.

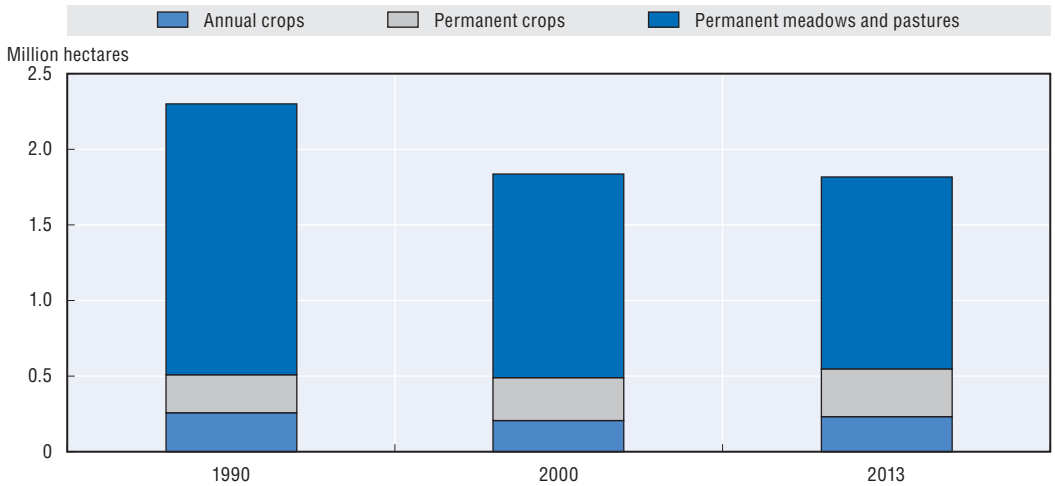
1. Ley Orgánica del Ambiente 7554.
2. Cultivated area of main agricultural activities (permanent and annual crops).

Land use

Structural change in production has been accompanied by **shifts in land use**. In particular, total agricultural area – including pasture, permanent crops, and annual crops – has decreased, from 2 305 000 ha in 1990 to 1 817 000 ha in 2013 (Figure 1.15). This reduction is largely attributable to the decrease in permanent meadows and pasture: in 1990, 77.9% of total agricultural land was dedicated to permanent meadows and pasture, but this share decreased to 69.8% in 2013. While most former pasture area was afforested (PEN, 2015b) (Box 1.4), some pasture and land for annual crops was reallocated to permanent crops, the area for which increased from 10.8% of total agricultural land in 1990 to 17.4% in 2013.

The shift toward land use for permanent crops reflects the increase in land dedicated to new export products, in particular the growth in pineapple and palm oil, as well as to sugar cane production. Between 1990 and 2013, the area dedicated to pineapple grew seven fold. A similar trend can be observed for palm production, for which the area more than tripled, and sugar cane, which doubled in area. Although the area dedicated to coffee decreased by 18.5%, it still constitutes the largest production area, accounting for 93 774 ha in 2013 (SEPSA, 2015).

Figure 1.15. **Agricultural land use in Costa Rica**



Note: Permanent crops includes crops that are not destroyed when harvested, but are able to produce again, such as coffee, sugar cane, palm, pineapple and bananas.
Source: FAOSTAT (2016).

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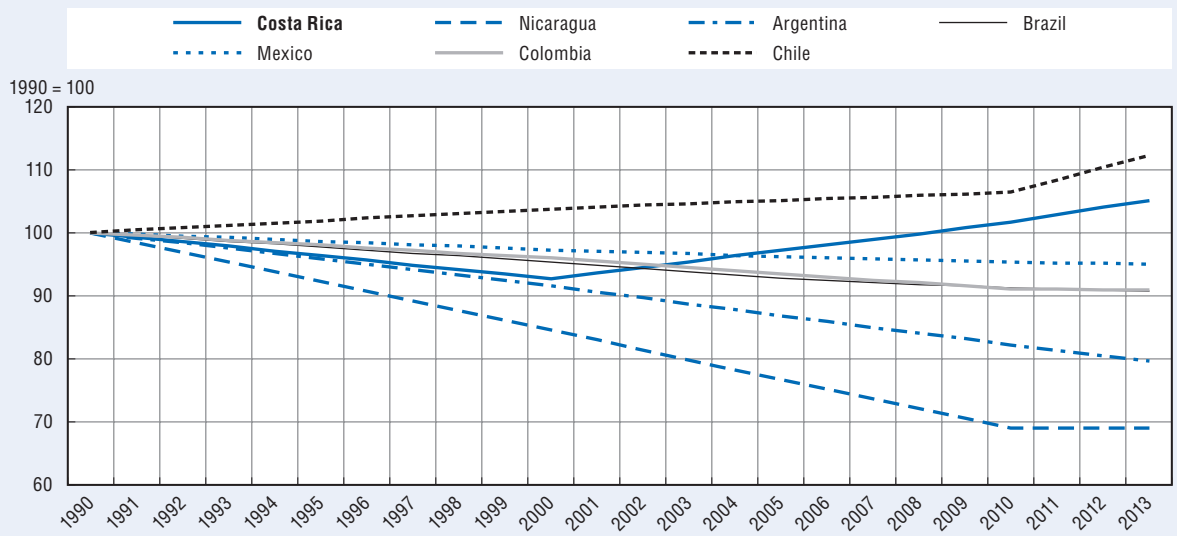
Box 1.4. **Forestry**

Between 1800 and the 1960s, around 40% of Costa Rican territory was deforested, a trend accelerated by the expansion of farming and population growth. The largest periods of deforestation occurred between 1960 and 1979, with around 35 000 ha lost per year, and between 1979 and 1986, with around 39 000 ha lost per year. In the 1980s, at the peak of deforestation, only 41% of Costa Rican territory was under forest cover. In an initial, sustained effort, from 1986 to 2000, however, 17 000 ha were recovered per year, increasing to 26 000 ha from 1986 to 2000 (PEN, 2009).

Indeed, in contrast to other Central American countries and global trends, Costa Rica's forest recovery efforts have been significant. Forest cover increased from 42% in 1997 to 53% of total land surface by 2013 (SINAC, 2015). Compared with other Central and South American countries, Costa Rica is the only country that has fully recovered its 1990-levels of forest cover – with the exception of Chile, which had a lower initial rate of forest cover (23%) (Figure 1.16).

Forest and conservation programmes have played a critical role in the reforestation process. In particular, the FONAFIFO programme, created by the Forest Law 7575 in 1996, offers financial incentives for owners of natural forests – around 600 000 ha are currently under the environmental services payment system (SINAC, 2014; Chapter 3). Reforestation is also encouraged by training and information programmes operated by MINAE and several NGOs. Furthermore, MAG assists producers in forest conservation practices, and provides technical assistance for the management of silvopastoral systems. Lastly, since the beginning of the 2000s, the fall in international meat prices, increasing tourism, and migration towards urban areas have also facilitated the process of forest restoration (PEN, 2009).

Figure 1.16. **Evolution of forest cover in selected countries**



Source: World Bank (2016), *World Development Indicators*.

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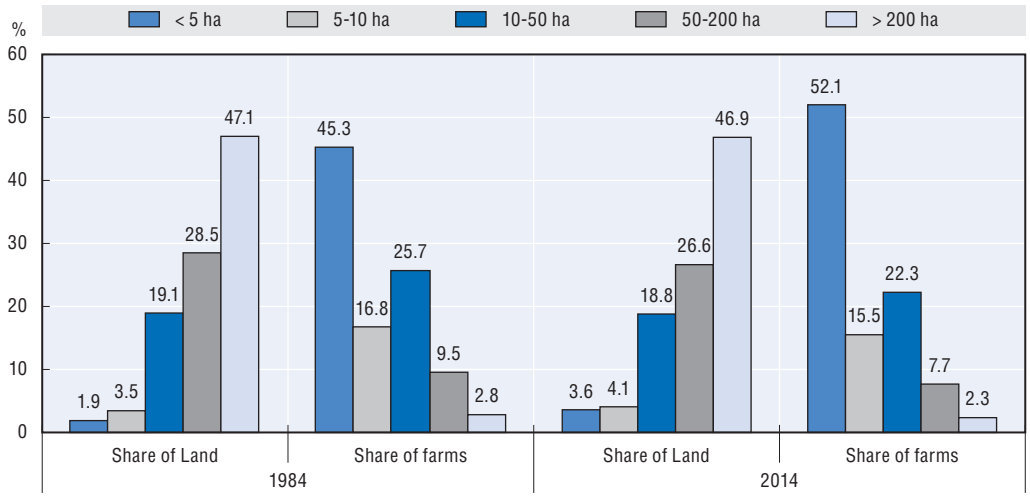
1.5. Farm structures

The majority of agricultural land is held by only 3% of all farms. The number of farms is decreasing overall, as the share and number of medium and large-scale farms has decreased. However, the number of small-scale farms is increasing. Medium and large-scale farms produce products oriented towards the high-value export market, while small-scale farms continue to produce more traditional products.

Farm size

Recent trends suggest that while medium and large-scale farms are consolidating, small farms are fragmenting – deepening the dualistic structure of the agricultural sector (Figure 1.17). Between 1984 and 2014, large-scale farms (defined as those with more than 200 ha of land) accounted for only 2.8% of all farms but owned 47.1% of agricultural land. Small-scale farms (with less than 5 ha) made up 45.3% of all farms but only 1.9% of total farm area in 1984; these shares increased to 52.1% and 3.6%, respectively by 2014. Over the same time period, the share of other medium and large-scale farms has declined (INEC, 1984; INEC, 2014).

Figure 1.17. **Evolution of land concentration**



Source: INEC, *Agricultural Census* (1984, 2014).

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This **fragmentation** and the increase in small-scale farms over recent decades are leading to a decline in average farm sizes. While the average farm size in 1984 was 30.1 ha per farm, this decreased to 25.9 ha by 2014 (Table 1.1). One explanation could be that several farms sold small plots (*quintas*), which are used for agricultural activities, but are no longer registered as farm land. Urbanisation has also led to the division of farm land and its integration into urban areas (Pomareda, 2015). Fragmentation is also increasing due to inheritance customs, which see farms divided among heirs.

Table 1.1. **Evolution of farm structure 1950-2014**

National census	Number of farms	Area of farm land (1 000 ha)	Average farm size (ha)
1950	43 086	1 815	42.1
1955	47 286	1 854	39.2
1963	64 621	2 671	41.3
1973	81 562	3 123	38.3
1984	101 938	3 070	30.1
2014	93 017	2 406	25.9

Source: INEC (2014), *Agricultural Census*.

Small-scale farms produce a broad range of products, though the majority specialise in coffee, fruits, livestock and basic grains (Table 1.2). More than one third (36.3%) of small-scale farms (defined as farms with fewer than 5 ha) produce coffee as their principle activity. 12.3% of small-scale farms specialise in fruits, which includes pineapples, as well as oranges and mangoes. Cattle (10.6%) and basic grains, including rice, beans and maize (9.8%) are also common. Other products, such as bananas (2.8%), sugar cane (1.9%), palm oil (0.6%), poultry (3.5%) and pigs (1.1%) are rare as main activities for small-scale farmers. Large shares of the production of small farms are used for private consumption (Pomareda, 2015); for example, 72% (i.e. 3 204) of the total number of rice farmers (i.e. 4 467) produce for their own consumption. A similar trend can be observed for maize (71%) and beans (65%) (INEC, 2014).

Table 1.2. **Number of farms by main activity and farm size, 2014**

Farm size (ha)	Total farms	Coffee	Banana	Sugar cane	Palm oil	Fruits[1]	Basic grains[2]	Poultry	Pigs	Cattle	Other[3]
<5	48 472	17 585	1 338	905	278	5 973	4 765	1 676	555	5 160	10 237
5-10	14 453	2 727	400	394	555	1 511	1 211	125	119	4 808	2 603
10-50	20 789	2 245	547	416	857	1 313	1 566	137	140	10 630	2 938
50-100	4 774	251	94	59	113	162	236	18	24	3 127	690
>100	4 529	153	206	100	129	167	192	7	20	2 791	764
Total	93 017	22 961	2 585	1 874	1 932	9 126	7 970	1 963	858	26 516	17 232

1. Includes pineapples, oranges and other fruits.
2. Includes rice, beans, maize and other basic grains.
3. Including vegetables, aquaculture, tourism and others.

Source: INEC (2014), *Agricultural Census*.

Large-scale farms dominate the production area for several crops for export (pineapple, banana, sugar, palm) and domestic consumption (rice). More than 90% of the area for pineapple production is held by large-scale farms of 100 ha or more. Bananas and sugar cane are also predominantly produced on large-scale farms, with 86% and 81% of production area belonging to such farms, similar to palm oil (67%). Rice, which is not an export crop but is instead directed towards the domestic market, is also dominated by large-scale farms, which account for more than 76% of the planted area (INEC, 2014).

Land concentration has increased for most products in recent decades (Table 1.3). While the area allocated to pineapples and sugar has increased, the number of farms has declined by 61.6% for pineapple and 33.8% for sugar cane. The number of coffee, rice and cattle farms decreased by more than their production area. Only for the production of bananas did the share of farms increase by more than the production area. Concentration in pineapples and palm oil may be due to foreign investment. More than 50% of pineapple plantations are controlled by Chiquita, Dole and Fresh del Monte. For palm, 60% of the cultivated area is controlled by foreign investors (FAO, 2010a).

Table 1.3. **Number of farms and farm area (ha) of selected crops in 1984 and 2014**

	Area of farms			Number of farms[1]		
	1984	2014	% change	1984	2014	% change
Coffee	89 881	84 133	-6.4	34 464	26 527	-23.0
Palm	16 830	66 420	294.7	NA	2 169	NA
Sugar cane	47 287	65 062	37.6	7 377	4 880	-33.8
Rice	86 439	58 540	-32.3	15 205	4 467	-70.6
Banana	32 316	51 758	60.2	4 229	15 924	276.5
Pineapple	2 497	37 660	1 408.2	3 197	1 228	-61.6
Cattle	1 651 561	1 278 817	-22.6	51 745	37 171	-28.2

1. As more than one crop can be cultivated in a farm, this can increase the total number of farms.

Source: INEC, *Agricultural Census* (1984, 2014).

Land ownership

Land ownership is generally high: almost 95% of all farm area is owned by the producer and property rights are secure[10]. The remaining 5% includes different forms of tenure, such as rent, payment in kind, or gratis use. The share of property ownership is slightly lower for farms with less than 10 ha (92% own their farms) and farms with less than 1 ha (87%). Nevertheless, of the 266 465 people employed in agriculture in the first trimester of 2016, 24% were self-employed, which leaves more than 200 000 as salary workers, i.e. most likely landless agricultural workers. The percentage of self-employed workers in agriculture has remained around 25% for the last five years (INEC-ECE, 2016).

The majority of farmland is under the control of **private individuals** as opposed to companies. The legal status of producers shows that in nearly all provinces, less than half of the area is managed by enterprises (*de jure* and *de facto*). San José is the province with the highest share of farmland run by private individuals (75%). In Guanacaste and Heredia, on the other hand, most farms are under some form of organisation. Not surprisingly, the share of ownership by individuals or households declines with farm size. While more than 90% of small scale farms (ha) of smaller than 5 ha are run by households, only 32% of the area of large-scale farms are so (INEC-ECE, 2016).

Indigenous farmers constitute only a minority of owners (6%) (INEC, 2014). However, given that indigenous people represent only 1% of the total population (INEC, 2013), this is a high percentage. The eight different indigenous peoples in Costa Rica hold 24 indigenous territories (INEC, 2013), each of them led by an Indigenous Holistic Development Authority (ADII) (Borge, 2008).Within the indigenous territories, there are 4 813 farms, of which 63% are managed by indigenous producers.

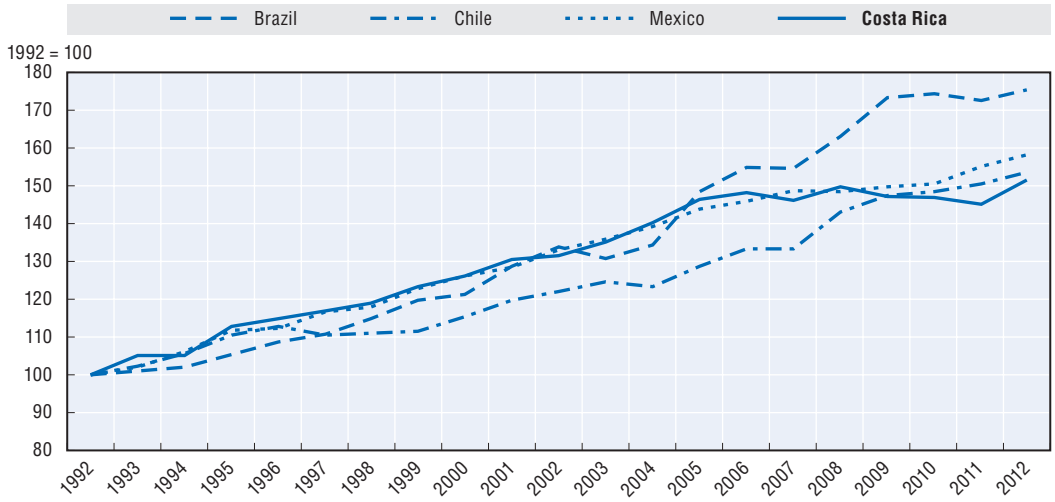
One-sixth of private farm owners are **women**. The agricultural census (2014) showed that 12 598 farms (13%) are managed by women, holding only 8.1% of farm area. Including farm land owned by legal entities, women manage only 4.4% of all farmland. 95% of all farmland run by women is private property.

1.6. Agricultural productivity

Despite the success of the export sector, a slowdown in **Total Factor Productivity (TFP) growth** over the last decade has decreased Costa Rica's competitiveness in comparison with other Latin American countries. While TFP grew faster in Costa Rica than Brazil, Mexico and Chile during the 1990s, Costa Rica now has the lowest TFP growth of the group (Figure 1.18). Between 2003 and 2012, almost 90% of output growth could be attributed to TFP growth in Brazil and Mexico; in Chile, TFP growth offset decreasing inputs. For the same time period, TFP growth in Costa Rica accounted for only 27.7% of output growth. This decline in productivity growth not only threatens international competitiveness but also indicates difficulties regarding both the productivity of the domestic sector and the inclusion of many small-scale farmers in the growth path (Fuglie and Rada, 2015).

Growth in TFP at sector level has also decreased when compared with previous decades (Figure 1.19). During the 1980s and 1990s, productivity growth drove output growth. Resource reallocation was a significant factor in the increase of TFP, as land and other resources – namely pastures previously used for livestock – were reallocated to production of non-traditional exports. However, between 2001 and 2012, output growth was driven by input use, and TFP growth declined to 1.2% a year on average.

Figure 1.18. **Trends in total factor productivity, 1992-2012**



Source: Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.

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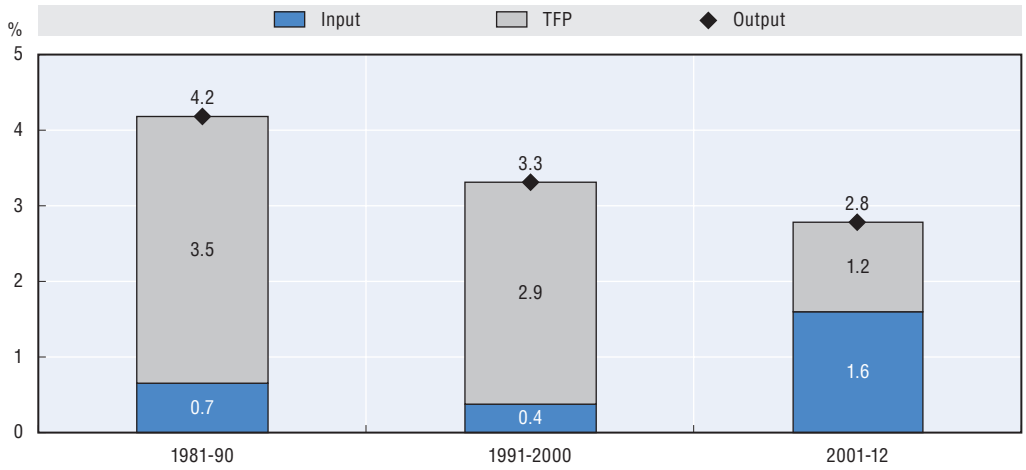
Figure 1.19. **Output growth attributable to productivity growth and growth in inputs, by period**



Source: Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.

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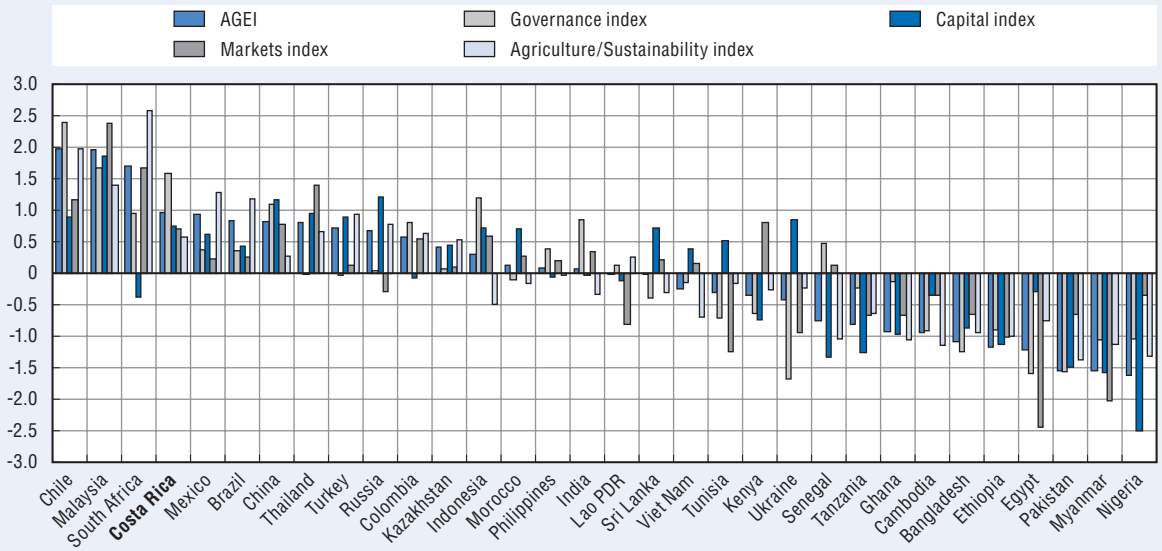
The slowdown in TFP in the last decade could be attributed to a range of factors, including limited capacity for mechanisation, due to the agricultural terrain, as well as to farm size, the expansion of some activities into more marginal land, low labour productivity (due to low education levels and lack of skills) in rural areas, limited access to credit for productivity-enhancing investments, limited access to new and more efficient agrochemicals, and poor-quality infrastructure. Several of these constraints are also identified in the Agricultural Growth Enabling Index (AGEI), a benchmarking indicator for the assessment of the enabling environment for agricultural growth across developing and emerging countries (Box 1.5).

Box 1.5. **Agricultural Growth Enabling Index**

According to the Agricultural Growth Enabling Index (AGEI),[1] Costa Rica's enabling environment for the agricultural sector performs above average, ranking seventh out a sample of 32 developing and emerging economies (see Figure 1.20 for a depiction of countries' normalised scores). Costa Rica is the top performer in the political stability component of the AGEI, contributing to a relatively stronger performance in the governance index compared with the other indexes of the AGEI. Costa Rica's performance is weakest in the agriculture/sustainability index, reflecting below-average scores for access to farm financing and capital intensification. Costa Rica also scored relatively lower (but nevertheless above average) for the financing of agricultural research and development, and land rights and access.

Figure 1.20. **The AGEI and its sub-component blocks (normalised), 2010-14**



Notes: The AGEI is comprised of four index blocks, with 40% of the weight on agriculture/sustainability factors and 20% each on broader economy-wide governance, capital and market operation. The selected indicators measure circumstances within each country around the early 2010s. To account for the differences in averages of scores of the 32 countries and the variances of these scores across the index and its blocks, this figure shows the normalised score of each country in the AGEI index and in each component block. Specifically, for the AGEI and each of its four blocks, the average for the 32 countries has been subtracted from each country value and the resulting country value divided by the standard deviation for the series, to create series with zero mean and unit standard error. For example, a value of 2 means that the observation for a given country is 2 standard deviations above the average (which is zero) for the 20 countries.
Source: Diaz-Bonilla et al. (2014).

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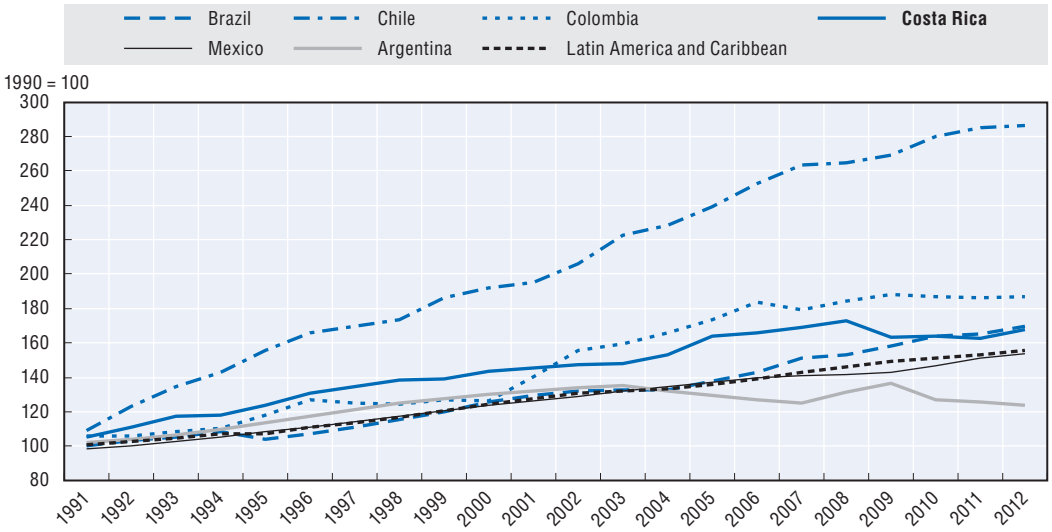
1. The Agricultural Growth Enabling Index (AGEI) can be used to assess the enabling environment for agriculture in a given country and to compare it with other countries (OECD, 2014a). The index and its four subcomponent blocks are available for 32 developing and emerging economies, including Costa Rica.

Land

Land use change has significantly impacted productivity growth. The structural reforms of the 1980s led to the conversion of pasture land for beef production to permanent crop land (for the cultivation of pineapples, among other crops) in the 1990s (Section 1.4). This shift in production towards export crops may have been the driver for land productivity growth, which has remained above the Latin American average for the last twenty years (Figure 1.21). After a slowdown between 2000 and 2003, land productivity increased at a faster pace until 2008, but has dropped in more recent years. This may reflect the end of productivity gains

from land as land allocation has met the production frontier. This is the case, for example, in pineapple production, which, given constraints on overall land availability, has been extended to less well-suited areas. Severe droughts and floods in 2008, 2009 and 2010 could also be contributing factors (Trejo, 2015).

Figure 1.21. **Growth in land productivity in selected Latin American countries**



Note: Land productivity is measured as total agricultural output (constant global-average prices from 2004-06 at constant USD 2 005) divided by the total agricultural land in "rain-fed cropland equivalents".
Source: Author's tabulation, based on Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.
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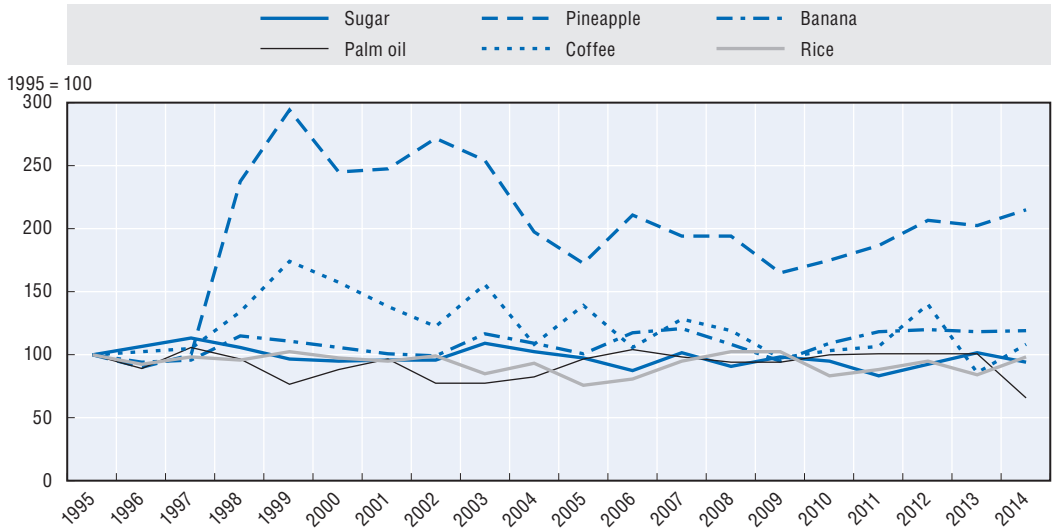
Average **yields** per ha have not increased for the main crops in Costa Rica since 1994, with the exception of pineapples (Figure 1.22). Coffee, rice, sugar and palm yields have remained close to their 1990 levels. For pineapple, average yields increased rapidly in the mid-1990s, but then decreased in the last ten years, possibly due to the extension of production to less well-suited areas. Weather events may also be playing a part; severe flooding in the Caribbean curtailed pineapple yields, especially in 2013 and 2014. Banana yields have increased to a certain extent, although flooding in the Caribbean in 2001, 2005, 2009 and 2015 slowed production (Gonzales, 2014; PEN, 2009).

Labour

Agricultural **labour productivity** has grown more slowly in Costa Rica than in many other Latin American countries over the last 15 years (Figure 1.23). Until 1997, Costa Rica's labour productivity in the agricultural sector was higher than that of most Latin American countries, including Brazil, perhaps reflecting increased productivity in the Costa Rican export sector. From 1999 to the early 2000s, however, labour productivity growth slowed in Costa Rica. Brazil, Chile and Argentina achieved higher growth rates over the same period, mainly due to mechanisation and contractions of the agricultural labour force. In addition to low levels of skills and education, the limited scope for mechanisation in some of Costa Rica's most valuable export crops (labour-intensive tropical fruits and coffee) may also be contributing to slower growth in labour productivity.

Figure 1.22. **Growth in average crop yields, 1995-2014 (index)**



Source: SEPSA (2015).

StatLink http://dx.doi.org/10.1787/888933451634

Levels of real **agricultural value-added per worker** have shown little increase between 1990 and 2012, mostly due to the large share of low-skilled workers that produce traditional crops. Until the late 1990s, Costa Rica had higher levels of value-added per worker than most Latin American countries (except Argentina) (Figure 1.24) because of its relatively high-value export products. From 2000 onwards, Costa Rican value-added growth rates remained low, but other economies – namely Brazil – achieved rapid increases. Although labour productivity is high for non-traditional crops in Costa Rica, the relatively large workforce in traditional products with lower value-added decreases the agricultural value per worker for the overall sector. The large contribution of informal labour – especially in the production of non-traditional crops – may also mean that these figures are possibly even overestimates. Nevertheless, Costa Rica is still above the Latin American average, and currently has higher estimated value-added per worker than Mexico, Chile and Colombia.

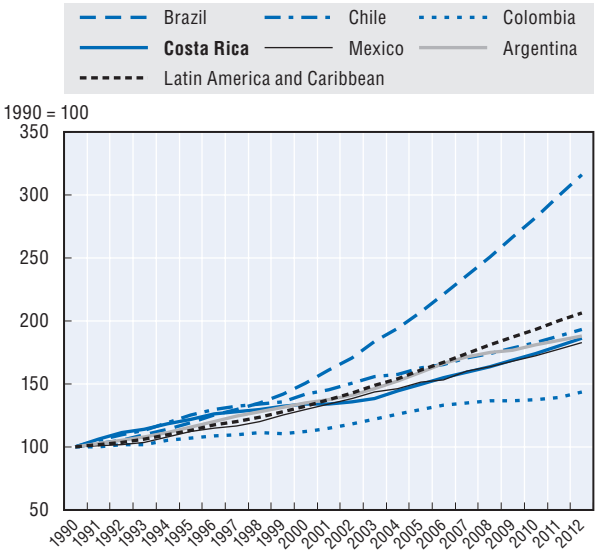
Low labour productivity growth and increases in value-added per worker are constrained by **the low skill and education levels** of the agricultural workforce. Compared to the national average of 9 years, the average schooling of those employed in agriculture for the domestic market and the traditional export sector is 5.5 years, and for those employed in the non-traditional agricultural export sector is 6.1 years (PEN, 2013). The low skill and educational levels of the rural workforce pose challenges for the improvement of agricultural productivity and movement up the supply chain or to other sectors of the economy. Low skill levels may constrain farmers in adopting more efficient and sustainable practices, in obtaining certifications required by overseas buyers, or in selling through more profitable and sophisticated channels, such as supermarket chains and hotels.

Capital

The level of **capital investment** in Costa Rican agriculture is low. Limited access to credit is a significant barrier, but low investments in mechanisation may also be due in part to the composition of Costa Rica's agricultural production and its terrain both of which afford more limited scope for mechanisation). Poor-quality infrastructure – namely roads, trade logistics, warehouses and irrigation systems – also constrains productivity growth. Furthermore,

although Costa Rica no longer has trade restrictions and has several national producers of agricultural inputs, the registration of new and efficient agrochemicals is problematic, and the use of certified seeds is small, thus decreasing productivity growth.

Figure 1.23. **Labour productivity in agriculture in selected Latin American countries, 1990-2012**

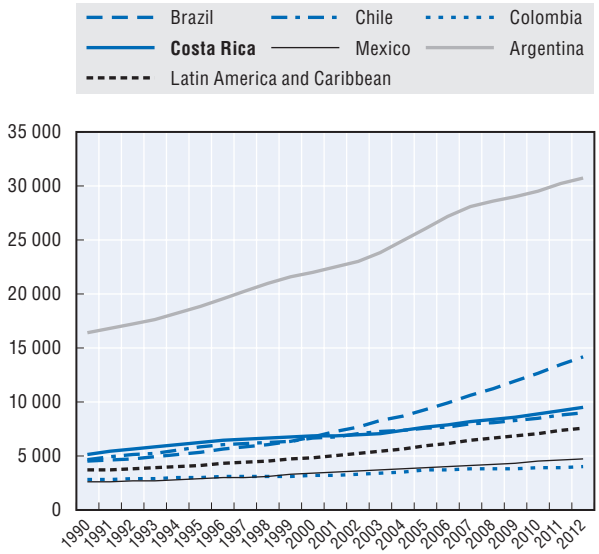


Note: Labour productivity is measured as total agricultural output (constant global-average prices from 2004-06 at constant USD 2005), divided by the total number of economically-active persons in the sector in a given year.

Source: Author's tabulation based on Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.

StatLink http://dx.doi.org/10.1787/888933451642

Figure 1.24. **Gross agricultural output per farm worker in selected Latin American countries, 1990-2012 (USD 2005)**



Note: Labour productivity is measured as total agricultural output (constant global-average prices from 2004-06 at constant USD 2005), divided by the total number of economically-active persons in the sector in a given year.

Source: Author's tabulation based on Fuglie and Rada (2015), *International Agricultural Productivity Dataset*, ERS, USDA.

StatLink http://dx.doi.org/10.1787/888933451651

Access to credit

Less than 14% of farmers receive **financing**. State banks and co-operatives provide most of the credit (around 5% each). Other sources include microfinance and private banks. The share of agricultural loans in total national credit is 2.5% (SEPSA, 2016). Comparing access to farm financing in other countries in the region, Costa Rica scores lower than Chile, Mexico, Brazil and Colombia (OECD, 2014a) (see Box 1.5 on enabling environment). The relatively low levels of agricultural finance limit farmers' ability to invest in mechanisation, innovative production methods, or to transition to alternative or higher-value products (see Chapter 2 for more information on agricultural credit).

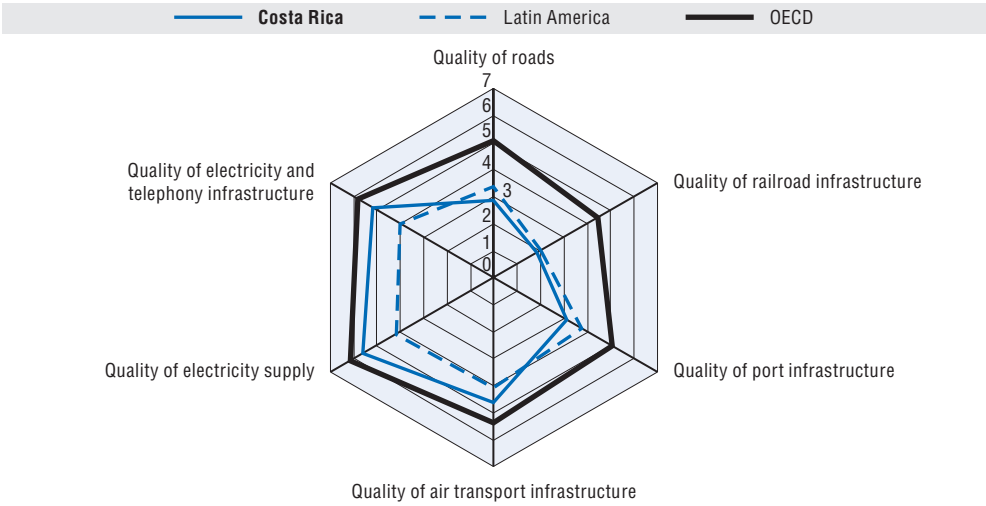
Machinery

The degree of **mechanisation** remains relatively low in Costa Rica. Only 12% of all farms use tractors, 8% ploughs, and 1% harvesters. Even for large farms of more than 50 ha, these percentages increase marginally (28%, 12% and 4%, respectively). Small machines, such as backpack spray pumps (78%) and chainsaws (34%) are more common. Only a small share of farms – mainly large-scale farms – has bio-digesters (2%) and solar panels (2%) (INEC, 2014). While some of this low level of mechanisation is not surprising, industry also argues that intensive machinery use is discouraged by high energy prices.

Infrastructure

The quality of infrastructure in Costa Rica is poor relative to other countries in the region. Although the **road** network is extensive, as a result of investments made during the 1960s and 1970s (OECD, 2013), and small towns have paved entry roads (Trejos, 2013), chronic underspending since the 1980s has led to inadequate extension of this network and poor maintenance in general. With around 68% of the national road system and around 19% of local roads paved (MOPT, 2014 and LANAMMEUCR, 2015), the WEF *Global Competitiveness Index* survey ranks Costa Rica 103rd in the world for overall quality of infrastructure, and below the Latin American average for roads, ports and railroads (WEF, 2015) (Figure 1.25).

Figure 1.25. **Quality of infrastructure in Costa Rica, 2015**



Source: World Economic Forum Global Competitiveness Report (2015/16) Database.

StatLink http://dx.doi.org/10.1787/888933451668

Agricultural exports are especially affected by poor **international and regional transport facilities and trade logistics**. The World Bank's *Logistic Performance Index* (2014) – which evaluates customs, transportation infrastructure, international shipments, logistics competences, tracking and tracing, and timeliness – ranks Costa Rica 87th out of 160 countries. Despite improving its score between 2007 and 2014, Costa Rica has declined in the global ranking. Costa Rica's lowest scores are for customs, international shipments and transport infrastructure; its best scores are in logistic competences. Compared with other Latin American countries, Costa Rica ranks below Chile, Mexico, Argentina, and Brazil, but higher than Colombia. Poor shipping services and inadequate port conditions at the main port, Puerto Limón, previously caused delays (Schwartz, 2012b), but this has been addressed with the large extension of Terminal Moín. Intra-regional trade – e.g. between Costa Rica and Nicaragua – is also delayed by poor infrastructure, as bottlenecks at the region's border crossings, mostly attributed to customs delays, increase trade costs for perishable goods (World Bank, 2011). According to the OECD *Trade Facilitation Indicators* (TFI), Costa Rica's performance in the area of external border agency co-operation and on governance and impartiality falls below best performance with 0.5 and 1.63 points respectively, where "0" is the worst performance and "2" is the best performance (OECD, 2016).

Insufficient **distribution centres and cold chain facilities** in some producing regions also reduce the agricultural sector's export competitiveness and constrain rural development. Transport costs and production losses are increasing due to lack of warehouse facilities, particularly for time-sensitive horticultural products, such as pineapples and dairy products. For instance, for pineapples exported to Europe, the World Bank estimated that product losses from time delays, rough rural roads and a lack of cooling facilities were 50% higher during transport from the farm to the distribution centre than during transport from the distribution centre to the final market in the Netherlands. Overall, the World Bank estimates that logistical costs of Costa Rica's pineapple export supply chain to the Netherlands were around 45% of the cost, insurance and freight (CIF) price in Holland, despite it being one of the most established supply chains in Central America (World Bank, 2012).

Uneven and inefficient **irrigation** systems also constrain productivity growth, notwithstanding recent off-farm improvements. Of all farms, only 20% use irrigation systems, mainly due to sufficient rainfall in large parts of the country. The largest share of irrigated farms is found in Catargo, with 29.8% (INEC, 2014). The most common technique is sprinkler irrigation, especially for pineapple production (18% of all pineapple farms). In most drought-prone areas, Costa Rica has installed large-scale irrigation systems. For example, the Distrito de Riego Arenal Tempisque (DRAT) project in Guanacaste, a drought-prone area, aims to improve sustainable water use and to increase farmer's resilience to droughts (Chapter 3). However, the efficiency of on-farm irrigation methods is reportedly low (SENARA, 2016).

The degree of **Internet penetration** is also relatively low. According to the 2014 agricultural census, only 30% of producers have access to the Internet, and only 15% use it as their main source of information. Increased internet coverage could assist in the improved dissemination of information on production practices and access to marketing channels.

Agrochemicals

Extensive use of agrochemicals – which are often obsolete – is one factor underlying soil degradation, a significant barrier to sustainable productivity growth. In 2000, Costa Rica was the largest user of agrochemicals in Central America, and one of the largest users among all developing countries (IMN, 2000). Nevertheless, the country has increased its efforts to curb the overuse of inputs and to decrease their impact on water and soil (Chapter 3). According to the National Phytosanitary Service (SFE), pesticide use has declined by nearly half[11] – from 20.1 kg of active ingredient per ha in 2008 to 10.2 kg in 2014 – since the issuance of Decree 33495-MAG-MINAE-MEIC for the Regulation on Registration, Use and Control of Synthetic Pesticides, Technical Grade Active Ingredients and Related Substances of Agricultural Use. This decree mandates procedures for the registration and control of chemical, biological or related substances for agriculture. However, according to PEN (2015), official limits on the use of pesticides are still inadequate and are not monitored by any institution.

Overuse of agrochemicals may be driven in part by **limited access to new agrochemicals**, arising from difficult registration processes. Between 2004 and 2009, only four new products were registered, due to strict import restrictions. Although a new law was issued in 2009 (Ley 8702), and import restrictions were removed, the processing of new registrations did not significantly accelerate. Since 2009, SFE approved only eight of 170 technical active ingredients and eight of 178 formulated synthetic pesticides (SFE, 2016). The registration process often takes more than four years, whereas other countries in the region – such as Chile, Mexico or Colombia – have significantly shorter registration periods of two years or less.

The long registration process in Costa Rica has led to the inefficient use of agrochemicals, and may contribute to negative impacts on the environment and productivity. Some of the challenges of getting products registered may be related to environmental concerns and to high levels of bureaucracy in the registration process. In 2016, a new regulation was proposed by both the Ministry of Agriculture and the Ministry of Environment, which is currently subject to public consultation. However, there is scepticism among farmers that much will be achieved by the new regulation, as the main challenges are seen as coming from the bureaucratic process rather than from regulation *per se*.

Certified seeds

Only a small percentage of **seeds** in Costa Rica are certified, leading to lower yields and deteriorating quality (ONS, 2016). Palm and coffee producers tend to buy certified seeds (INEC, 2014; IICE, 2013), but many small-scale banana, pineapple and rice producers use seeds from their own production. In contrast, 90-95% seeds in the United States and the European Union are certified (OECD, 2015b). The production of certified seeds is supervised by the National Seed Office (*Oficina Nacional de Semillas*, ONS), which is attached to the Ministry of Agriculture (MAG). The seeds used for the production of certified seeds are supplied by the National Institute of Innovation, Transfer and Agricultural Technology (INTA) (IICE, 2013). Another supplier of certified seeds is the National Production Council (*Consejo Nacional de Producción*, CNP).

1.7. Trade flows

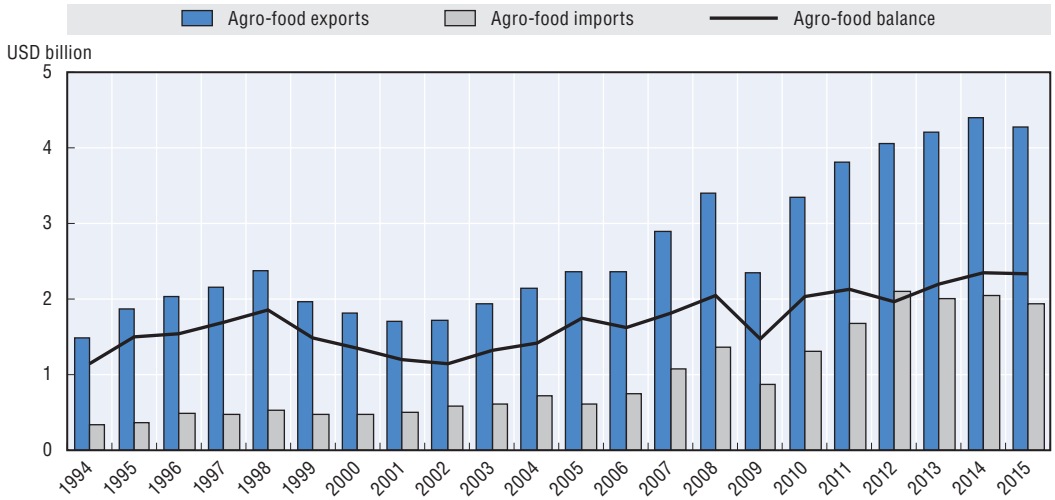
Costa Rica's stable political and economic conditions, relatively high social development indicators, outward-oriented path and structural change of the agriculture sector towards new export crops have helped to position it as a competitive supplier on the world market. However, the recent decline in productivity growth may threaten the country's strong trade position.

Agriculture plays an important role in Costa Rican trade. Between 2000 and 2015, agricultural exports (including fish and fish products) comprised between 26% and 45% of **total exports** (UN COMTRADE, 2016). A net exporter of agro-food products, Costa Rica has doubled its agro-food trade balance over the last 20 years (Figure 1.26). However, the gap between exports and imports also decreased over this period, despite the steady growth in the value of pineapple exports. In 1994, the export value of agri-food trade was more than three times higher than the import value. The value of exports decreased to almost double the import value in 2015, due to rising imports since the mid-2000s and declining export values between 1998 and 2002. Declines in export value were driven by the coffee price crisis[12] in 2001; international price falls for bananas, beef and sugar; and decreasing production in Costa Rica, due to large floods and droughts (Section 1.4). The global crisis in 2008 saw a contraction in demand from main trading partners (United States, Central America and European Union) and triggered a dip in the 2009 trade balance.

Integration of the agricultural sector within international markets is strong, and has increased over the last two decades, especially for exports (Table 1.4.). The ratio of agro-food exports to agricultural GDP increased from 127% in 1995 to 167% in 2013. By contrast, the ratio of total exports to total GDP was only 23% in 2013. For imports, integration is lower but growing, representing 25% of agricultural GDP in 1995 but 79% in 2013. Across the economy overall, the agricultural sector has become less important relative to other sectors. Agro-food exports still play an important role, but have declined from 69% of total exports (by value) in 1995 to 45% in 2015. This is indicative of the move away from the export of agricultural

commodities and towards a large range of diversified and technologically-advanced products and services, such as electronics and medical equipment (ECLAC, 2016). The share of agro-food in total imports (13% in 2015) has changed little over time.

Figure 1.26. **Costa Rica's agro-food trade, 1994-2015**



Note: Agro-food trade includes fish and fish products.
Source: UN, *UN Comtrade Database* (2016).

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Exports

The fact that Costa Rica's agricultural export success is concentrated in a few **commodities** is a potential source of vulnerability for the sector (Figure 1.27). In 1995 more than 60% of exports were traditional export commodities, such as bananas (37%) and coffee (22%). By 2015, the share of bananas and coffee had fallen to 20% and 7%, respectively. The share of new export commodities – pineapples and palm oil – were 19% and 3% respectively in 2015. Melons and sugar and its derivatives also became important exports in absolute terms.

Table 1.4. **Integration of agro-food sector within international markets, 1995-2015**

		1995	2000	2005	2010	2011	2012	2013	2015
Agriculture, Gross Domestic Product (GDP), current prices	USD billion	1.5	1.4	1.6	2.4	2.4	2.5	2.5	n.a
Agro-food exports	USD billion	1.9	1.8	2.4	3.3	3.8	4.1	4.2	4.3
Agro-food imports	USD billion	0.4	0.5	0.6	1.3	1.7	2.1	2.0	1.9
Agro-food trade balance	USD billion	1.5	1.3	1.7	2.0	2.1	2.0	2.2	2.3
Coverage degree of imports by exports	%	518	382	383	255	227	194	210	220
Share of agro-food trade in total trade									
Exports	%	69	33	33	37	37	36	37	45
Imports	%	11	8	7	9	9	11	11	13
Ratio of agro-food exports to agricultural GDP	%	127	132	145	141	159	162	167	n.a.
Ratio of agro-food imports to agricultural GDP	%	25	35	38	55	70	84	79	n.a.
Ratio of total exports to total GDP	%	23	34	36	25	25	25	23	19
Ratio of total imports to total GDP	%	27	38	46	38	44	41	37	30

Note: Agro-food trade includes fish and fish products.
Source: OECD calculations based on UN, *UN Comtrade Database* (2016); WB WDI (2016).

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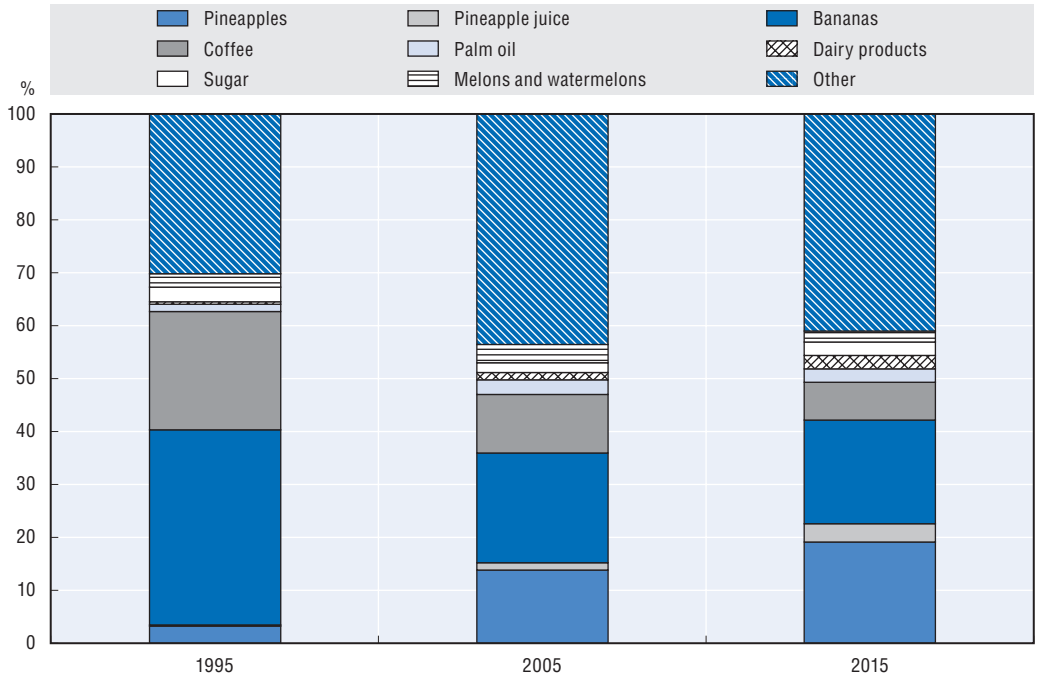
Figure 1.27. **Composition of agro-food exports (values, USD), 1995-2015**



Source: UN, *UN Comtrade Database* (2016).

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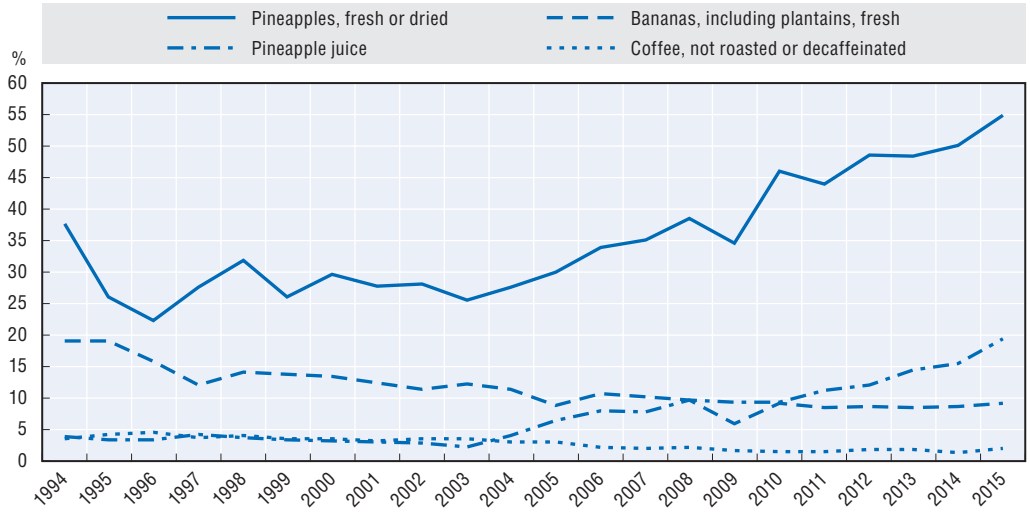
Although exports are dominated by commodities, **processed goods** have also gained in importance. Amongst industrial exports, the food industry was the second-largest exporting sector, at 22% of the total. Food industry exports have grown dramatically in the last decade, achieving a growth rate of 4% in 2014-15 (PROCOMER, 2016). Main food exports are syrups and concentrates (20%), juice and concentrates (13%), palm oil (7.8%), sauces and preparations (6.9%), pastry (5.4%) and sugar (6%) (PROCOMER, 2016). The number of products exported increased from 289 in 2006 to 342 in 2015 for the whole food industry (PROCOMER, 2016).

Costa Rica is the world's top **pineapple** producer, with a world market share of 55% in 2015 (Figure 1.28). Since 2004, it has also increased its share of pineapple derivatives, such as juice: in 2015, its share of pineapple juice reached 19.5% of total world exports. Nevertheless, the increasing number of competitors, such as Thailand and the Philippines, may challenge the advances made by Costa Rica, especially if productivity growth continues to slow.

Apart from pineapples, Costa Rica's **share in world exports** has decreased for most agricultural products in recent years. The country's world market share of bananas decreased from 19.2% in 1994 to 9% in 2015. Other products that had large world market shares have also seen decreases; for instance, manioc and melons in the last decade. Although production of sugar cane and crude palm oil has increased in recent years, Costa Rica's world market share for these products has stagnated or even declined. The share of unprocessed but high-quality coffee – a main export product – has also decreased, from 3.6% in 1994 to 2% in 2015. One explanation is the large boost in coffee production by Asian countries such as China and Viet Nam, which compete on low-quality coffee (ICC, 2015; PEN, 2015b). This has led Costa Rica to orient towards higher-quality production for the export market (PEN, 2015b) (Figure 1.28).

Figure 1.28. **Costa Rica's share in world exports of selected commodities, 1994-2015**



Source: UN, *UN Comtrade Database* (2016).

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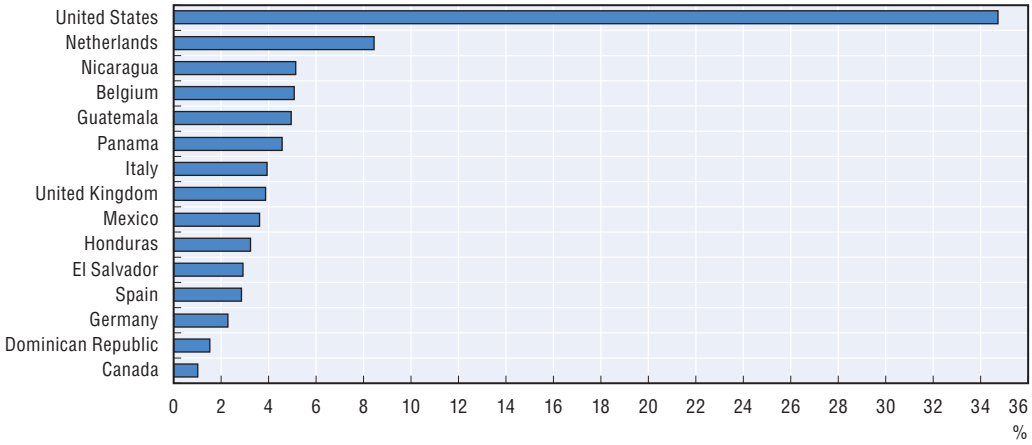
Costa Rica's main **export destination** is the United States, although exports to other countries in Latin America are increasing. In 2015, 35% of agro-food exports went to the United States. However, exports to Latin America have increased from 9% at the beginning of the 1990s to 26% in 2015. Trade agreements seem to have played a large role in the diversification of export destinations: all other member states of the Central American Free Trade Agreement-Dominican Republic (CAFTA-DR) – the United States, Nicaragua, Guatemala, Honduras, El Salvador and the Dominican Republic – are now among the top 15 export markets for Costa Rica, and account for 52.1% of all trade (UN Comtrade database, 2016). Meanwhile, the share of European destinations has been decreasing, from 45% of exports in 2009 to 26% in 2015. The main European destinations in 2015 were the Netherlands (8%), the United Kingdom (4%), and Belgium (5%) (Figure 1.29).

Figure 1.29. **Main export markets for Costa Rican agro-food products, 2015**

As percentage of total agro-food exports.



Source: UN, *UN Comtrade Database* (2016).

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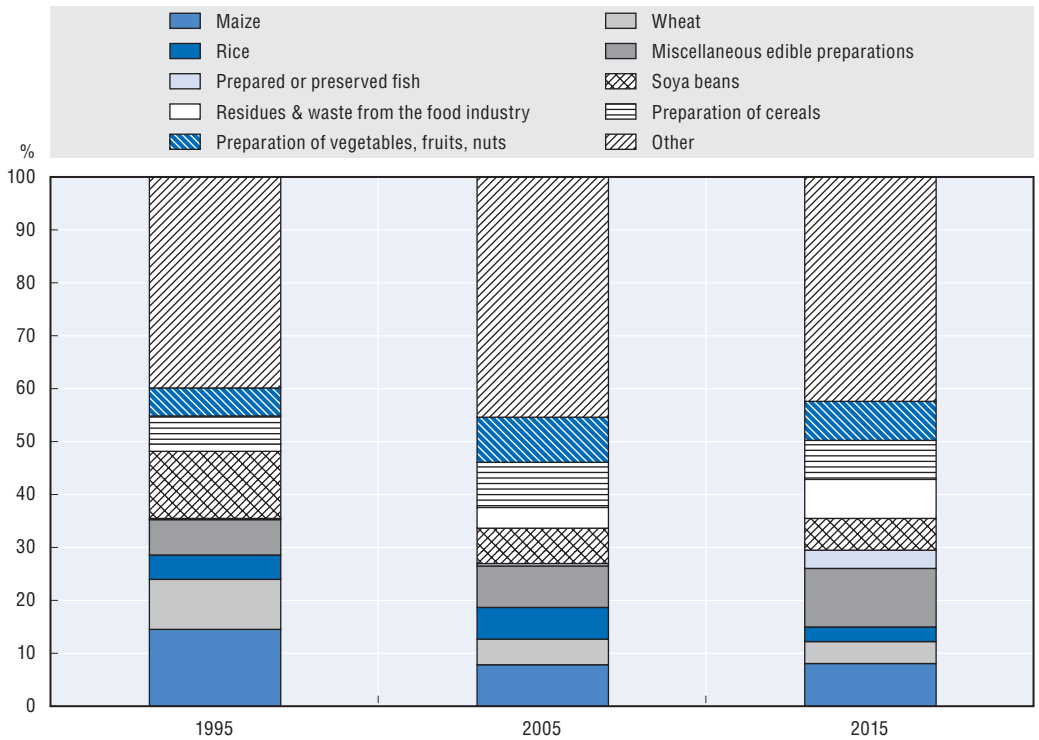
Imports

Agro-food **imports** have increased significantly over the last two decades. Imports rose from USD 0.3 billion in 1995 to USD 1.9 billion in 2015 (UN Comtrade database, 2016). Growth accelerated particularly sharply between 2004 and 2015, excluding a slowdown in 2009 due to the global economic crisis.

Basic staples for domestic consumption dominate imports, although their shares in agro-food imports are declining. Maize, soya, wheat and rice were the most important agro-food imports in 1995; their shares declined in 2015 (Figure 1.30), but volumes increased in absolute terms. For instance, the share of maize decreased from 15% in 1995 to 8% in 2015. Nevertheless, it has remained the largest component of Costa Rica's import composition. Wheat and soya beans imports, dominant from 1995 (10% and 12% respectively), fell to 4% and 6% in 2015.

Despite declining import shares, Costa Rica still relies on grain imports to satisfy domestic consumption of wheat, yellow maize, and soybeans. Other key imports are chicken, pork, and dairy (included under the "other" category), as well as bakery products. Significant imports of rice and dried beans are also necessary to meet local demand. In 2011-12, 31% of rice consumption (in value terms) had to be imported (IICE, 2013). Moreover, prepared and preserved fish imports have increased from a marginal share in 1995 of 0.3% to 3% in 2015 (see more details in Box 1.6). Rising imports signal a greater dependency on international markets, especially for grains (PEN, 2015b). One explanation for the rise might be a change in consumption patterns towards more processed goods, such as prepared fish. Furthermore, as imports also often underpin exports, part of this growth could be associated with export growth.

Figure 1.30. **Composition of agro-food imports (values, USD), 1995-2015**



Source: UN, *UN Comtrade Database* (2016).

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Box 1.6. **The importance of fisheries in Costa Rica**

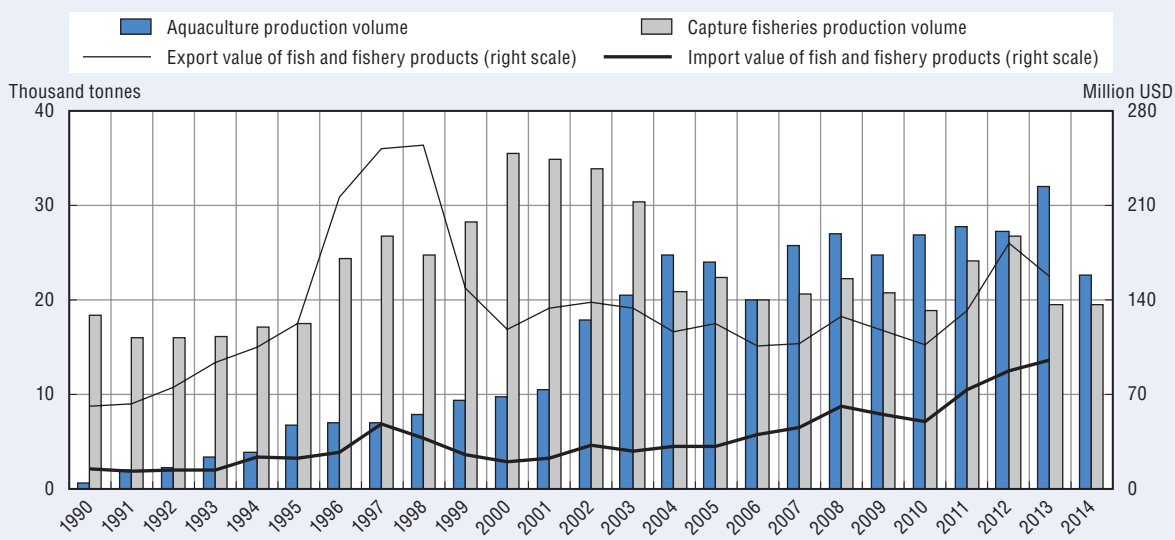
The Costa Rican fishing industry has social and economic importance as a source of foreign exchange, and as a contributor to employment in the generally economically-depressed and marginal coastal areas of the country.

From 2000 to 2010, the contribution of fisheries and aquaculture to GDP was 1.4% (INCOPESCA, 2016). Fish exports have more than doubled – from USD 61.3 million in 1990 to USD 157.2 million in 2013. Fish imports have increased six-fold – from USD 15 million to USD 95.1 million – over the same period (Figure 1.31). Rising imports are consistent with rising domestic consumption[1]: per capita consumption of fishery and aquaculture products (kg/person/year) has increased from 9.04 kg per capita in 2000 to 13.77 kg in 2010 (INCOPESCA, 2016).

Marine fisheries continue to be important, both socially and economically. Within the fisheries sector, marine fisheries create not only the majority of jobs, but also the most foreign exchange. Total volume of fisheries capture grew from 18 370 tonnes in 1990 to a peak of 35 463 in 2000, and then declined to 19 508 in 2013. On the Pacific coast of Costa Rica, there are five main landing points for fishery products and many other smaller ones in the surrounding area (INCOPESCA, 2016).[2] In the Caribbean, there are two main product landing sites near the border with Nicaragua and Puerto Limon.

Aquaculture has increased significantly in recent decades, from 573 tonnes in 1990 to 31 972 tonnes in 2014 (primarily of tilapia, trout, shrimp and prawn). Taking advantage of the DRAT's irrigation canals in Guanecaste, aquaculture has become an important industry. Although production is concentrated in that region, tilapia is cultivated throughout the country. Production is mainly exported to the United States. Other cultivated species in Costa Rica are marine shrimp, giant Malaysian shrimp, trout, catfish, and several species of carp. Although efforts have been made to improve marine fish cultivation, there are no major commercial projects (INCOPESCA, 2016)

Figure 1.31. **Fisheries production and trade in Costa Rica, 1990-2014**



Source: FAOSTAT (2016).

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Responsibility for the fishing sector lies with two state institutions. The Costa Rican Institute of Fishing and Aquaculture (INCOPESCA) manages marine fisheries resources and encourages the development of aquaculture in inland and marine waters. The Ministry of Environment and Energy (MINAE) manages inland

Box 1.6. **The importance of fisheries in Costa Rica** *(cont.)*

fishery resources, the use of which is restricted to sports fishing and subsistence. In 2012, the Vice Ministry of Water, Oceans, Coasts and Wetlands was created to improve the governance and management of oceans and freshwater.

For many years, small-scale fisheries, particularly on the Pacific coast, have been absorbing labour from the agricultural and livestock sectors as these underwent structural reforms. This increase in fishery activities has imposed significant pressure on coastal fishery resources, but has reduced poverty on the periphery of major cities, especially San José. In the small-scale artisanal fisheries found along the coastal areas, more than 2 421 vessels are properly registered, although there are undoubtedly more vessels that are operating informally (INCOPESCA, 2016).

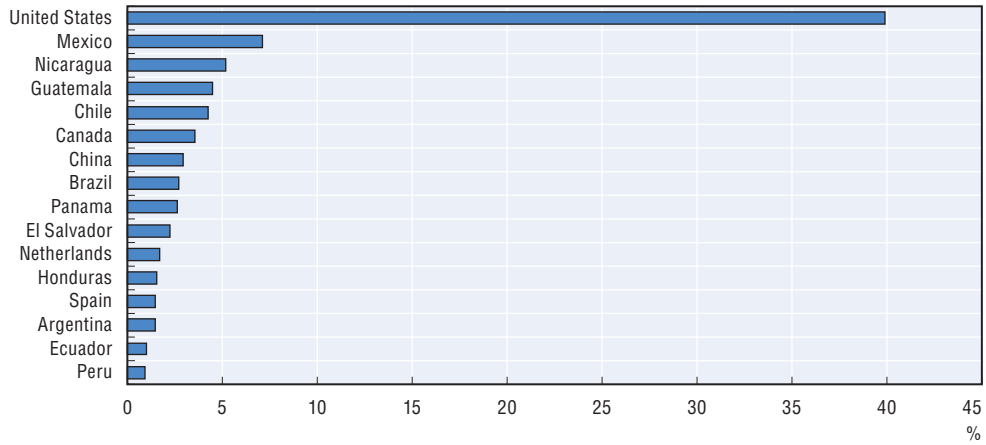
1. Consumption is calculated based on whole fish as the raw material. Consumption does not include tuna, which are captured by foreign fleets. However, according to representatives of the canned tuna industry, consumption of tuna is high.
2. Cuajiniquil, Coco Beach, Puntarenas, Quepos and Golfito.

Source: INCOPESCA (2016).

Similar to exports, **imports** – while still concentrated on products from the United States – have shifted to Latin America and China to some extent (Figure 1.32). The United States' share of imports was 40% in 2015, falling from 54% in 1995. Imports from other Latin American countries increased from 30% of total imports in 1995 to 35% in 2015. Mexico was the largest provider (7%), followed by Nicaragua (5%) and Guatemala (4.5%) in 2015. In aggregate, the CAFTA-DR countries accounted for 53% of all imports in 2015. Imports from China have also increased, reaching 3% in 2015 (see Chapter 2 for a more detailed discussion on trade policy).

Figure 1.32. **Main suppliers of agro-food products to Costa Rica, 2015**

As percentage of total agro-food exports.



Source: UN, *UN Comtrade Database* (2016).

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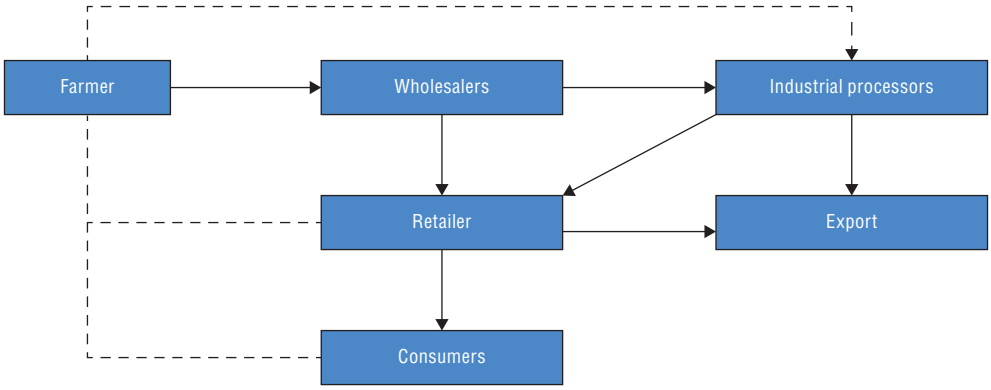
1.8. Upstream and downstream sectors

Marketing channels for major commodities

Marketing channels connect farmers with the commercialisation of their products. Figure 1.33 displays the market chain linkages for agricultural commodities in Costa Rica. The main stages include producers, wholesale markets and distributors, and retailers. Depending

on the commodity, additional stages can include industrial processors and/or exporters to international markets. Although agricultural production has diversified towards more processed goods in recent years, agricultural commodities are still often directly marketed without further processing (Hidalgo, 2009). The marketing channel for each commodity depends on the individual characteristics of the product market, and can be significantly more complex than the standard model.

Figure 1.33. **Standard marketing channel for agricultural commodities in Costa Rica**



Source: Based on MAG (2007a), MAG (2007b) MAG (2007c).

The dualistic structure of the domestic and export sectors is also evident in the marketing channels, with the majority of small-scale farmers poorly integrated into marketing chains and receiving only a small share of the price paid by consumers. According to the agricultural census, many farmers produce small amounts of basic grains, such as rice (72% of all farmers have some sort of rice production), or fruits for own consumption. For the non-traditional exports, the share of farmers producing small amounts for personal consumption is lower – for example, 35% for pineapples and 45% for sugar cane (INEC, 2014). Furthermore, according to MAG (2016), farmers receive a relatively small share of the price paid by consumers for certain products. For example, potato farms receive 37% of the price paid by consumers, with the balance (63%) captured by intermediaries; the farmer share is similar for beans (35%) and onions (around 30%).

Linkages between small-scale farmers and the agro-food industry are limited for most agricultural products, but have improved in the case of a few industries, such as coffee. For some large industries – such as pineapples and bananas – production and commercialisation are largely separated. Constraints to farmers' participation at more advanced levels of these marketing chains could relate to infrastructure, notably storage facilities and transport, as well as education levels. Varied levels of support from agricultural supply chain organisations also have implications for farmer participation in the supply and marketing channel (Chapter 2). In the case of coffee, for instance, support from the coffee organisation ICAFE has helped to integrate more farmers into the marketing channel (Box 1.7).

Agro-industry

The agro-industry is growing, and is increasingly playing an important role as an alternative source of employment for agricultural workers (USDA, 2015). The local food industry consists of 20% large companies and 80% small- and medium-sized companies (USDA, 2016). Bakery products represent the largest percentage of products produced by

processing firms. Additional processing activities include milling, the processing of meat and meat-products, fruits and vegetables, dairy products, soft drinks and juice, confectionary and chocolate, and fish and seafood processing (USDA, 2015).

For some farms, agro-industry is the main purchaser. Agro-industry is especially important as a buyer for palm (62.6% of farms), coffee (61.7%), and sugar cane (34%). Fresh fruits, such as pineapple (12.9%) and banana (2%), are less likely to be purchased by the processing industry (INEC, 2014).

Box 1.7. **Case study of marketing chains**

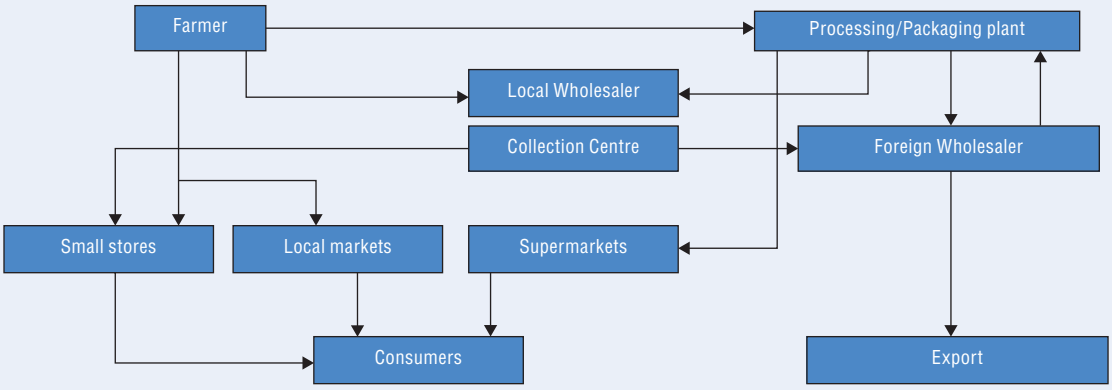
Pineapple

The pineapple supply chain in Costa Rica is highly standardised and – similar to bananas – an example of a successful export product. Production can either be oriented towards the local market or, alternatively – directly or indirectly – for exports. Figure 1.34 illustrates the different linkages for the pineapple marketing chain.

In 2014, there were around 1 230 pineapple farms (INEC, 2014). Just over a third (35.5%) of pineapple farmers – but only a small percentage of total production, at 9% – produce for local markets. If not directly sold on local markets, most producers deliver their products to collection centres (*centros de acopio*), often owned by large supermarkets or producer organisations (CPN, 2015). Alternatively, producers can deliver to packaging companies, which often have their own quality control, and often review the production process and provide technical support (MAG, 2007c). Seventeen of these packaging farms are located in Huetar Norte, a region with more than 90% of small and medium-scale farms.

From the packing plant, pineapples go directly to certified exporters. In total, 47% of pineapple production was sent to exporters in 2007 (FAO, 2007). Pineapples that are rejected for export are sold on local markets or go into the agroindustry for further processing, either for the international or the local market (MAG, 2007c). Some farms (13%) also sell directly to agroindustry (INEC, 2014).

Figure 1.34. **The pineapple marketing chain**



Source: Based on World Bank (2012), MAG (2007c), SEPSA (2010).

The separation of the production and processing stages of the marketing channel leaves little opportunity for pineapple producers to gain from potential value added. To improve the situation, MAG is planning to increase producer participation in the processing process within the country (MAG, 2011).

Coffee

Vertical integration is more present within the coffee industry. ICAFE is the corporation that has contributed to the integration of the value chain, by providing services such as technical assistance, extension, research and development and marketing and promotion services. In 2014, there were 26 527 coffee farms (INEC, 2014), 88% with less than 10 ha. Typical coffee processing consists of milling and roasting. Of 215 processors,

Box 1.7. **Case study of marketing chains** *(cont.)*

147 are "microprocessors", processing 4.3% of national production (ICAFE, 2015). There are 172 millers, of which 57 are small with an output of less than 3 000 bushels, and the number of small millers is increasing. New farms that were built with the support of a MAG programme, the National Program for Sustainable Agricultural Production, installed micro mills directly on their farms (FAO, 2010b). These represent 3% of coffee produced; 38% is produced by medium-scale producers, which also process more than half (52%) of the total harvest. Large millers represent only 5% of coffee production, but nevertheless also process 44% of the harvest (IDB, 2014). 30% of mills also roast coffee. In total, there are 57 roasters registered, of which 16% are co-operatives, thus increasing the market power of producers. The increasing number of roasting mills reflects producers' efforts to capture the value added by roasting and branding (IDB, 2014), thereby supplying the national market with several coffee brands.

Coffee for export, however, remains unprocessed. Small-scale coffee farmers also participate in the export of their products. 70% of all exporters are small-scale operations. Of 336 coffee exporters, 7% are co-operatives (IDB, 2014). For those coffee farmers that are integrated into processing, profit margins are higher compared to those in other coffee-producing nations. In 2010, producers that ceased to deliver to large-scale processing farms, and instead installed their own processing mills, obtained prices per quintal (46 kg) that were up to USD 100 higher than on the New York Mercantile Exchange (FAO, 2010b). Furthermore, legislation ensures that producers profit from the high profit margins that can be achieved by processing the beans. Profit margins are set at 9% for millers and at 2.5% for exporters. Producers receive around 80% of the international reference price (IDB, 2014).

Rice

In contrast with pineapple and coffee, rice is not an export commodity in Costa Rica. Hence, fewer producers and more importers participate in the marketing channel. Commercial rice is grown by 940 farmers (although, according to the 2014 agricultural census, the total number of rice producers is 4 467), with a total of 58 197 ha, around 4% of agricultural land (CONARROZ, 2016).

The rice processing industry receives special protection and is highly concentrated. There are a total of 15 rice mills located near producing areas, especially in Guanacaste. In 2011-12, 15 agro-industrial enterprises, two mills and four factories were owned by the State National Production Council (CNP). Producers and millers are represented by CONARROZ, an influential group which has lobbied to maintain the import tariff and additional protection for the industry (Chapter 2). The owners of the mills are represented by ANINSA, a body focused on the interests of the rice industry (IICE, 2013). Since the 1960s, market concentration in the rice industry has increased (IICE, 2013). The largest four rice processing enterprises increased their market share from 54.4% in 1999-2000 to 70.3% in 2004-05. While their market share decreased to 50.7% in 2012 (IICE, 2013), this still represents a high degree of market concentration.

Some rice processing companies have linkages to rice production through their own or rented farms, or by financing in exchange for production (IICE, 2013). A 2012 study conducted by IICE in the area of Chorotega and the Central Pacific region in general found that 21% of the farmers interviewed received some kind of financing from the rice industry (IICE, 2013). Other rice processors are also involved in the wholesale and retail process.

Source: World Bank (2012), MAG (2007c), SEPSA (2010), IICE (2013), FAO (2010), IDB (2014), ICAFE (2010).

Wholesaling and retailing trade

Short marketing circuits minimise marketplace intermediation and connect local food suppliers directly to demand. Traditional markets, for example, are often the easiest way for farmers to directly distribute their products, especially for vegetables and fruits. There are about 13 000 traditional markets in Costa Rica (USDA, 2016), including around 70 farmer markets run by the CNP (CNP, 2015).

The most important traditional market is the national wholesale market (*Centro Nacional de Abastecimiento y Distribución de Alimentos*, CENADA), which is the main wholesale market for fresh agricultural produce and an important connection between small-scale farmers and the domestic market. It is located close to Heredia, about 11 km outside of the capital San José, which connects CENADA to the main roads in the country. CENADA has a well-developed infrastructure, including different market halls with storage areas for wholesalers and fixed selling areas for different products (Jansen, 1996). Around 250 000 tonnes of produce are sold annually at this market, of which 42% are fruits, 56% vegetables, and 2% fish and seafood (PIMA, 2015). Three new large wholesale markets at the regional level are also planned[13] (PIMA, 2015).

However, only around 20% of final consumers purchase directly on local markets, and retailers such as local shops and supermarkets are more important. A study conducted by PIMA (2013) found that in 2012, 22.1% of households continued to prefer buying fruits and vegetables at farmers' markets. A roughly equal percentage of households (21.2%) purchased these goods from supermarkets. The next group of households (19.1%) purchased fruits and vegetables from independent greengrocers, which in turn often purchase their goods from large wholesalers or at CENADA. Other retailers in the same category – such as municipal markets, mini-supermarkets, peddlers, or smaller traditional stores (*pulperías*) – account for around 8% of purchases. To support small-scale farmers, there are also wholesale companies under the state programme (PAI) that purchase from small- and medium-scale farmers in order to supply the public sector (CNP, 2015).

Supermarkets have become increasingly important, importing a rising share of their products directly. At present, 40% of food purchases by Costa Rican consumers are made at supermarkets (USDA, 2016), and the sector is growing. Supermarkets have reported sales growth of 20% in the last two years (USDA, 2016). The five main supermarket chains, with more than 350 supermarkets are Wal-Mart (United States), Gessa (Costa Rica), AutoMercado (Costa Rica), Price Smart (United States), and Megasuper (Colombia). 55% of the food sold in supermarkets is imported (USDA, 2016). Products from national producers are often purchased via collection centres that are managed by the supermarkets (Pomareda, 2015).

Smaller traditional stores (*pulperías*) are also common, but their number is decreasing. There are more than 20 000 traditional stores across Costa Rica (Pomareda, 2015). They have a more limited selection of goods, but are located in more remote areas. Nevertheless, the presence of small convenience store chains, such as AMPM, Fresh Market and Vidi, is increasingly replacing the traditional *pulperías* (USDA. 2016).

1.9. Summary

- Costa Rica's **democratic tradition** and **economic strength** have provided a stable environment for the development of the agricultural sector. Political stability, strong social indicators and secure land property rights have helped to attract foreign direct investment (FDI). Costa Rica's economic performance has been above the regional average, with low inflation and low unemployment. The global crisis in 2009 hit Costa Rica hard, however, and although the economy recovered rapidly, high unemployment has persisted and the budget deficit has significantly increased, limiting fiscal space for further investments, including in agriculture.
- While Costa Rica's **poverty** rate is lower than in most Latin American countries, the incidence of poverty – as measured by the *national* poverty lines – has not improved over the last 20 years. Rural poverty rates remain above the national average, and have even increased in recent years.

- Costa Rica is rich in **biodiversity**, and fertile land and climate conditions are favourable for a diverse range of tropical crops, including pineapple, bananas and coffee. However, Costa Rica is highly **vulnerable to climatic events**, and **agricultural land remains scarce**. Competition for land resources has increased in recent decades, with pressure to convert farmland into non-agricultural uses, such as tourism, residential areas and reforestation. While Costa Rica is a **water-**abundant country, water scarcity is also a growing challenge in certain agricultural regions.
- The **agricultural sector** continues to play an important role in the Costa Rican economy, particularly for exports and employment. In 2013, the share of agriculture in GDP was 5.6%, while 12.7% of the labour force was employed in the agricultural sector, and agricultural exports accounted for 37% of all exports.
- Building on the country's outward-oriented growth strategy in the 1980s, the agricultural sector has transformed and developed a **successful and dynamic export sector**. Costa Rica is a leading exporter of pineapples, but also remains a successful supplier of traditional products, such as bananas, coffee and sugar.
- The agricultural sector is characterised by a **dualistic structure**. There have been limited spillovers from the successful non-traditional export sector (and, to a lesser extent, traditional export sector), dominated by large farms, to the domestic market, mostly served by small and less competitive farms. This dualistic structure is contributing to rising inequality and persistent poverty in rural areas. This suggests that attention needs to be given to issues of **adjustment** for smallholders in the context of the larger structural adjustment process in the sector and the economy.
- **Land ownership** is concentrated: 47.1% of the land is held by 2.8% of large-scale farmers (with more than 200 ha). Farmland for successful export crops is owned by large-scale farms. The only exception is coffee, where most of production comes from small-scale farmers. The number of farms with fewer than 5 ha has increased, and smaller farms are fragmenting even further.
- Following trade opening, **agricultural output** increased, predominantly due to impressive growth in the production of non-traditional exports as well as less land-intensive livestock production. For example, pineapples increased their share in total agricultural value at the expense of bananas and coffee in particular, and the share of livestock (beef, pig, poultry and milk) also increased. While Costa Rica was an early mover in the organic sector, **organic production** remains marginal, at around 1.6% of total production.
- **Productivity growth** has also stagnated in recent years across the sector, and is low compared to other Latin American countries. Causes include increasingly severe natural hazards, use of more marginal land (for pineapple production, for example), low labour productivity, poor infrastructure, limited access to credit and the ineffective use of agrochemicals due to delays in registration. **Infrastructure**, in particular transport infrastructure, is identified by various indices (WEF, AGEI) as one of the strongest constraints to Costa Rica's competitiveness. Limited investment in the transport system against a backdrop of rising natural hazards has led to the deterioration of road quality. Although Costa Rica has historically had a high-skilled **labour force**, which has contributed to its competitiveness, educational outcomes for agricultural sector workers are poor. The level of **capital investment** in Costa Rican agriculture is also low, with limited access to credit and low investments in mechanisation, partly explained by the composition of the country's agricultural production basket.

- Costa Rica is an **open country**, a **net exporter** of agricultural goods and world leader in pineapple exports, with a world market share of over 50%. Exports as well as imports strongly rely on the United States as a trading partner, although the CAFTA-DR regional trade agreement with several Central American countries, the Dominican Republic and USA has led to intensified trade among this group. Agricultural exports have significantly increased in the last decade, chiefly for pineapples and pineapple by-products. Costa Rica's imports are heavily commodity based (maize, soya, wheat and rice).
- The majority of **marketing channels** are characterised by very limited, if any, integration of farmers in the further processing stages. One exception is the coffee sector, where several farmers have begun to process and market higher-value products. Generally, the agro-industry is growing, but continues to be specialised in a few products such as concentrates and juices. Supermarkets are meanwhile gaining more influence in the local marketing channel.

Notes

1. The Costa Rican traditional agricultural export sector is characterised by products such as bananas, sugar and coffee. Non-traditional agricultural export products include pineapple or palm oil. Traditional domestic agriculture is meanwhile characterised by staple foods such as rice, beans, local fruits and vegetables (SEPSA, 2016).
2. The index ranges from zero (least restrictive regime) to one (most restrictive). The higher the value of the index, the more obstacles there are for inward FDI (OECD, 2014b). In Costa Rica, the manufacturing sector was found to have the least restrictive regime (0.017), followed by the tertiary sector (0.05). The primary sector was found to be the most protected (0.10), mainly due to the high protection of the mining sector (0.34). Fisheries displayed low levels of restrictions for FDI (0.05).
3. ECLAC (2013) estimates that by 2024, the elder generation's (60 years and older) national consumption will overtake that of the 19 years and younger category.
4. The Orshansky coefficient is the inverse of the income share spent on food items. The coefficient was updated from 2.07 to 2.5 for urban areas, and from 1.97 to 2.30 for rural areas, based on income and expenditure surveys conducted in 1988 and 2004. Another modification included the update of the food consumption basket, including 16 (11) new items and excluding 8 (6) items in urban (rural) areas. The cost of the non-food consumption basket is obtained by multiplication of the cost of the food basket and the corresponding Orshansky coefficient (INEC, 2010a). This increased the cost of the urban consumption basket by 13% and of the rural consumption basket by 10%. Based on data from an experiment using the new methodology with 2009 data (INEC, 2010b), the methodology change accounts for almost all of the change in poverty in urban areas (98.9%) but for less than half (46.3%) of the change in rural areas.
5. This includes forest conservation land on farms.
6. The *El Niño* Southern Oscillation (ENSO) consists of three phases: *El Niño* (warm phase), *La Niña* (cold phase) and the neutral phase. On average, *El Niño* and *La Niña* occur every three to five years. At the extreme, they happen every two to seven years. Normally, *El Niño* lasts nine to 12 months. In exceptional cases, it can last up to four years (1991-94). *La Niña* is more persistent, lasting from one to three years. Both phenomena typically start between March and June, and reach their maximum effect between November and February (see Chapter 3 for more details).
7. This trend is consistent with a widening wage gap between agricultural income and the national average wage. In 2010, average monthly agricultural income corresponded to 70% of the national monthly average; this figure declined to 61% in 2014. A similar trend can be seen in rural areas: the monthly average wage in the agricultural sector decreased from 84% of the national average in 2010 to around 74% in 2014 (INEC-ECE, 2016).
8. Permanent crops refers to crops that are not destroyed when harvested but able to produce again, such as coffee, sugar cane, palm, pineapple and bananas.

9. "Traditional" in this context should be understood to mean agriculture that involves the use of traditional agricultural practices and machinery, as opposed to the production of "traditional" product types previously referred to in this report. Furthermore, traditional agriculture is also associated with smallholder agriculture, poorly capitalised and with relatively low levels of productivity (OECD, 2015).

10. Costa Rica has a clear legal framework on property (FAO, 2010a). Legally, property in Costa Rica can be distinguished between private property and communal property. For the latter, two models can be identified: agricultural settlements and local indigenous communities. Agricultural settlements were established in Costa Rica in the early 1950s, but it was only in 1962, with the creation of the ITCO (Institute for Lands and Colonization), that the process became regularised and protected by law. Later, in 1982, with the creation of the Institute of Agrarian Development (IDA), the process of titling was accelerated. It is currently estimated that there are 780 land settlements and almost 40 000 parcels of 5 to 7 ha each. The exact number is unknown, as many of those who received the parcels sold these after a few years, as authorised by law (Pomareda, 2015). Nevertheless, there are some deficiencies in property rights. Ramirez and Villalobos (2014) have analysed the cantonal regulation plans (PRC) and identified various legal and institutional factors that limit the territorial system, such as deficiencies in institutional co-ordination, absence of institutional resources and conflicting norms.

11. According to FAOSTAT, fertiliser levels have also declined dramatically, from 259 tonnes per 1 000 ha in 2005 to 129 tonnes in 2010 – however, these statistics are estimates based on purchase levels – including imports-exports and fertiliser for non-agricultural purposes – and thus are not reliable measures of fertiliser use. SFE is currently reviewing the measurement methodology.

12. Coffee prices dropped sharply in 2001, due to an imbalance between supply and demand for coffee (ICO, 2002).

13. The three new markets are planned for the regions of Chorotega, Brunca and Huetar Caribe. A previously-planned fourth market in Huetar Norte has been cancelled.

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Chapter 2

Trends and evaluation of agricultural policies in Costa Rica

This chapter reviews the framework, key policy objectives and institutional arrangements for agricultural policy in Costa Rica. It provides an overview of relevant policy developments since the 1980s, after which it describes domestic agriculture-related policies, followed by an examination of trade policies relating to the agro-food sector. The subsequent section estimates support provided to agriculture and the cost that these policies impose on consumers and taxpayers. The main conclusions of the chapter are summarised in the final section.

2.1. Introduction

Over the past 30 years, Costa Rican agricultural policies have focused on the integration of the sector within international markets and the management of responses to external shocks, such as high commodity prices and natural hazards. Other objectives have included the sustainable use of natural resources, improvement of farmers' living standards, strengthening of domestic market supply chains, and modernisation of agricultural institutions. In the wake of the food price crisis of 2007-08, Costa Rica has emphasised food security as an objective, requiring – in particular – the improvement of living conditions in rural areas and an increase in agricultural productivity. At the same time, Costa Rica has continued to promote agricultural exports as part of a trade liberalisation process.

There are a range of bodies involved in the governance of the agricultural sector in Costa Rica. The Costa Rican Agricultural Public Sector (APS) is composed of several institutions, including the Ministry of Agriculture and Livestock (MAG). The Minister of Agriculture is in charge of the design and implementation of agricultural policies in co-ordination with all APS institutions. Furthermore, the Minister sits on the Board of Directors of public-private entities called "*corporaciones*" which represent producers of some key agricultural products.

Costa Rica provides relatively low levels of agricultural support compared with other OECD members. Input subsidies are limited, and aimed at fixed capital formation and on-farm services, while budget transfers are relatively low and largely (around 80%) take the form of less-distorting general services to agriculture, including extension services, plant and animal health services and irrigation investments. There are also minor direct payments for environmental services. However, there are issues with the efficiency and impact of some of these government services. Moreover, although only 10.1% of gross receipts of agricultural producers in Costa Rica – as measured by the percentage Producer Support Estimate (%PSE), the ratio of policy-related transfers from taxpayers and consumers to gross farm revenues – were provided by support policies over 2013-15, compared with an OECD average of 17.6% for the same period, this support is highly distorting, consisting mainly of Market Price Support (MPS). MPS – for rice in particular, but also for poultry, sugar and pig meat – accounted for 97% of the PSE in 2013-15.

Tariffs are the main instrument for trade protection for Costa Rica's agricultural sector, although they have declined since Costa Rica joined the WTO in 1995. Between 1995 and 2014, the Most Favoured Nation (MFN) average tariff for agricultural goods decreased by 31%. Nevertheless, agricultural tariffs remain high compared to total trade, or tariffs on industrial goods and petroleum. The average MFN tariff for agricultural goods in 2014, for example, was 11.5%, well above the average MFN tariff for total trade (5.8%) and industrial goods (4.8%) (WTO, 2016).

This chapter provides an overview of policies and support to the agriculture sector in Costa Rica. It has four sections. The first provides an overview of agricultural policy in Costa Rica, describing the main policy developments since the 1980s, identifying key current policy objectives and outlining the relevant public and private sector institutions

and organisations (the institutional landscape). The second section discusses domestic policy measures that provide support to agriculture: policies that provide direct transfers to farmers – price support, input support or direct payments, which are used to calculate the Producer Support Estimate or PSE – and support to the agricultural sector as a whole, such as the extension of rural development services, used to calculate the OECD General Services Support Estimate (GSSE). Section 3 summarises key trade policies relating to the agro-food sector. The chapter concludes with an estimation of support to the agricultural sector – namely producers, consumers, general services and the sector as a whole – and a summary of key findings.

2.2. Overview of agricultural policy framework

Key policy developments since the 1980s

In the 1980s and 1990s, Costa Rica undertook **major reforms** in the agricultural sector, moving from an import substitution regime to a trade liberalisation model. Trade policy reforms aimed to integrate the sector within international markets through active participation in multilateral, regional and bilateral trade negotiations and the attraction of Foreign Direct Investment (FDI) to strategic sectors. The main policy objectives in the agricultural and food sector at this time were to strengthen the agricultural export sector in terms of growth, diversification and sophistication of exports and destination markets (SEPSA-MAG, 2015), to increase the stability of trade flows through better and more transparent international trade rules (COMEX, 2015), and to ensure the quality and food safety of key imports through improved phytosanitary and sanitary controls (SEPSA-MAG, 2015) (For more details, see Annex 2.A1.A).

Import-substitution through high levels of protection for the domestic market and taxation of the agricultural sector was replaced in the 1980s by **open-market policies** and reduced state intervention. For the first time, the agricultural sector was exposed to significant competition, forcing it to use available resources more efficiently and to become more productive. The transition from a closed to an open economy forced adjustments in exchange and interest rates, tariffs, credit, tax and salary structures. Macroeconomic policies, in particular, influenced agricultural prices, production costs, and growth patterns, as well as the structure of the agricultural sector. The implementation of structural adjustment programmes saw the introduction of deregulation, privatisation, and the reduction both of trade barriers and of the budget deficit.

In undertaking this change in strategy, the government argued that for a small country like Costa Rica to realise its growth potential, it was necessary to develop strong links with international markets. However, this was hindered by the high tariffs and other obstacles to trade that were characteristic of the Central American Common Market at the time. To support the process of openness and greater integration with international markets, Costa Rica signed the Uruguay Round (GATT-UR) agreements, joined the World Trade Organization (WTO), negotiated and signed Free Trade Agreements bilaterally and with regional blocs, and participated both in the restructuring of the Central American Common Market and in negotiations to develop a customs union at the sub-regional level.

Institutional reforms of the Agricultural Public Sector (APS) were also implemented in the 1980s and 1990s in order to promote competitiveness. These included limiting the power and size of public institutions and strengthening mechanisms for private stakeholder participation. Incentive schemes, such as the Tax Credit Certificates-CAT and Free Zone

Regimes, were also developed in order to promote FDI. Other developments included the reduction of state monopolies on commodity imports and price deregulation for most domestic consumer goods.

As concerns emerged in the 1990s about the **sustainability of natural resources** and the environment, management of agri-environmental issues became a more prominent focus of policy. Formerly under the responsibility of the Ministry of Agriculture and Livestock, a new Ministry of Natural Resources, Energy and Mining (MIRENEN) – now the Ministry of Environment and Energy (MINAE) – was created. A range of policy instruments were developed to mitigate the negative impacts of agriculture on the environment; for instance, the Forestry Financing National Fund (FONAFIFO), which offers an ecosystem services payment to agricultural producers.

In the 1990s and the first half of the 2000s, the Costa Rican government continued to focus on export promotion. Following the food price crisis of 2007-08 and the concerns surrounding **food security**, national agricultural policy began to emphasise the domestic market and the strengthening of productivity. In 2010, specific strategies were developed for products that were considered to be important to the national diet. A value chain approach was taken for products like rice, beans, cocoa, onion, banana, pineapple, and milk products, and a programme to develop sustainable livestock production was introduced.

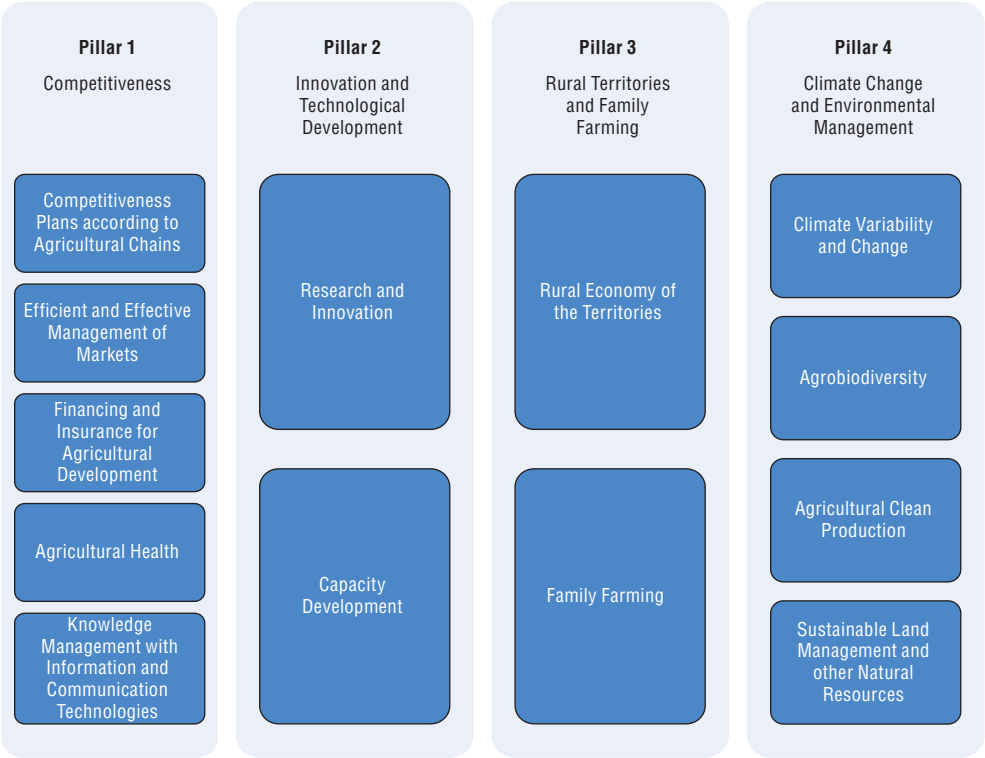
In 2014, in alignment with the national objective of poverty reduction, the focus of national agricultural policy broadened to include **the improvement of living conditions in rural areas**. The new approach attempts to address an important gap by going beyond the agricultural sector and integrating a range of sectors within a more holistic approach to rural development, with specific policies aimed at different stakeholder groups.[1] Policies were introduced to improve the living conditions of small-scale rural producers, family farming, and disadvantaged social groups in rural areas, as well as programmes to address the needs of women farmers and rural youth. Furthermore, the second agricultural objective of increasing agricultural value-added through **improvements in productivity** and sustainability was directed mostly towards small and medium-scale farms by means of the strengthened provision of services. Yield targets were also set for certain staple crops such as rice, beans, potatoes and milk.

Agricultural policy objectives

In order to define a **long-term agricultural and rural development strategy**, a process of consultation and consensus-building was carried out in 2010 amongst different stakeholders in the agricultural and rural sectors (government, producers, academia and social actors) (MAG, 2011). The result of this process was the "State Policy for Costa Rican Agri-food Sector and Rural Development 2010-2021" (*Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010-2021*). Under these new policy guidelines, the agricultural sector is positioned as the basis of inclusive, modern, competitive and environmentally-responsible development. The guidelines cover four main policy pillars: (i) competitiveness, (ii) innovation and technological development, (iii) rural area management and family farming, and (iv) climate change and agro-environmental management (Figure 2.1).

These guidelines, or policy framework, took into account Costa Rica's international, multilateral and regional commitments – under the WTO, UN or ILO, the Central American Agricultural Policy (PACA) and the Central American Strategy for Territorial Development (ECADERT), for example – to ensure the coherence of national policies with international obligations.

Figure 2.1. **State Policy for the Costa Rican Agri-food Sector and Rural Development 2010-2021**



Source: SEPSA (2015a), MAG (2011).

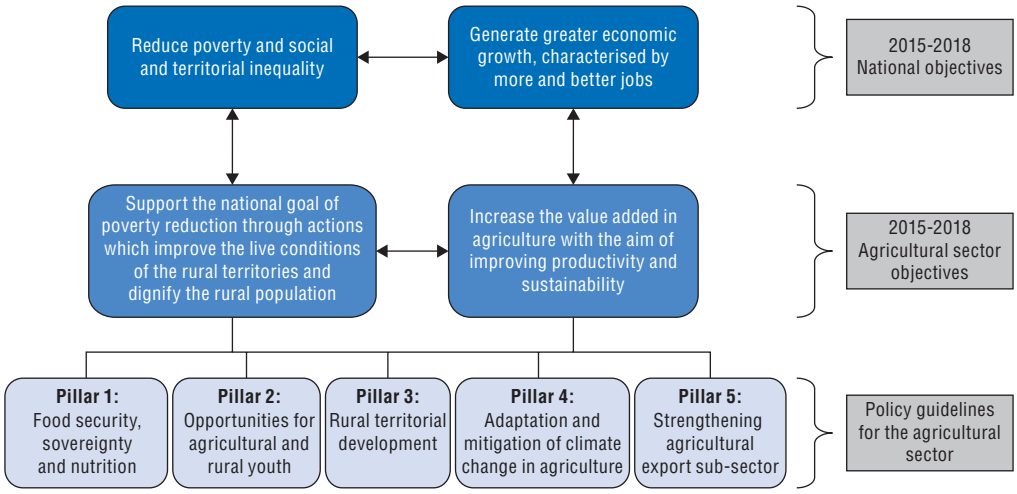
The current government (2014-18) has continued these long-term guidelines for the agricultural sector, but has redefined its **mid-term goals** in line with new priorities established within its National Development Plan "*Alberto Cañas Escalante*" (NDP) for the 2015-18 period. The NDP's main national goals are: a) reduction of poverty and social and territorial inequalities; and b) generation of greater economic growth, with more and better employment. The NDP also includes specific goals for different areas of the government at the sectoral level, including the specific plan for agriculture, the Agricultural and Rural Development Plan 2015-2018: *"Plan Sectorial de Desarrollo Agropecuario y Rural 2015-2018"*. This sectoral plan is part of the policy framework for the 2015-18 period (described below), and includes both specific goals[2] and a budget estimation of the costs of related policy instruments.

With a view to implementing the goals of the sectoral plan for agriculture, the government has introduced a policy framework for the 2015-18 period, "Policies for the Agricultural Sector and Rural Territorial Development 2015-2018" (*Políticas para el Sector Agropecuario y el Desarrollo de los Territorios Rurales, 2015-2018*). This framework sets two objectives for the agricultural sector: a) to support the national goal of reducing poverty through actions that improve living conditions in rural areas, and b) to increase the value-added in agriculture through improvements in productivity and rural sustainability (Laws No. 7064 and No. 9036).

These sectoral objectives are in turn captured by **five main policy guidelines (or "pillars")** for the agricultural sector (SEPSA, 2015a): a) food security, sovereignty[3] and nutrition; b) the creation of opportunities for agricultural and rural youth; c) rural territorial development;

d) adaptation to and mitigation of the effects of climate change on agriculture (MICCA); and e) the strengthening of the agricultural export sector. These five pillars are interconnected with the national objectives (Figure 2.2) set out in the NDP.

Figure 2.2. **Agricultural sector: Relationship between national and sectoral objectives and policies**



Source: SEPSA (2015a).

Each of the five pillars contains different strategic areas and actions.[4] A total of 184 different actions address the development and implementation of agricultural policies, making it difficult to evaluate and measure their effectiveness. Furthermore, many of these actions overlap not only within the Agricultural Public Sector (APS), but also within Ministry of Agriculture (MAG) itself, and with non-agricultural ministries and governmental institutions, all of which make for significant challenges in ensuring both effective implementation and policy coherence.

Institutional arrangements for agricultural policy management

The **Agricultural Public Sector (APS)**, established by Law MAG-7064 in 1987, is comprised of eleven institutions which fall under the responsibility of the Minister for Agriculture. One of these institutions is MAG, which is responsible for the management of the APS and the formulation and implementation of agricultural policies, in addition to the agricultural extension system.[5] The APS organisational chart can be found in Annex 2.A2.

Of the eleven institutions[6] in the APS, five are under the direct control of the MAG: the National Institute of Innovation and Transfer of Agricultural Technology (INTA)[7], the National Animal Health Service (SENASA), the State Phytosanitary Service (SFE), the National Seed Office (ONS) and the National Council Club 4-S (CONAC). These institutions receive financial resources from MAG. Only two have their own board of directors: ONS and INTA; the remaining three are managed directly by MAG.

The other five institutions of the APS are decentralised and have an important degree of political independence. These are: The Rural Development Institute (INDER), the National Production Council (CNP), the National Irrigation and Drainage Service (SENARA), the Comprehensive Agricultural Marketing Programme (PIMA) and the Costa Rican Fishing Institute (INCOPESCA). PIMA and INDER are financially independent from MAG, but the others may receive transfers from it.

In addition to these eleven institutions, the APS has five administrative and co-ordination bodies: the Executive Secretariat for Agricultural Sector Planning (SEPSA), the National Agricultural Council (CAN), the Agricultural Sectoral Technical Committee (COTECSA), and the working bodies for public-private dialogue and consultation for joint solutions: the Joint National Forum, the Joint Regional Forum, and the Regional Agricultural Sector Committees (CSRA) (Annex 2.A2). The most important of these bodies is the CAN, a consultative advisory and sectoral co-ordination body that introduces and approves the agricultural sectoral plan. CAN is chaired by the Minister for Agriculture and includes CEO-level representatives from relevant public sector institutions and banks[8].

The Minister for Agriculture also chairs the National Joint Private-Public Forum and the Regional Joint Private-Public Forum. These stakeholder bodies comprise representatives of small and medium-size agricultural producer organisations, and are aimed at funding joint public-private solutions and promoting greater participation and representation of producer organisations in policy making (SEPSA-MAG, 2015).[9] Details of each APS institution can be found in Annex 2.A2.

The **agricultural private sector** is comprised of a network of supply chain organisations. Some of these organisations are called "corporations" (*corporaciones*). The government is significantly involved in these bodies – all are governed by public law, and the Minister for Agriculture is a member of the Boards of Directors of four[10] of the six corporations. The corporations emerged as a result of the government's need for mechanisms for private sector participation in the execution of programmes – research and development partnerships in particular – and to streamline the provision of technical services and financial and marketing support to producers.

Key corporations are: ICAFE (coffee), LAICA (sugarcane), CORBANA (bananas and plantains), CORFOGA (livestock), CONARROZ (rice), and the National Horticultural Corporation (CHN, for horticulture) (Box 2.1). Corporations have an important role in negotiating policy and in the provision of services to agriculture, and some have also been responsible for the implementation of public agricultural policies (e.g. coffee programmes implemented by ICAFE). Although at the time of their creation, these organisations received some kind of government support, they are currently solely funded by their members.

Farmers can also belong to chambers or co-operatives. In contrast to the corporations, however, the government is not involved in the management of either of these bodies. Chambers can either represent specific sectors – e.g. pineapple production and export, represented by the National Chamber of Pineapple Producers and Exporters (CANAPEP) – or a broader set of stakeholders, such as the National Chamber of Agriculture and Agribusiness (CNAA), the Costa Rican Chamber Food Industry (CACIA), the Union of Small Scale Farmers (UPANACIONAL) and the National Farmers Organization (*Mesa Nacional Campesina*). Agriculture co-operatives have a strong tradition in Costa Rica, and include large-scale co-operatives such as Dos Pinos in the milk sector and Coopemontecillos for beef.

Although **agricultural supply chain organisations** wield significant influence in Costa Rica, less than 30% of all farmers belong to some type of agricultural organisation (Table 2.1). Of these, the majority are members of co-operatives (17.1 %), followed by associations or chambers (10%). Only 3% of farmers belong to some sort of farmer association. This again reflects the divergence between well-integrated value chains oriented to the export market, and less-organised traditional agriculture characterised by small and medium-scale farms that produce mostly for the domestic market. Policies to promote the organisation of smaller farmers and their integration into value chains could foster development of the sector.

Box. 2.1. **Main agricultural supply chain organisations in Costa Rica**

Sector corporations ("corporaciones"):

***National Rice Corporation* (CONARROZ):** Created under Law No. 8285 of 2002, CONARROZ protects and promotes domestic rice production. The objective of the corporation is to establish a system of relations between national rice producers and agribusiness. Among its functions are a) estimating the volume of paddy rice required to cover national monthly consumption and domestic production per crop in each region and communicating this information to the Ministry of Agriculture and Livestock and the Ministry of Economy and b) proposing prices for paddy rice and by-products, and participating in the import and marketing of quality agricultural inputs to ensure competitive prices for the producer. CONARROZ is financed by a 1.5% levy on the price of paddy or milled rice, set by the Ministry of Economy, of which 0.75% goes to the producer and 0.75% to the industry; and 1.5% of the Cost, Insurance and Freight (CIF) value of imported rice. Other sources of funding are the Selling Services Fund, fines, profits, and investment returns. CONARROZ invests 25% of its total revenues in research and extension.

***Costa Rica Coffee Institute* (ICAFE):** ICAFE was established in 1933 in order to promote coffee production. By enforcing Law No. 2762, ICAFE promotes an ethical and unique production model for national coffee growers, millers, roasters and exporters, and supports national coffee production and milling. As well as national and international coffee marketing, the institute promotes the domestic and international consumption of Costa Rican coffee, researches and develops farming and industrial technology, and sets a fair and ethical reference price for Costa Rican coffee based on international market prices.

***National Banana Corporation* (CORBANA):** CORBANA was created in 1971 under Law No. 4895. This corporation is funded by a levy charged to its members for each kilo of bananas sold on the international market. With this levy, CORBANA develops research programmes to improve the quality of banana plantations, and provides technology transfer to producers, in addition to marketing, packaging, extension and other services. Credit is also provided to farmers affected by natural disasters in the Caribbean region. A small proportion of this levy is given back to banana communities for public infrastructure, mostly roads.

***Agricultural Industrial League of Sugarcane* (LAICA):** Created by Law No. 3579 of 1965, the purpose of LAICA is to organise, promote, protect and defend the interests of the Costa Rican sugar sector, to procure an equitable system of relations, and to ensure the optimum development and stability of the sector. It also commercialises alcohol, sugar, honey and other sugarcane products. The Minister for Agriculture and the Minister for Industry and Trade are members of the Board of Directors.

***Livestock Development Corporation* (CORFOGA):** CORFOGA, which was created by Law No. 7837 of 1998, aims to encourage the development and modernisation of the bovine livestock sector, and to increase its productivity through the rational and sustainable use of resources. CORFOGA participates, together with the Ministry of Agriculture, in the development and implementation of policies, plans, programmes and projects to promote the bovine livestock sector. The corporation receives tax revenues of up to USD 3 for each animal killed or for the export of live animals, as well as per 200 kg of livestock imports. CORFOGA is also authorised to receive state donations of goods and services. The Board of Directors of CORFOGA is formed by six livestock producers, the minister or vice-minister of Agriculture, the representative of the largest slaughterhouse for domestic consumption and a representative of the Livestock Industry Association.

***National Horticultural Corporation* (CHN):** The horticultural producers' organisation, created in 1996 under Law No. 7628, seeks the equitable development of production, manufacturing and marketing in the horticultural sector. This corporation provides technical and financial assistance to producers.

Sector chambers (cámaras):

National Chamber of Pineapple Producers and Exporters (CANAPEP): CANAPEP is a non-profit private organisation legally formed in 2003 to represent pineapple producers and exporters from across the country. Its objective is to position Costa Rica as the best pineapple supplier in the international market through

Box. 2.1. **Main agricultural supply chain organisations in Costa Rica** *(cont.)*

differentiated quality and the use of the most modern and best practices in agro-industrial production. Resources to finance its activities are obtained through membership fees.

Sugar Cane Chamber: This chamber represents the 13 sugar mills in operation in Costa Rica. Founded in 1949 in order to promote both the industry and good relations among cane growers, the chamber recommends measures to improve their workers' welfare, and promotes initiatives that contribute to the sector's development.

National Chamber of Palm Producers (CANAPALMA): Created in 1991 as a private, non-profit organisation, this chamber is the official spokesperson to various bodies, chambers and the government, with the objective of maximising productivity, reducing costs, transferring technology, and promoting sector competitiveness. The chamber unites 1 700 producers and is financed by affiliate contributions. CANAPALMA represents independent producers of oil palm, the producer organisation ASOPRO, and some co-operatives. It also co-ordinates efforts with the SFE on plant health issues (pest control problems). CANAPALMA promotes good agricultural practices among its members, and provides price information to its membership. Its board of directors is composed of seven industry representatives, a legal or treasury official, and an executive director, who are appointed for two years by the assembly of representatives. The chamber is based in Puntarenas Province.

National Chamber of Milk Producers (PROLECHE): Founded in 1965 as a trade union organisation for the improvement of national dairy activity, PROLECHE promotes the genetic improvement of livestock, and participates in analysis, discussions and decisions on dairy sector policies, and in negotiations of Free Trade Agreements. The chamber – which currently comprises more than 500 dairy producers, including industrial producers and co-operatives – collects, processes and analyses market information to ensure greater market transparency, and monitors the performance of prices of inputs for milk production. Among its most important projects are the creation of the National Network of Forages, the breeding and selection of herds project, the development of new value-added products, and the promotion of domestic consumption through the "*Si a la leche*" campaign. The chamber is an active member of the Central American Dairy Sector Federation (FECALAC) and the Pan-american Dairy Federation (FEPALE).

Costa Rican Chamber of Pork Producers (CAPORC): CAPORC, which represents pork producers, is a non-profit chamber founded in 1991 to promote and develop national pig production. CAPORC represents all producers in the country (small and large-scale) and serves as the interlocutor between producers and the government. CAPORC has participated in the construction of national legislation and negotiation of Free Trade Agreements (FTAs). The chamber represents 75% of national production, concentrated in 80 producers, but also operates programmes to promote and improve pig production amongst small and medium-scale producers. It is governed by a 12-member board of directors.

National Chamber of Poultry Producers (CANAVI): CANAVI represents the interests of poultry producers, in addition to researching and implementing measures to solve technical, economic and social problems related to poultry production and distribution. The chamber is a private, non-profit organisation, and participates in the development of policies that impact the sector. CANAVI has more than 350 partners, including producers of chicken meat, egg incubators, and producers of animal feed and other inputs. Of these 350 partners, CANAVI represents around 250 chicken producers with contract farming schemes with the processing industry. In total, CANAVI brings together companies representing approximately 90% of poultry meat production, and farm groups representing 65% of national egg production.

National Chamber of Coffee: This chamber aims to protect the interests of the coffee milling sector. Members are provided with technical information on issues that could affect their performance. The chamber is represented within ICAFE, as well as in other national associations managing private sector interests, and in government committees that work towards achieving environmentally sustainable production. 33 coffee millers are members of one of two sub-chambers: The National Coffee Exporters Chamber and the National Coffee Growers Chamber.

Box. 2.1. **Main agricultural supply chain organisations in Costa Rica** *(cont.)*

Chamber of Flower and Foliage Growers: This chamber, the main representative organisation for producers and exporters of flowers and foliage, represents the sector at international trade fairs, unites efforts to access new markets, establishes quality standards, defends the interests of the industry with regard to pricing and market issues, and positions products in international markets. It is a private non-profit organisation.

Umbrella associations:

National Chamber of Agriculture and Agribusiness (CNAA) *(Camara Nacional de Agricultura y Agroindustria)*: CNAA is a non-profit organisation – created in 1946 under Law No. 20312 – which brings together producers, entrepreneurs and other entities of the agricultural, fisheries, aquaculture and agro-industrial sectors. The chamber is an umbrella organisation that currently brings together 65 partners representing all sub-sectors, grouped into 12 sub-groups: vegetables, grains, livestock, coffee, bananas and sugar cane, fisheries and aquaculture, fruits, beans, ornamental plants, and agribusiness.

Union of Small-scale Farmers (UPANACIONAL): UPANACIONAL is a national small-scale farmers' union, founded in 1981, which comprises smallholder farmers from different sub-sectors. The union aims to improve the living conditions of its members by providing services, protecting farmers' rights, seeking favourable legislation, and pursuing better producer prices for its members, amongst other activities.

National Farmers Organisation (*Mesa Nacional Campesina*): Together with UPANACIONAL, this organisation seeks to defend the interests and rights of farmers in the smallholder sector. It aims to strengthen the position of small-scale farmers by political union representation, constitutional and organisational co-ordination and management, and the implementation of development projects that target smallholder families.

Costa Rican Chamber for the Food Industry (CACIA): CACIA is an entrepreneurial non-profit organisation created in 1973. This chamber is organised by producers and processors from the agro-food industry.

Co-operatives:

The co-operative movement has a long tradition in Costa Rica, particularly within the agricultural sector. There are total of 101 co-operatives, 24% in coffee and 15% in sugar cane. These bodies usually handle the processing segment of the value chain and, in some cases, the distribution. Most provide services to producers such as credit and technical assistance. The two largest co-operatives are **Dos Pinos** (milk) and **Coopemontecillos** (beef).

Source: SEPSA (2015b).

Table 2.1. **Farmer membership of agricultural organisations, 2014**

Type of organisation	Number of farmers	Percentage of farmers
Corporations and chambers[1]	9 210	10%
Co-operatives[2]	15 905	17%
Umbrella associations	2 848	3%
Not belonging to any organisation	65 582	70%
Total	93 545	100%

Note: Individual farmers can belong to multiple organisations.
1. Including all organisations that either aim at the marketing and commercialisation of agricultural products, or advise producers on these issues.
2. Defined by Law No. 4179 de *Asociaciones Cooperativas*.
Source: INEC-Agricultural Census (2014).

Some farmer organisations like corporations have had positive impacts on the development of the supply chain – such as in the coffee and banana sectors – particularly with regard to provision of research, technical assistance and extension services, and product marketing. However, other corporations, which also provide services to their farmers, have contributed to concentrated market structures and limited **competition**. This is the case, for

example, in the sugar and rice sectors. According to Law 7818, LAICA, the sugar producer association, can regulate all activities involved in the supply chain, from the purchase, import, export, storage to the commercialisation at retail level of sugar in Costa Rica (Annex 2.A5). The same situation is observed in the rice sector: CONARROZ (Law 8285) fully controls the rice market (Section 2.3). This lack of competition impedes the competitiveness of the sectors and reduces opportunities for smallholder producers.

Challenges facing the Agricultural Public Sector

The agricultural sector is subject to a highly complex **legal system**, with several hundred laws and ministerial decrees. The legal framework governing agriculture can be divided into three levels. First, there are national economic rules that have a free market orientation. A second group of legislative instruments includes those relating to social security, labour insurance, environmental issues, competition policies, and land taxation, which also influence the formal agricultural and agro-industrial sectors. Finally, sectoral legislation includes several outdated laws created in the 1950s. The result of this complex system is onerous bureaucratic requirements which seriously affect institutional efficiency and capacity.

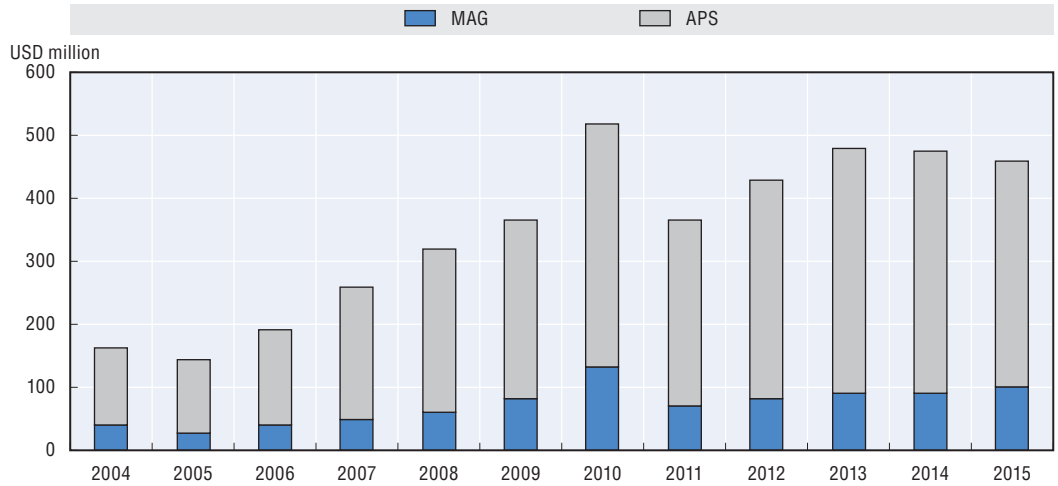
Under law 7064 (FODEA) in Title II, the APS is created as a forum for the management, planning, co-ordination, implementation, monitoring and evaluation of public activities in support of national agricultural development. This sector is managed and co-ordinated by the Minister of Agriculture, in his/her dual role as Minister of MAG and Chief of the APS. However, the Minister, as Chief of the APS, faces a number of obstacles in the co-ordination of the activities of the various APS institutions. First, the connection between the Minister and the 17 APS institutions (11 public, 4 corporations and 2 specialised offices), is both complex and weak, limiting the alignment of actions, guidelines and even policy objectives. In some cases, this is also leading to duplication and increased transaction costs – for export health certificates (EHC) or the registration of agrochemicals, for example (Chapter 1). Second, despite the participation of the Minister – or his/her representative – on the boards of the APS institutions, the Minister's powers over these bodies are actually quite limited. Some of the decentralised institutions are financed directly from the national budget through transfers from MAG, which promotes sector co-ordination. However, specific laws for each institution and the presence of boards, which grant them a level of functional independence, limit the influence of the Minister. In addition, some institutions generate their own resources by selling services, which gives them additional autonomy.

In addition to the Minister of MAG, only one co-ordinating body exists for the manifold APS agencies: the CAN, whose decisions are binding on all public sector institutions, and which brings together the leaders of all sector institutions. Results from discussions in this group vary, however – some actions are co-ordinated across groups, while others reflect the specific interests of each agency leader. Since 2014, efforts have been made to reactivate CAN, with the aim of improving co-ordination both within the APS and across other institutions and ministries. Overall, however, the complex organisational structure of the sector, with its fragmented authority and dispersed responsibility, coupled with the rigidities from institutional mandates created by law, poses challenges for co-ordinated action and the implementation of policies and reforms.

The APS budget increased over the 2004 to 2015 period (Figure 2.3). In 2010, resources increased markedly, as consequence of the implementation of the National Food Plan (2008-10), but returned to prior levels the following year, then subsequently increased, with

a slight decline after 2013 reflecting fiscal tightening. As a share of **public expenditure**, however, outlays to the APS sector have stayed relatively steady, at around 1.1%, on average, of the national budget allocation over the past nine years (Contraloria General, 2016). Three APS institutions – MAG, INDER and CNP – receive the largest portion of budget funds, at approximately 75% of the overall APS budget in 2010-15. Budget management is complicated, given the different levels of financial and administrative autonomy of each agency and the different funding sources. Some agencies are funded by the federal government, others through their own resources, and others through a combination of both. Still other agencies are directly funded by state enterprises, as is the case of FANAL (a state-owned enterprise that produces alcoholic beverages), which finances CNP's programmes.

Figure 2.3. **Evolution of the Agricultural Public Sector (APS) and MAG budgets**



Source: SEPSA (2016b).

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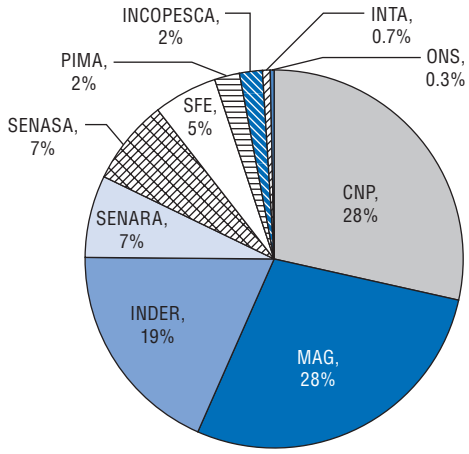
Over the past ten years, MAG has continued to receive, on average, 26% of the total APS budget, CNP around 30%, and INDER around 20%. This trend has not changed. Only a small allocation within the budgetary distribution is devoted to agricultural innovation systems, technology transfer and technical assistance programmes (under INTA), while resources for agricultural infrastructure, market information systems and a strategic information system for the sector are very limited (efforts such as the market information system, InfoAgro, have limited reach). Lastly, it should be noted that several decentralised institutions – such as INCOPESCA and PIMA – obtain resources from the services they provide, and as such are not solely reliant on the public budget. The budget displayed in Figure 2.4 includes both public income and income derived from charges, which represent, on average, around 11% of total income (SEPSA, 2016a).

The allocation of resources within MAG has been relatively constant over the past six years. A significant share of MAG's resources (55%) is transferred to other APS institutions, mainly to cover their overhead costs. Around 13% is allocated to MAG's administrative costs. Agricultural extension also receives a substantial share of the budget, at around 24%. Farmer subsidies receive limited and variable allocations from MAG, although there are other institutions that provide relatively minor subsidies to farmers (Section 2.5). The total budget for the Ministry in 2015 was almost CRC 53 billion (USD 99 million) (SEPSA, 2016a) (Table 2.2).

Figure 2.4. **Share of APS budget by institution, 2015**



Source: SEPSA (2016a).

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Table 2.2. **MAG budget (in million current CRC)**

Activities	2010	2011	2012	2013	2014	2015
MAG's overhead/administrative cost, salaries, etc.	4 084 (10%)	4 440 (13%)	4 341 (11%)	4 877 (11%)	8 490 (18%)	8 505 (16%)
Transfers to other APS institutions to cover overhead/ administrative costs, membership costs, etc.	22 037 (54%)	17 283 (52%)	24 011 (60%)	25 740 (58%)	24 184 (51%)	28 783 (55%)
Agricultural extension system	9 050 (22%)	9 524 (29%)	9 351 (23%)	10 443 (23%)	11 055 (23%)	11 722 (22%)
SEPSA	702 (2%)	770 (2%)	836 (2%)	870 (2%)	930 (2%)	1 012 (2%)
Some support programmes to farmers	4 985 (12%)	1 348 (4%)	1 415 (4%)	2 593 (6%)	2 794 (6%)	2 644 (5%)
Total	40 858	33 365	39 954	44 523	47 454	52 665

Source: SEPSA (2016a).

Budget execution rates, from approved and assigned budgets, average 80% across all APS institutions, with low levels of execution by some institutions (some as low as 50%) constraining the implementation of some policies (SEPSA, 2016a). The problem of budget execution often relates to the timeframe for national budget planning and the late arrival of resources to the institutions. Furthermore, implementation of some programmes is hampered by weak co-ordination – referred to earlier – and heavy bureaucracy between public agencies. As a consequence, several programmes are not implemented on time or at all (e.g. some INDER programmes), and services provided to farmers are limited and not always timely. Moreover, Costa Rica's fiscal tightening since 2013 has further limited investment in the agricultural sector, including in research projects, innovation and technology transfer. Additionally, there is no systematic impact assessment and evaluation of public expenditures on agriculture.

Finally, MAG and some of its attached institutions suffer from a growing **deficit in technical capacity**, related in particular to the age of most of its employees – 32% of staff are eligible for retirement in the next three years – and the non-renewal of technical positions: only one new hire is permitted for every seven retirees. The inclusion of numerous administrative tasks within the responsibilities of technical personnel also limits the effectiveness of service provision, as extension staff time is often diverted away from core advisory tasks. Extension services also suffer from limited co-ordination between research and development (R&D), knowledge generation and farmers' needs (SEPSA, 2016a).

2.3. Domestic policies

This section discusses domestic policy measures that provide support to agriculture. First, policies that provide direct transfers to farmers – such as price support, input support or direct payments – are considered, after which other policies that provide support to the agricultural sector as a whole are explored, such as extension services or rural development.

Price support measures

Although the majority of agricultural products do not receive price support, Costa Rica has maintained an administered **minimum price for rice** for decades. Reforms to the minimum price took place in 2015, when it became a *reference* minimum price; however, in reality, the reference price continues to function as a minimum price – although it should be noted that the reforms are still relatively recent. This minimum reference price is based on an analysis of domestic production costs carried out by the National Rice Corporation (CONAROZ) (Box 2.2). Rice is the most important staple food in the country, with an annual consumption of more than 50 kg per capita. Costa Rica currently produces around 60% of its national consumption and imports 40%, in volume terms (MAG, 2015).

Box 2.2. **Minimum reference price for rice**

Prior to 2015, the price for rice was fixed by the Ministry of Economy, Industry and Commerce (MEIC), based on a recommendation from CONARROZ, the rice farmer association. The price was established for producers, wholesalers and retailers, based on domestic production costs.

On February 27, 2015, this system of administered rice prices was converted into a minimum reference price through Executive Decree No. 38884-MEIC, and the WTO Committee on Agriculture (G/AG/GEN/126) was notified by the Ministry of Foreign Trade (COMEX) of these changes on May 26th the same year. The new minimum reference price for producers was CRC 22 139 for a 73.6 kilo bag of rice with 13% of humidity and 1.5% of impurities. The minimum reference price, which is calculated according to a new – and reportedly more transparent – method to determine prices for the entire supply chain (Table 2.3), is intended to be an indicative value that serves as a baseline for the subsequent negotiation of a contractual price between rice producers and processors, based on their own marketing conditions (place of delivery, payment and grain quality). As the reference price does not have the compulsory connotation of the previous scheme, the amendment implies an eventual dismantling of the domestic support mechanism for producers. That said, no removal deadline is envisaged for the reference price.

Table 2.3. **How rice prices are estimated**

Reference	Percentage of whole grain	Formula
A	50% to 89% whole grain	[%E * (2 VQ) + %Q (VQ)] * U
B	90% to 94% whole grain	[%E * (2.25 VQ) + %Q (VQ)] * U
C	95% to 100% whole grain	[%E * (2.50 VQ) + %Q (VQ)] * U

Where:
%E = Percentage of whole grain.
%Q = Percentage of broken grain.
VQ = Value of broken grain. Based on costs of the industrial sector, the broken grains value (VQ) is set to CRC 311.9626 per kilo for the 24 kg bag; and CRC 307.9297 per kg for 46 kg bag.
U = Profit margin. To calculate the price from the industry to the wholesale, the value of "U" is equal 1 as VQ already includes the profit. To calculate wholesale prices, the value of "U" is equal to 1.05 (5% profit margin). For the retail price the value of "U" is 1.1235 (7% of the retailer margin plus 5% of the wholesale margin, which is obtained by multiplying 1.07 and 1.05).

Source: MEIC (2015).

http://www.conarroz.com/UserFiles/File/DECRETO_PRECIO_ARROZ_N_38884_MEIC_alca12_27_02_2015.pdf.

The rice supply chain is co-ordinated by CONARROZ, which informs MAG when it is necessary to import rice to cover deficits arising from national demand, and supervises the distribution of import volumes between the rice industries in proportion to their participation in the domestic market. Import tariffs are also imposed on rice, at 36% in 2015 (COMEX, 2016c). Lastly, when technical studies indicate a surplus, CNP or CONARROZ are permitted to export rice, but this rarely occurs. After the food price crisis of 2007-08, the government implemented a set of policies[11] that promoted staple food production, including rice; as a consequence, the number of commercial rice producers increased, from around 900 in 2007 to 1 500 in 2011. The land devoted to rice production also increased over the same period, from 47 000 hectares to 81 000 hectares. However, these policies were dismantled over 2011-12 and, by 2015, both the number of rice producers and the hectares had fallen to almost 2007 levels (938 producers and 58 000 hectares in 2015) (CONARROZ, 2008-15).

Costa Rica has one of the highest domestic rice prices in the world. According to the FAO Rice Market Monitor (2013), the average consumer price was the highest of 46 analysed countries. Consumers, particularly those with fewer resources, which include small-scale rice farmers, allocate a significant portion of their income to purchase this staple at a price higher than the international market price (Umaña, 2011; Hidalgo, 2014). Furthermore, beneficiaries tend to be a dwindling number of farmers and rice millers. This strongly indicates that the intended policy objectives of food security and improvement of the living conditions of the poorest are *not* being served by this policy.

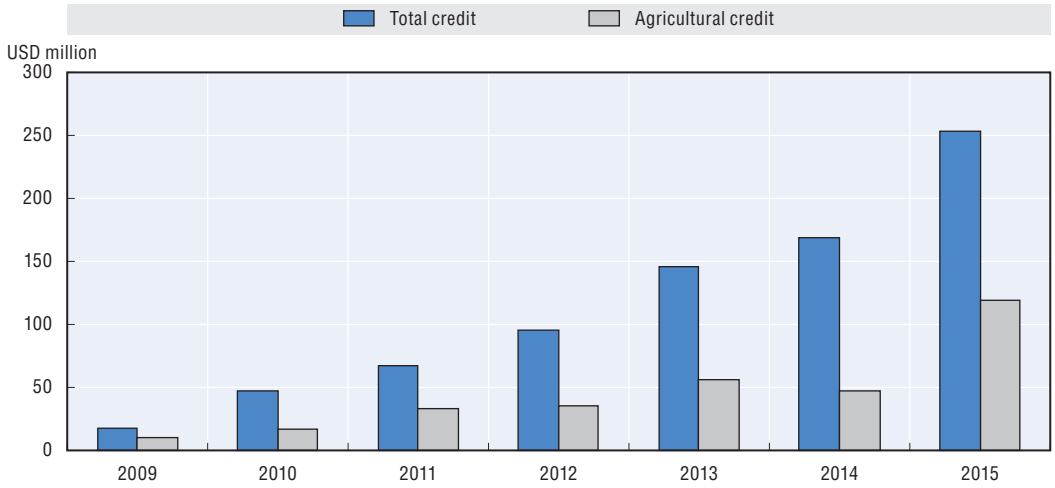
Input support measures

Costa Rica provides limited input subsidies. There are some minor implicit credit subsidies, derived from preferential interest rates, delivered through the Development Bank System (SBD), INDER and ICAFE, and minor implicit insurance subsidies provided to producers by the National Insurance Institute (INS). Other subsidies are directed to fixed capital formation and on-farm services.

Agricultural credit represents only 2.5% of total loans provided though public or private banks in Costa Rica (SEPSA, 2015b). Around 14% of all farmers receive credit or financial services (INEC-Censo agropecuario, 2014). Agricultural producers in general have limited access to financial services due to stringent requirements, and are underserved by the commercial sector. This problem has been addressed to some extent by the creation of the SBD,[12] a second-tier bank that provides funds to first-tier banks like *Bancrédito*, created in 2008 (under Laws No. 8634 and No. 9274) to channel financial resources to micro, small, and medium-scale enterprises from all sectors, agriculture included. In 2015, 47% of total loans allocated through SBD were provided to the agricultural sector. SBD provides different types of credit to farmers, including working capital and loans for marketing and investment or the acquisition of machinery and equipment. As SBD provides loans at preferential (below market) interest rates, an implicit subsidy is provided to farmers under this system, estimated at USD 3 million in 2015.

SBD allocations increased more than tenfold between 2009 (the first year of operation) and 2015, reaching over CRC 135 billion (USD 253 million) in 2015 (Banca de Desarrollo, 2016) (Figure 2.5). However, a rough estimation[13] from SBD on the potential credit need for the agricultural sector could reach as high as around CRC 850 billion (USD 1.6 billion). With the reach of the SBD limited and private commercial banks continuing to have minimal involvement, agricultural credit remains insufficient.

Figure 2.5. **Evolution of credit allocations by SBD, 2009-15**



Source: Banca de Desarrollo (2016)

StatLink http://dx.doi.org/10.1787/888933451778

Other relatively minor credit sources are INDER (created under Law No. 9036) and a Trust Fund (Law 9153) destined for coffee growers. INDER provides credit to small-scale farmers at preferential interest rates. The credit must be used on land acquisition or the development of productive projects in rural areas. In 2015, the implicit subsidy was around USD 45 000. In 2005 and 2012, INDER implemented debt write-offs – this cancelled debt amounted to a USD 3 million subsidy (Law 8434 and 9037). The trust fund provides credit to small-scale coffee producers for the renewal of coffee plantations and for the improvement of productive systems. In 2015, the subsidy from this trust fund was around USD 1.1 million.

Agricultural insurance is not widely present in Costa Rica. In 2015, insured land represented only 1.25% of the total agricultural area. Indeed, the only provider of agricultural insurance is the INS, a former public insurance company (INS, 2015). Historically, INS provided crop insurance to protect rice farmers – and, to a lesser degree, bean producers – against climate and biological hazards. Although there were no subsidies for premiums, INS was prevented by law from making profits from the sale of agricultural insurance, resulting in an implicit subsidy reflected in cheaper insurance rates for producers (Law No. 4461) (INS, 2015; INS 2016). The value of the implicit subsidy for 2015 was USD 58 000. The restriction of profit-making by the INS has now been abolished, however. Moreover, in 2015, a new programme called "Comprehensive Crop Insurance" was created by INS and MAG to promote the use of insurance among agricultural producers. This programme aims to identify agricultural practices that reduce the negative impacts of extreme weather events. The programme will cover coffee, sugar cane, potatoes, pineapple, cattle, poultry, pigs, vegetables (onions, cabbage, broccoli and carrots) and rice farms, and will introduce some premium subsidies (more details can be found in Chapter 3).

Costa Rica is working towards a **risk management** approach, though agricultural insurance is still in the early stages of development. In line with the "National Risk Management Policy 2016-2030", the National Commission of Risk Prevention and Emergency Response (CNE) works closely with the agricultural sector to assess current risks, reduce risk exposure, and prepare for emergency response. Such efforts include monitoring of weather phenomena in high-risk areas and management of a public online portal to bring together data generated by universities and research centres. CNE also operates an early warning

system with support from active community participation (Sancho, 2016). Moreover, in the event of a disaster, CNE provides some financial support to farmers; this includes access to financing (or extended loan periods) and provision of inputs, machinery and emergency cash payments. At the same time, agricultural insurance markets are underdeveloped in Costa Rica. For several decades, crop insurance was provided almost exclusively by INS – the former state insurance institution – to rice producers. In 2015, INS initiated efforts to expand its coverage, with a crop insurance product for several of Costa Rica's main crops. Currently, only 1.3% of agricultural land is insured, but plans for expansion are under development.

Few **subsidies for fixed capital formation** are provided to farmers. A production diversification programme managed by MAG is only implemented in the Sixaola area, and provides subsidies for the purchase of machinery or equipment, with the aim of diversifying the production portfolio of small farms and promoting other sources of employment. Other transfers managed by MAG are also provided to farmers for investment in production projects. Farmers must contribute to the total cost of the project, and have to present a satisfactory project proposal in order to obtain the subsidy. Another programme managed by INDER provides subsidies for fixed capital formation to poor smallholders for the creation of auto-consumption production modules. SENARA meanwhile finances on-farm irrigation investments through the Irrigation of Small Areas programme (PARD). For small-scale and poor farmers, SENARA pays the total cost of the investment. For medium and large farms, SENARA makes a partial contribution. All of these programmes together amounted to USD 12 million in 2015 (SEPSA, 2016b).

Direct payment for environmental services

There are also several **direct payments for environmental services**, with four programmes currently administered by different institutions. The first, the Recognition of Environmental Benefits for Organic Production (RBAO), is a direct payment to organic producers for a maximum period of three years. It consists of a base amount per year per producer, as determined by a technical unit and formalised by an agreement between MAG and the organic producer. This programme, based on Law No. 8591 on the Development, Promotion and Development of Organic Farming Activity, is funded by 0.1% of revenues from a fuel tax. Transfers from this programme were USD 86 000 in 2015.

MAG also manages a small fund for the "Programme of recognition of environmental benefits" (*Programa de reconocimiento de beneficios ambientales*), for the use of "green or living" fences and terraces, and soil condition improvement. Individual small and medium-scale producers can receive approximately USD 100 each year, over three years. The subsidy under this programme amounted to USD 258 000 in 2015.

The Costa Rican Electricity Institute (ICE), a government-run electricity and telecommunications institution, provides electricity supplies and materials through the Basin Management Programme to farmers that develop activities and projects that ensure the sustainable use of natural, social and economic resources under an integrated and participatory approach. The programme (ICE-Basin) also includes training services, such as technical assistance, environmental education and outreach events. In 2015, the outlays for the Basin Management Programme totalled USD 368 000.

The National Forestry Financing Fund (FONAFIFO, Law No. 7575), implemented by the Ministry of Environment and Energy (MINAE), promotes forest environmental services, and has played an important role in the recovery of the country's forest area. FONAFIFO finances the programme (PSA) that provides financial recognition to farmers for environmental

services – both environmental protection and improvement. The following environmental services are recognised: a) the mitigation of greenhouse gas emissions (fixation, reduction, sequestration, storage and absorption); b) the protection of water for urban, rural or hydroelectric use; c) the protection of biodiversity for the conservation of ecosystems and new life-forms; d) the protection of natural scenic beauty for tourism and scientific purposes; and e) scientific, genetic improvement, research and sustainable use of pharmaceuticals. The budget is limited, however. In 2015, outlays for environmental services programmes (i.e. RBAO, ICE-Basin and FONAFIFO) in Costa Rica were equivalent to USD 1.2 million (SEPSA, 2016b).

Environmental measures

In addition to the above, MINAE manages four agendas related to environmental management: 1) the Coffee Agenda, which aims to promote environmental management in various economic sectors of the country – that is, to promote evaluation, measurement and monitoring through mechanisms and regulations which ensure that activities and projects are part of an overall vision of sustainable development; 2) the Energy Agenda, which seeks the rational and efficient use of energy resources; 3) the Green Agenda, which seeks to strengthen processes, programmes and projects on the conservation and sustainable use of terrestrial biodiversity; and 4) the Blue Agenda, which seeks to organise and promote appropriate government responses to maritime and coastal development problems (including the valuable wetlands), in order to protect and sustainably manage the country's coastal marine resources. Details of environmental policies concerning agriculture can be found in Chapter 3.

General services provision

A significant share of public expenditure in the agricultural sector is directed to general services. At around 80% in 2015, this is double the OECD average (more details in Section 2.5). Outlays are allocated to extension services (MAG), agricultural research and development (INTA), irrigation investments (SENARA), animal and plant health (SENASA and SFE), rural development projects (INDER), marketing and promotion (CNP) and market information (CNP and InfoAgro). Extension services, development and the maintenance of irrigation infrastructure, rural development and inspection and control, are the main forms of support provided to general services.

Research and development and extension services

Agricultural **research and development** (R&D) is governed by the National Institute for the Innovation and Transfer of Agricultural Technology (INTA), which was created by Law No. 8149 in 2001. In addition to managing the agricultural R&D and innovation system, INTA operates programmes for technology transfer and extension services, all with the objective of improving productivity while ensuring sustainable agricultural production. INTA establishes its R&D and technology transfer programmes based on the priorities of the long-term strategic agricultural plan 2010-21 (Section 2.2). In 2015, INTA's budget spend was around USD 6.5 million (INTA, 2016).

INTA's budget currently represents only 1% of the total budget allocated to the agricultural sector (APS) (SEPSA, 2015b). INTA resources have varied over the years, as an important part of funding comes from contributions from other APS institutions (e.g. SFE, MAG, etc.). INTA has 197 employees, including researchers, but only 157 are currently working in INTA itself,

as the rest have been moved to other institutions within the APS (e.g. 24 are working within MAG). Around 65% of INTA's employees are older than 50 years, and by 2020, more than 50% will have retired (SEPSA, 2014). However, INTA does not have a generational replacement plan and, like other public institutions, is prevented from hiring more people by Article 12 of Presidential Directive 023-H, which aims to reduce the size of government. INTA also faces some regulatory issues regarding the training of its researchers, and requires additional investment in its limited physical facilities – offices, laboratories and experimental campuses, for example (INTA, 2016).

It should be noted, however, that several agricultural supply chain corporations (Section 2.2) operate their own research and technology transfer programmes, such as CONARROZ, ICAFE and CORBANA. In addition, SENARA carries out research, control and monitoring of water resources, and provides basic guidance for studies on water resources throughout the country (SEPSA, 2016b).

Agricultural extension services fall within the competence of MAG. The extension services programme, created in 1979 under Law No. 7064, promotes the development of processes for the transfer and adoption of sustainable and environmentally-friendly technology, as well as business management for agricultural value chains, with the objective of boosting competitiveness and sustainability, while generating value added, fair trade and the rational use of natural resources. The provision of these services does not involve direct payments to producers or processors. It conforms to government programmes that provide services such as general and specialised training, and includes extension and advisory services that facilitate the transfer of information and research results to producers (MAG, 2016).

The extension service has 468 employees distributed across the country. In 2015, around 22% of MAG's budget (USD 21.5 million) was spent on extension services (SEPSA, 2016b). However, even though extension services are a key area of MAG responsibility, the effectiveness of these services is questionable. Extension services suffer from the fact that the time of many of its workers is absorbed by servicing administrative requirements rather than providing core extension activities. Furthermore, as noted above, the system lacks staff that are well-trained in new issues and – notwithstanding the fact that 32% of its staff is eligible to retire in the next three years – faces restrictions on the renewal of technical positions. Extension therefore faces challenges with maintaining technical capacity. Extension services also suffer from limited co-ordination regarding R&D responsibilities, particularly with those of the INTA (MAG, 2016).

Animal and plant health and quality and sanitary control

The **National Phytosanitary Service** (SFE) was created under Law 7664 in 1997, in order to prevent plant pests that could threat national production. SFE responsibilities include: 1) monitoring and controlling pests of economic importance and foreign pests which may pose a potential threat to domestic agricultural production; 2) promoting an integrated pest management system within a sustainable development approach; 3) regulating, monitoring and controlling chemical and biological substances for agricultural use, such as pesticides and fertilisers; and 4) controlling the maximum permitted residue levels (MRLs) of pesticides in fresh products. Furthermore, the SFE controls and certifies imports and exports of agricultural products in order to prevent phytosanitary measures from constituting unnecessary obstacles to international trade. Several services by SFE are paid for by farmers. Services provided free of charge to the sector in 2015 were equivalent to USD 6.6 million (SFE, 2016).

Animal health is supervised by the National Animal Health Service (SENASA), which was created in 2006 under Law 8495. SENASA is responsible for ensuring the safety of food of animal origin. It also registers, regulates and supervises veterinary medicines and animal feed. Additional responsibilities include animal quarantine, traceability, laboratories and veterinary services. As in the case of SFE, most of the services provided by SENASA are financed by farmers – however, free of charge services totalled USD 7.4 million in 2014 (SENASA, 2016). The main bottlenecks for SENASA are its limited infrastructure (i.e. laboratories) and human resources. For instance, around 20% of its workers are older than 59 years, and there is no generational replacement plan (SENASA, 2016). With limited resources, SENASA struggles to perform all tasks needed (e.g. farm inspection, specific extension services, the reduction of informality in animal production, etc.).

Costa Rica's sanitary and phytosanitary services are comprehensive and considered by users and producers alike to be of high technical quality. (That said, some measures have attracted criticism from trading partners, see Section 2.4 below). One challenge, however, is ensuring co-ordination across the range of other agencies and ministries involved in these services, customs included.

Marketing and promotion

The CNP promotes special farmer fairs (*Ferias del Agricultor*) which seek to link producers and consumers. There are 76 farmer fairs which mostly market fruits and vegetables. These fairs take place in peripheral areas of urban centres, and represent only 5% of the national fresh food market. In 2015, the budget from CNP was USD 867 000 (CNP, 2016).

In addition, the Costa Rican agricultural sector maintains an **information system** called InfoAgro, which provides information on agricultural statistics, prices and markets, agricultural legislation, institutional framework and services, research and technology, agricultural news and training, etc. Resources allocated to this service in 2015 amounted to USD 530 000 (SEPSA, 2016b).

Costa Rica´s Export Promotion Agency (PROCOMER) is a public non-state entity, created under Act No. 7638 in 1996, which is tasked with the **promotion of Costa Rican exports**, including agricultural products. PROCOMER is responsible for: 1) the design and co-ordination of programmes related to exports and investments; 2) the provision of technical and financial support to the Ministry of Foreign Trade (COMEX); 3) the centralisation and streamlining of import and export procedures; and 4) the collation and analysis of external trade statistics. In 2013, PROCOMER created a country brand: *Essential Costa Rica*. This brand was conceived as a tool for the market positioning and differentiation of Costa Rican exports, as well as for the promotion of tourism and the attraction of investment. Services provided by PROCOMER have to be paid for by users, including agricultural producers (COMEX, 2016c).

Infrastructure-Irrigation

Agricultural infrastructure has been significantly neglected over the past 30 years, and limited large-scale irrigation works have been undertaken. More recently, however, renewed efforts are underway, and investments have substantially increased. Irrigation programmes are conducted by SENARA. There are two types of programmes: 1) off-farm programmes that involve large-scale irrigation, and 2) on-farm programmes involved in the construction of private irrigation and drainage projects. For the former, SENARA manages the Arenal Tempisque Irrigation District (DRAT), a large-scale public investment, under which farmers pay for the use of the infrastructure (at USD 120/ha per year). Products which benefit

from this programme are rice, sugar cane, and pastures, and fish. SENARA also finances private irrigation investments through the Irrigation of Small Areas (PARD) programme (see section on input subsidies). Investments on off-farm infrastructure, particularly on the DRAT programme, increased substantially from USD 9.6 million in 2014 to USD 21 million in 2015 (SENARA, 2015).

Rural and territorial development

One of the pillars of the agricultural strategy – **rural territorial development** – is implemented by INDER. INDER, created under Law 9036, has two main broad areas of responsibility: 1) land management and regulation, covering land acquisition, assignment and titles, and ensuring rural settlement on land distributed by the state; and 2) territorial development management, under which it develops rural infrastructure projects, provides organisational and entrepreneurial management and rural credit – at preferential interest rates to finance services, agriculture, livestock, small-scale rural industries, trade, and ecotourism – and improves food nutrition and security through auto-consumption modules of organic agriculture. The funding of land projects, including rural settlement, totalled USD 12.5 million in 2015. Loans allocated between 2004 and 2015 totalled USD 5 million (INDER, 2016). INDER furthermore promotes the establishment of the Regional Boards of Territorial Development (CTDR), which elaborate development plans for specific areas. 27 territories have been identified, of which 18 have established their CTDR. Six of these have approved Zoning Plans.

The institute also manages programmes for the creation of non-farm job opportunities for women and rural youth (INDER, 2016). This aspect it is crucial, as not all smallholders will survive within the agricultural sector, this implies an important role for social policies in addressing the needs of those unable to **adjust**. Policies to address rural poverty cannot only focus on agriculture-led development, they need to be situated within broader rural development approach aimed at creating non-agricultural opportunities in rural areas and avoid mass migration to the cities (OECD, 2008, 2012).

One key bottleneck faced by INDER is the lack of an efficient co-ordination mechanism with other governmental institutions. As the institution in charge of territorial development, there is a need to articulate efforts and allocate resources in a timely manner – the execution of the annual budget of INDER can be as low as 50% – however, as is the case with other APS institutions, co-ordination mechanisms across related ministries such as education, health, infrastructure, social development, agriculture, and local governments are weak.

Water management policies

SENARA is responsible for the management of irrigation services in Costa Rica. As such, it sets **water prices for agricultural uses**. For instance, charges for the use of gravity-fed irrigation were set in 2014 at USD 114/ha/year and for pumping irrigation at USD 0.007/m^3 (SENARA, 2016). A new Law for Water Resources is under discussion. Further information on the water pricing system can be found in Chapter 3.

Tax concessions

While there are no differentiated tax policies for the agricultural sector with regard to income taxes, sales tax or social security contributions, some tax concessions for agriculture do exist. Costa Rica maintains tax (VAT) exonerations (Law No. 6826) for some tax sales on staple food products, agricultural machinery, some veterinary products and agricultural

inputs. Other measures relate to organic agricultural production (Law No. 8591), such as the provision of tax and financial incentives to micro, small and medium-scale organic farmers in order to promote the development of organic farming activities. In addition, a tax exemption is applied to activities included in the Free Trade Zone Regime (RZF) (Section 2.4), one of the main instruments for industrial and export promotion in Costa Rica. This includes exemptions for registered export companies. For agriculture and fisheries, the registered products are pineapple, orange juice, and tilapia. Finally, Law No. 9071, which regulates agricultural land taxes, provides for a land property tax differentiation between urban and rural land, and between different land uses (SEPSA, 2016a).

Consumer measures

There are no direct agriculture-related subsidies for consumers. That said, the government's Institutional Supply Programme (PAI), which is managed by CNP, supplies public institutions – i.e. school cafeterias, hospitals and prisons – with agricultural products acquired mainly from small and medium-scale producers at market prices. PAI's outlays in 2015 were USD 42 million (CNP, 2016). Costa Rica also has several **social protection** programmes. For instance, a **cash transfer** programme, which is operated by the Joint Social Welfare Institute (*Instituto Mixto de Ayuda Social*, IMAS), provides cash transfers, training and food to the poorest households in the country, including impoverished, small-scale farmers and rural poor populations (IMAS, 2016). In 2015, IMAS spent about USD 260 million on these types of social protection programmes (IMAS, 2016).

2.4. Trade policies affecting the agricultural sector

In the early 1990s, Costa Rica embarked upon a series of trade liberalisation measures. Reforms focused on the elimination of price controls, the removal of export taxes, and tariff reductions. In the agricultural sector, these reforms led to increased production of non-traditional products – not only in terms of volume, but also in the variety of products, such as pineapple, citrus, mango, roots and tubers, peach, flowers and ornamental plants flowers and palm oil. Costa Rica is now fully integrated into international markets and, while import tariffs continue to be applied on *some* agricultural products, many are either not applied or will be gradually phased out under Costa Rica's numerous Free Trade Agreements (FTAs).

Overall reforms of the trade system

When Costa Rica began to liberalise trade in the 1990s, it did so under several multilateral, regional and bilateral trade agreements. In 1990, it joined the General Agreement on Tariffs and Trade (GATT) and subsequently, in 1995, the World Trade Organisation (WTO). This membership entailed tariff reductions, the removal of import licences for basic grains, new sanitary and quality standards, and changes to subsidies and support for producers. Over the same period, a number of important FTAs were also signed.

Export incentives, such as Tax Credit Certificates (CAT), were also adopted around the same time, and exports to markets outside Central America were promoted. The CAT was eventually phased out in 2012. Improvements were made in the institutional framework for price support, and the influence of the state in the economy was reduced by dismantling state enterprises or reducing their functions. All of these changes promoted the modernisation of agricultural production in order to enable it to compete in international markets.

The government also established the **Free Trade Zone Regime** (FTZ), one of the most successful policy tools that Costa Rica has to attract FDI. It consists of a set of incentives that the State grants to companies, foreign or domestic, that meet certain requirements and obligations set out under the Law No. 7210 and Executive Decree No. 34739-COMEX-H. The Regime, which continues to operate today, was created under the 1990 Law on Export Free Zones, and explicitly grants tax benefits and preferential port rates to companies operating under its auspices. Some examples are: the establishment of export companies in manufacturing, and the production, processing and marketing of non-traditional agricultural products – such as pineapple, orange juice and processed tilapia – for export. Meanwhile, the development of Costa Rica as a tourist destination aided the marketing of its agricultural products in foreign markets (SEPSA, 2015b).

These changes took place in parallel with three **Structural Adjustment Programmes** (SAPs)[14] that allowed Costa Rica to obtain important external resources in exchange for commitments to substantial reforms to policies and national institutions, such as reductions both in the size of the public sector and the budget deficit. These commitments enabled the country to recover from an economic recession, restore the balance in macro variables (inflation, trade and the fiscal deficit), and facilitate the transition between import substitution and export promotion.

These reforms also strengthened **private enterprises** and producer organisations. At the same time, state interventions in the agricultural sector were further reduced. The SAPs promoted the reduction of interventions by the National Production Council (CNP) in grain markets and the elimination of price controls and profit margins in favour of free competition. Important reforms to the foreign exchange market were also made – initially, small devaluations favoured exporters; subsequently, with a greater degree of liberalisation, a managed float exchange rate system was introduced (COMEX, 2015).

Trade agreements

Costa Rica is active in the **multilateral trading system**. As a member of the WTO, it grants most-favoured-nation (MFN) treatment to all its trading partners. Costa Rica participated in the WTO Information Technology Agreement (ITA) and the negotiations on financial services, accepting the Fifth Protocol to the General Agreement on Trade in Services (GATS).

Costa Rica has also negotiated multiple FTAs, and is currently a signatory to 14 FTAs in force with 50 trading partners, both bilaterally and as a member of the Central American Common Market (CACM) (Table 2.4). These agreements include Costa Rica's largest trading partners – the United States, European Union and China – and cover almost 93.4% of its exports and almost 83% of imports (COMEX, 2015). Several agricultural products – such as rice, poultry and dairy products and sugar – are excluded from most, but not all, agreements. Where these products are included, they tend to be subject to special treatment, such as extended phase-outs for protection or grace periods. A number of these extended phase-out periods are still in effect, but are due to end by 2025 (CAFTA-DR), or 2027 (European Union) at latest. See Annex 2.A4 for more details on the provisions related to agriculture – products subject to phase outs or exclusions, in particular – in the most important trade agreements.

Under all its FTAs, restrictions on imports and exports are prohibited, but Costa Rica may maintain controls on: (a) the import of crude oil, its fuels, derivatives, asphalt, and gasoline; (b) the exports of wood in logs and boards from forests; exports of hydrocarbons; quality export control of coffee; and (c) the import and export of ethanol and crude rums.

Table 2.4. **Costa Rica's Free Trade Agreements**

Agreement	Partners	Date of entry into force
General Treaty on Central American Economic Integration	El Salvador, Guatemala, Honduras and Nicaragua Panama	23 September 1963 On 6 May 2013, Panama joined the Central American Economic Integration System
Free Trade Agreement between the Government of the Republic of Costa Rica and the Government of Canada (CCRFTA)	Canada	7 November 2002
Free Trade Agreement between the Government of the Republic of Costa Rica and the Community of Caribbean States (CARICOM)	Trinidad and Tobago Guyana Barbados Belize Jamaica	15 November 2005 30 April 2006 1 August 2006 10 March 2011 1 July 2015
Free Trade Agreement between Central America and Chile, and Deputy Bilateral Protocol signed between the Republics of Costa Rica and Chile	Chile	15 February 2002
Free Trade Agreement between the Government of the Republic of Costa Rica and the Government of the People's Republic of China	China	1 August 2011
Free Trade Agreement between the Dominican Republic, Central America and the United States (CAFTA-DR)	Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and the United States	1 January 2009
Free Trade Agreement between the Government of the United Mexican States and the Republics of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua	Mexico	1995 1 July 2013 (updated)
Free Trade Agreement between Central America and Panama, and the Bilateral Protocol between Costa Rica and Panama to the Free Trade Agreement	Panama	24 November 2008
Free Trade Agreement between Central America and Dominican Republic	Dominican Republic	7 March 2002
Free Trade Agreement between the Government of the Republic of Costa Rica and the Government of the Republic of Peru	Peru	1 June 2013
Free Trade Agreement between the Republic of Costa Rica and the Republic of Singapore	Singapore	1 July 2013
Agreement establishing an Association between the European Union and its Member States, on the one hand, and Central America on the other (EU-CAAA)	EU-27	1 October 2013
Free Trade Agreement between the EFTA States and the Central American States	Norway Switzerland, Liechtenstein Iceland	19 August 2014 29 August 2014 5 September 2014
Free Trade Agreement between the Government of the Republic of Costa Rica and the Government of the Republic of Colombia	Colombia	1 August 2016
Not in force		
Free Trade Agreement between the Government of the Republic of Costa Rica and the Community of Caribbean States (CARICOM)	Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname	Pending legislative approval in these countries
Under negotiation		
Free Trade Agreement between Central America and the Republic of Korea	Republic of Korea	

Source: COMEX (2016a), *http://www.comex.go.cr/tratados/index.aspx*.

Regional trade agreements

Costa Rica participates in the **Central America Common Market (CACM)**, together with El Salvador, Guatemala, Honduras, Nicaragua and Panama. CACM accounts for 7% of imports and 24% of total merchandise exports. CACM has adopted a number of regional regulations (2016), including the Central American Uniform Customs Code, and the Convention on the Central American Tariff and Customs Regime, as well as Central American regulations on customs valuation, rules of origin, unfair trade practices, safeguard measures, and the standardisation of Sanitary and Phytosanitary Measures (SPS) and technical regulations.

CACM has a common external custom duty, the Central America Import Tariff (ACI), which covers 6 978 items at the 8-digit level, excluding products traded with Panama. In 2015, the CACM countries were still in the process of harmonising ACI tariff lines; 93.4% of these consignments had been harmonised, and the remaining 6.6% mostly comprise vehicles (2.3%), agricultural products (2.7%) and industrial goods (1.7%). In 2010, CACM members launched the Computerized Central Tariff (AIC), which contains all tax and tax reductions for products entering the CACM. Non-tariff measures – such as technical regulations or SPS measures – are also included in the system.

Central American countries have adopted a number of customs reforms to facilitate trade in the last decade. Initiatives have been launched to reduce customs controls and facilitate the intra-regional movement of goods by applying a common customs valuation system and risk assessment, and introducing the electronic transmission of data. Harmonisation of customs procedures has also progressed. In 2007, the Framework Convention for the Establishment of the Customs Union was signed. The Convention, which was ratified by Costa Rica in 2009, includes three stages in the customs union process: 1) institutional strengthening, 2) trade facilitation, and 3) regulatory convergence (COMEX, 2015). In the context of this framework, technical regulations for various sectors – food, medicines and agricultural inputs – have been negotiated and enforced, facilitating the introduction of a sanitary register for authorised products, and the application of SPS measures in a more consistent manner.

Costa Rica also benefits from an FTA between CACM, the United States and the Dominican Republic (**CAFTA-DR**). In 2015, trade under this agreement represented 51% of all Costa Rican goods imports and exports (COMEX, 2016b). Costa Rica offers zero tariffs and immediate access to all imported goods from the Dominican Republic, with a few exceptions for agricultural products. Trade with all other member states – the United States included – falls under the Costa Rican Reduction Programme. The programme covers a 20-year-period, at the end of which, in 2025, 99.92% of Costa Rican tariffs will be eliminated for imports from the United States, with fresh potatoes being the only exception.

Bilateral trade agreements

The FTA between Costa Rica and the People's Republic of **China** (hereafter "China") entered into force in 2011, prompting significant growth in bilateral trade, both in terms of trade volume and the diversification of traded goods and services. A transition period applies to liberalisation. In 2011, prior to the entry into force of the FTA, 2.2% of Costa Rica's tariff lines were duty-free for imports from China. 91% of Costa Rica's tariffs on Chinese imports are scheduled to be removed in January 2026. The parties may apply bilateral safeguard measures during the transition period, however, and 591 dutiable tariff lines will still remain after 2026. Moreover, the treaty does not contain rules on subsidies, state aid and government procurement.

Since 1995, 98% of goods can be traded duty-free between Costa Rica and **Mexico**. The FTA between Central America and **Panama**, and the Costa Rica-Panama Bilateral Protocol, established a tariff liberalisation process between 2009 and 2025, with 98.2% of tariff lines to be duty-free at the end of the period – although 109 lines will remain dutiable, including pork and poultry, eggs, potatoes, onions, coffee and coffee extracts, rice, animal and vegetable oils and fats and sugar. For some products subject to liberalisation, tariff quotas are used on a temporary basis. FTAs between Costa Rica and **Peru** and **Singapore** entered into force on 1 June 2013 and 1 July 2013 respectively, followed by **Colombia** on 1 August 2016.

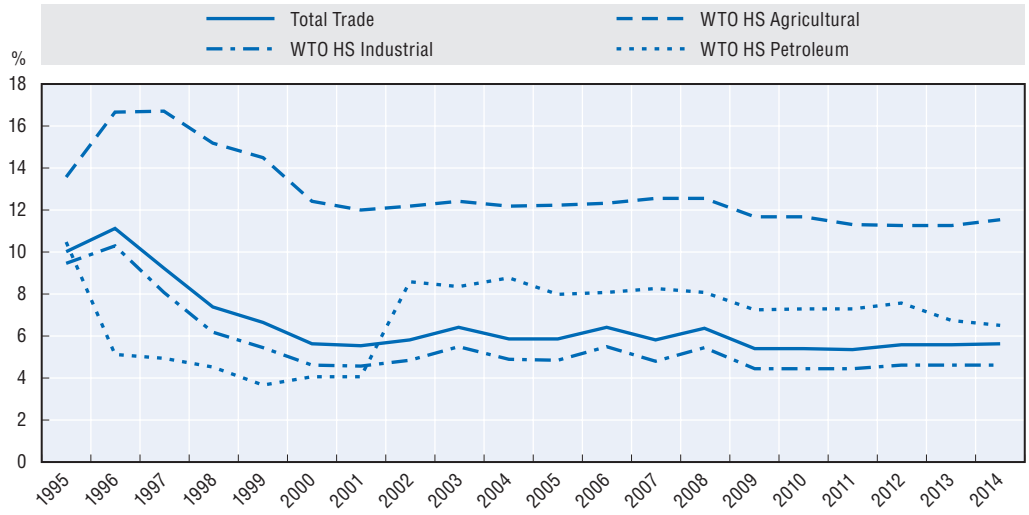
On 29 June 2012, Costa Rica signed the Association Agreement between Central America and the **European Union** (EU-CAAA). The Agreement, which entered into force on 1 October 2013, comprises three pillars which include political dialogue, co-operation, and trade. The EU-CAAA could improve access conditions for Costa Rican goods and services to the European Union. In particular, it strengthens and improves the unilateral preferences granted by the EU through its Generalised System of Preferences (GSP), and opens new opportunities for numerous other products – such as sugar, meat, cassava and textiles – to enter the European market.

Import policy measures

Tariffs

Tariffs are the main instrument for trade protection in Costa Rica's agricultural sector, although these have declined since Costa Rica joined the WTO in 1995. Between 1995 and 2014, the MFN average tariff for agricultural goods decreased by 31%. The largest decrease could be observed between 1996 and 2001 (-11%) and a smaller decrease between 2000 and 2014 (-8%) (Figure 2.6).

Figure 2.6. **Most Favoured Nation (MFN) tariff, simple average (%), 1995-2014**



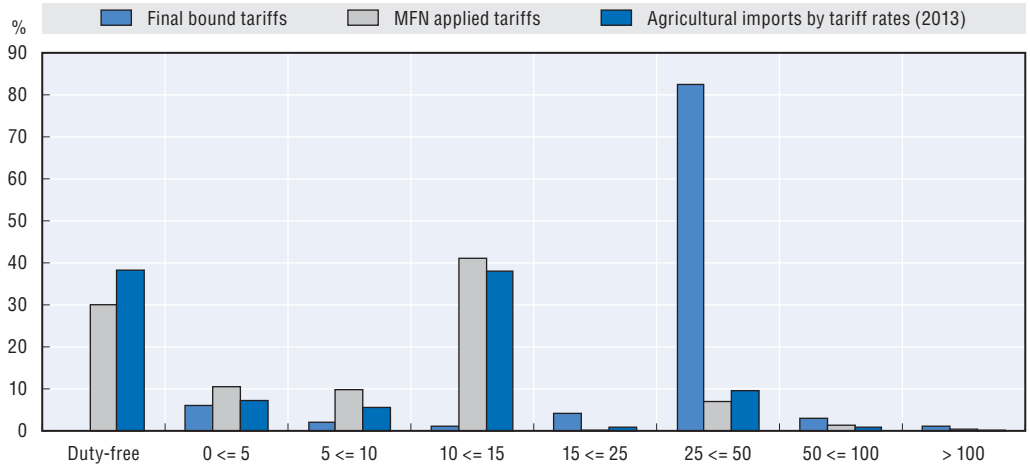
Source: TRAINS-WITS Database (2016).

StatLink http://dx.doi.org/10.1787/888933451782

Nevertheless, agricultural tariffs are high compared to tariffs on total trade, industrial goods and petroleum. The average MFN tariff for agricultural goods in 2014 was 11.5% – more than twice the average MFN tariff for total trade and industrial goods. During the 2006-13 period, the only major change to Costa Rica's tariff structure was an increase in the number of tariff lines as a result of amendments to the Harmonized System (HS) (Annex 2.A3).

The vast majority (91%) of applied MFN tariffs are in the range of 0-15%, of which over half are less than 10% (Figure 2.7). Around 41% of applied MFN tariffs are between 10% and 15%. MFN tariffs of over 50% are rare, and constitute less than 2% of all tariffs. Final bound tariffs are generally higher, with 83% between 25% and 50%. Agricultural products are mainly imported duty-free (38%), or with tariffs of lower than 15% (51%). However, remaining tariffs on agricultural imports are amongst the highest, with applied MFN tariff of 151% for poultry, 66% for dairy products, 46% for both pork meat and sugar, and 36% for rice, among others.

Figure 2.7. **Frequency distribution of agricultural final bound and MFN applied tariff lines and imports by tariff rates, 2014**



Source: WTO Tariff Profile of Costa Rica (2016), *http://stat.wto.org*.

StatLink *http://dx.doi.org/10.1787/888933451795*

Almost all imports from the CACM (Panama excluded) enter Costa Rica duty-free, with the exception of sugar and coffee. Tariff preferences are meanwhile granted to imports from Canada, Chile, China, Mexico, the United States, Panama, the Dominican Republic and the CARICOM[15] countries. Table 2.5 contains a snapshot of Costa Rica's preferential tariffs at the beginning of 2013. The transitional periods for the full tariff liberalisation agreed under the FTAs with Chile, Canada, CAFTA-DR, China, and Central America and Panama have not yet ended (COMEX, 2015).

Table 2.5. **Summary analysis of Costa Rica's preferential tariffs, 2013**

	Total		Agricultural products (WTO definition)		Non- agricultural products (WTO definition)	
	Average[1]	Duty-free lines	Average[1]	Duty-free lines	Average[1]	Duty-free lines
MFN	6.9	2.8	14	-	5.5	3.4
CACM						
Guatemala, Honduras, Nicaragua	-	99.8	0.3	98.8	-	100
El Salvador[2]	0.1	99.8	0.3	98.5	-	100
CARICOM[3]						
Barbados	1.1	93	4.8	77.9	0.4	96
Belize	1	93.6	4	81.3	0.4	96
Guyana	1.1	93.1	4.4	78.7	0.4	95.9
Trinidad and Tobago	1	93.4	4.3	79.9	0.4	96
CAFTA-DR						
United States	1.3	75.4	4.9	49.3	0.6	80.4
Dominican Republic	0.8	96.3	4.4	82.8	0.1	98.9
Bilateral FTAs						
Canada	1.3	81	6.3	48.7	0.4	87.3
Chile	1.1	94.6	6	74.9	0.1	98.5
China	3.9	62.2	8.8	45.8	2.9	65.4
Mexico	0.8	97.7	4.8	86.7	-	99.8
Panama[4]	0.9	89	3.7	82.3	0.4	90.3
Dominican Republic	0.5	97.8	2.9	88.6	-	99.5

1. Calculations were made using the lower of the MFN and preferential rates.
2. In the case of El Salvador, five additional lines are not duty-free, which explains the differences in the figures compared to the other CACM countries.
3. In force in 2013 between Costa Rica and Trinidad and Tobago, Barbados, Belize and Guyana only.
4. Bilateral Protocol between Costa Rica and Panama, within the framework of the Central America-Panama Free Trade Agreement.

Source: WTO Secretariat, based on data provided by the Costa Rican authorities.

Tariff-rate quotas

Costa Rica has tariff quotas for 27 agricultural products,[16] which are not managed through import licences but are allocated through a market mechanism that involves an administrative procedure. The tariff quotas are governed by the Regulation on Distribution and Allocation of Import Quotas, effective since 2003.[17] COMEX allocates quotas based on historical record – 80% of the available volume is assigned to applicants that have already imported under the quota during the previous calendar year. The quota is issued in proportion to their participation in total imports under the quota. The remaining 20% is issued to new applicants on a pro rata basis. Apart from dairy products, use of the quotas has been low, as tariff quotas with better conditions were negotiated within FTAs for almost all products subject to WTO quotas. Costa Rica applies import tariff quotas for agricultural products from Canada, China, the United States, the Dominican Republic, Panama, the European Union, Peru and Colombia under the corresponding preferential trade agreements.

Import licences

Nevertheless, licences or authorisations – generally related to health and phytosanitary protection, public safety and environmental protection – are required to import certain goods. In most cases, import licences must be obtained through the Single Window for Foreign Trade (VUCE). Since its launch in 2011, the VUCE 2.0 System automates 100% of import and export procedures year-round in order to reduce time and costs for users.

Sanitary and phytosanitary (SPS) measures on imports and technical regulations

Since 2007, Costa Rica has adopted 125 technical regulations, most of which are related to products such as pesticides, fuels, medicines, textiles, cosmetics and food. Many of these regulations were issued under the General Treaty on Central American Economic Integration. Costa Rica has also continued to strengthen its infrastructure and institutional capacity to implement SPS measures, with the aim of facilitating trade as much as possible while protecting the country from pests and diseases. Efforts have been made to promote private sector participation in the formulation of SPS measures. Agreements have been reached on the equivalence of inspection systems with business partners in North America, and progress has been made in the harmonisation of SPS measures and procedures in place in Central America.

In 2014-16, several measures were taken regarding the imports of potatoes, avocados and pineapple for exports. In the case of potatoes from the United States, the temporary suspension of imports was prompted by the interception of a quarantine pest known as "zebra chip" in a shipment of potatoes (WTO notification: DSFE-12-2016 under G/SPS/N/CRI/122). Imports of Canadian potatoes were also suspended due to the presence of the pest "phytoplasma purple top wilt" in potato fields (WTO notification DSFE-12-2014, under G/SPS/N/CRI/152). In the case of avocados, the import measure restriction was applied in order to avoid the risk of the sun blotch disease (G/SPS/N/CRI/160 and G/SPS/N/CRI/162). These measures have been criticised by the relevant trading partners[18]. Trading partners have also mentioned delays in the emission of sanitary import permits, warehouse specific space requirements for imports and other requirements resulting in lengthy trade processes.

Export policy measures

There are four main incentive regimes currently in force in Costa Rica: 1) the Free Zone Regime, 2) the Inward Processing Regime; and 3) the Drawback Regime – all granted by COMEX, acting in conjunction with the President of the Republic, and administered by PROCOMER – and 4) the Tourism Development Incentives Regime, granted and administered by the Costa Rican Tourism Institute (ICT). These incentive regimes apply equally to nationals and foreigners. With regard to the Free Zone Regime in particular, all links between exports and incentives were eliminated on 31 December 2015, in line with the WTO Agreement on Subsidies and Countervailing Measures and the extensions of the term for subsidies granted on exports.

2.5. Evaluation of support to agriculture

This section provides a quantitative evaluation of support allocated to Costa Rican agriculture between 1995 and 2015. This evaluation is based on OECD indicators of agricultural support, including the Producer Support Estimate (PSE), Consumer Support Estimate (CSE), Total Support Estimate (TSE), General Services Support Estimate (GSSE), and others (Box 2.3).

A detailed description of the methodology applied by the OECD to estimate agricultural support (the "PSE Manual"), as well as comprehensive databases for OECD countries and a number of non-OECD countries are available at *http://oe.cd/pse*. The methodology applied in this study is consistent with that used in OECD reports that monitor and evaluate agricultural policies in other countries (OECD, 2016b). Box 2.4 provides basic information on how this methodology has been applied to the case of Costa Rica.

Support to agricultural producers

Level of producer support

The percentage **Producer Support Estimate** (**%PSE**) is the OECD's key indicator to measure support to agricultural producers. It expresses the monetary value of support transfers to agricultural producers as a percentage of producer gross receipts. As it is neither affected by inflation nor the size of the sector, it allows comparisons in the level of support to be made both over time and between countries. This indicator provides insights into the burden that agricultural support policies place on consumers (i.e. market price support) and taxpayers (budgetary transfers). Estimations suggest that market price support (MPS) is the primary source of support. Costa Rica's %PSE for the 2013-15 period is estimated at 10.1%, indicating that 10.1% of gross receipts of agricultural producers is generated by support policies. MPS has been the main component of producer support (97% of PSE), while budgetary support has been low (3%).

A clear trend of increasing support through MPS can be observed in Figure 2.8 and Table 2.6. This reflects the use of price-setting mechanisms for rice and the use of tariffs on main products (e.g. rice, poultry, pigmeat). While such support runs counter to pro-market policies such as the FTAs signed in the last 10 years, the FTAs generally contain exceptions or special treatment for certain agricultural products.

Box 2.3. **OECD indicators of support to agriculture**

INDICATORS OF SUPPORT FOR PRODUCERS

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.

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

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

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 NPC is also available by commodity.

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 policy measures directly linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

Producer Percentage Single Commodity Transfers (producer %SCT): The commodity SCT as a share of gross farm receipts for the specific commodity.

INDICATORS OF SUPPORT TO CONSUMERS

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.

Percentage CSE (%CSE): CSE as a share of consumption expenditure (measured at farm gate) net of taxpayer transfers to consumers.

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 (measured at farm gate).

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).

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 policy measures directly linked to the production of a single commodity.

INDICATORS OF SUPPORT TO GENERAL SERVICES FOR AGRICULTURE

General Services Support Estimate (GSSE): The annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture, regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

Percentage GSSE (%GSSE): GSSE as a share of Total Support Estimate (TSE).

INDICATORS OF TOTAL SUPPORT TO AGRICULTURE

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 associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Percentage TSE (%TSE): TSE as a share of GDP.

Box 2.4. **Calculation of PSE for Costa Rica**

Broadly speaking, the PSE has two main components: market price support and budgetary allocations.

1) Market Price Support

Market price support (MPS) is based on the measurement of the gap between a country's domestic prices and international prices. This price gap results from a variety of policy measures that prevent domestic prices from aligning with international levels. These policies include trade measures such as import tariffs, import quotas, tariff quotas, SPS regime, export subsidies, export taxes, as well as quantitative restrictions on exports. Policies creating a price gap also include domestic measures, such as administered pricing, market interventions, or public stockholding. In emerging and developing economies, the gaps between domestic and international prices are also explained by factors that are not strictly policy-related, e.g. deficiencies in physical infrastructure, inadequate information and weak market institutions. Market price support is financed by consumers through higher prices. In the case of Costa Rica, the MPS is calculated on the basis of the following information:

Period covered: 1995-2015

***Products covered*:** Rice, pineapples, bananas, coffee, sugar cane, palm oil, milk, beef, pigmeat, poultry (see Annex 2.A5 for more details on these products). These ten commodities account for 80% of the total value of gross agricultural output (GAO) in Costa Rica. The six crops accounted for 75% of the value of total crop production in 2015, the four livestock products represented on average 90% of total livestock production for the same year. For the purpose of the PSE estimations, seven products are treated as net exports (X): pineapples, bananas, coffee, sugar cane, palm oil, beef, milk; three products are treated as net imports (M): rice, poultry and pigmeat.

Producer prices: These are average prices received by producers at farm gate level. This information has been provided by SEPSA-MAG, sourced from different institutions and farmer corporations. Producer prices for rice, pineapple, banana, coffee, milk, beef and pigmeat were registered numbers. Producer prices for sugar cane, palm oil, and poultry were estimated by SEPSA.

External reference prices: Average export unit values registered at the border were used as the external reference price for pineapples, bananas, sugar cane, coffee, palm oil, and milk sourced by COMEX. For rice, average import unit values at the border were used. Import unit values for poultry were not sufficiently consistent across the period, which prompted the use of USA producer price-adjusted (added) with international transportation costs from the USA to Costa Rica. Lastly, for milk, the reference price used export unit values for both butter and skimmed milk powder. Data was provided by SEPSA and COMEX.

Marketing margins: Marketing margins are estimations of processing, handling and transportation costs for a given commodity. Marketing margin adjustment to the reference prices is required to make those prices comparable with domestic prices measured at the farm gate. For most of the products, margins were expressed as a percentage of the farm gate prices. For a few products, registered data on processing and transportation costs were used, as well as the difference between the farm gate and the wholesale price, ensuring that prices were expressed in the same weight terms. Data was provided by SEPSA.

Price gap estimates. The "zero price gap" was used when negative gaps were obtained, as the estimated negative price gaps reflect factors other than agricultural policies. This assumption was used for exported products like pineapples, bananas, coffee, sugar cane, palm oil, milk and beef. For pigmeat, the annual average tariff rate was used to estimate the price gap.

2) Budgetary Support

Budgetary support comes from government revenues. Budgetary information for 1995-2015 was provided by SEPSA and the Ministry of Finance, and covers federal budgetary expenditure undertaken by the APS. Information from other Ministries, such as MINAE, was also included. The implicit subsidy arising from preferential credit interest rates and insurance is also estimated.

Table 2.6. **Estimate of support to agriculture in Costa Rica, CRC million**

	1995-97	2013-15	2013	2014	2015
Total value of production (at farm gate)	**452 886**	**2 568 361**	**2 452 966**	**2 640 897**	**2 611 221**
of which: share of MPS commodities (%)	*71.8*	*85.3*	*85.1*	*84.8*	*86.0*
Total value of consumption (at farm gate)	**217 443**	**1 257 102**	**1 219 301**	**1 284 947**	**1 267 058**
Producer Support Estimate (PSE)	**17 814**	**259 452**	**243 711**	**218 511**	**316 133**
Support based on commodity output	16 203	250 503	236 314	210 319	304 876
Market Price Support[1]	*16 203*	*250 503*	*236 314*	*210 319*	*304 876*
Payments based on output	*0*	*0*	*0*	*0*	*0*
Payments based on input use	1 611	8 254	6 697	7 497	10 570
Based on variable input use	1 201	1 632	1 463	1 020	2 414
with input constraints	*5*	*1 517*	*1 337*	*945*	*2 270*
Based on fixed capital formation	*235*	*5 070*	*3 809*	*4 892*	*6 510*
with input constraints	*58*	*2 731*	*2 364*	*2 861*	*2 968*
Based on on-farm services	*176*	*1 552*	*1 425*	*1 584*	*1 646*
with input constraints	*172*	*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	663	694	642	652
Based on long-term resource retirement	0	663	694	642	652
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	31	6	52	35
Percentage PSE (%)	**4.0**	**10.1**	**9.9**	**8.2**	**12.1**
Producer NPC (coeff.)	**1.04**	**1.11**	**1.11**	**1.09**	**1.13**
Producer NAC (coeff.)	**1.04**	**1.11**	**1.11**	**1.09**	**1.14**
General Services Support Estimate (GSSE)	**1 345**	**34 910**	**29 680**	**32 604**	**42 446**
Agricultural knowledge and innovation system	126	16 688	16 281	16 780	17 002
Inspection and control	7	4 941	5 106	4 718	4 998
Development and maintenance of infrastructure	1 149	12 273	7 355	10 153	19 311
Marketing and promotion	64	715	672	726	746
Cost of public stockholding	0	0	0	0	0
Miscellaneous	0	294	266	227	389
Percentage GSSE (% of TSE)	**7.1**	**11.9**	**10.9**	**13.0**	**11.8**
Consumer Support Estimate (CSE)	**-17 652**	**-258 365**	**-248 102**	**-223 790**	**-303 203**
Transfers to producers from consumers	-16 110	-227 867	-218 169	-197 479	-267 952
Other transfers from consumers	-1 542	-30 498	-29 933	-26 310	-35 251
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	0	0	0	0	0
Percentage CSE (%)	**-8.3**	**-20.6**	**-20.3**	**-17.4**	**-23.9**
Consumer NPC (coeff.)	**1.09**	**1.26**	**1.26**	**1.21**	**1.31**
Consumer NAC (coeff.)	**1.09**	**1.26**	**1.26**	**1.21**	**1.31**
Total Support Estimate (TSE)	**19 160**	**294 362**	**273 391**	**251 115**	**358 580**
Transfers from consumers	17 652	258 365	248 102	223 790	303 203
Transfers from taxpayers	3 049	66 495	55 222	53 636	90 628
Budget revenues	-1 542	-30 498	-29 933	-26 310	-35 251
Percentage TSE (expressed as share of GDP)	**0.8**	**1.1**	**1.1**	**0.9**	**1.3**
GDP deflator 2000-02 = 100	**100**	**468**	**454**	**475**	**474**

NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A = area planted), An = animal numbers, R = receipts, I = income.
MPS commodities for Costa Rica are rice, pineapple, bananas, coffee, sugar, palm oil, milk, beef, pigmeat and poultry meat. MPS is net of producer levies and Excess Feed Cost.

Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451813

Table 2.7. **Estimate of support to agriculture in Costa Rica, USD million**

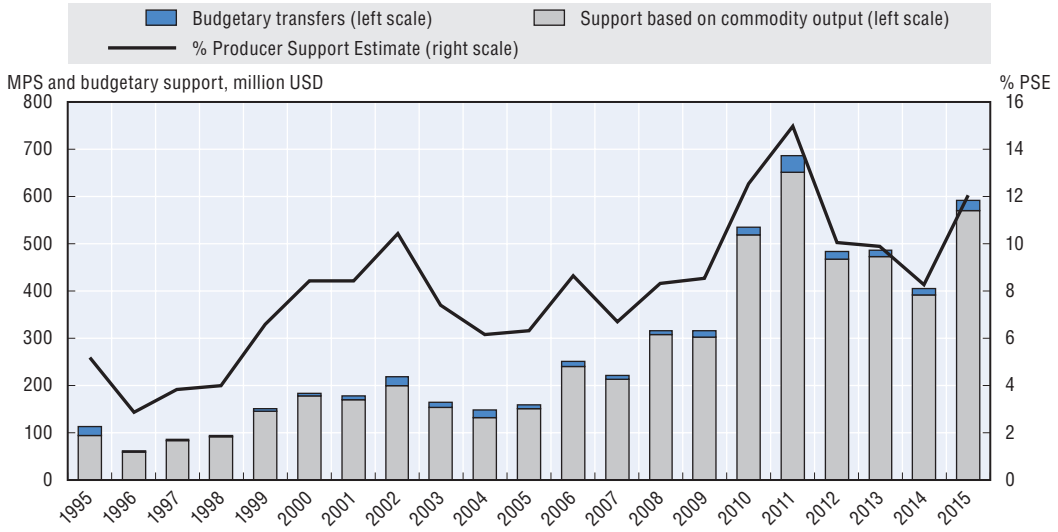
	1995-97	2013-15	2013	2014	2015
Total value of production (at farm gate)	**2 188**	**4 900**	**4 908**	**4 906**	**4 884**
of which: share of MPS commodities (%)	*71.8*	*85.3*	*85.1*	*84.8*	*86.0*
Total value of consumption (at farm gate)	**1 045**	**2 399**	**2 440**	**2 387**	**2 370**
Producer Support Estimate (PSE)	**87**	**495**	**488**	**406**	**591**
Support based on commodity output	79	478	473	391	570
Market Price Support[1]	*79*	*478*	*473*	*391*	*570*
Payments based on output	*0*	*0*	*0*	*0*	*0*
Payments based on input use	8	16	13	14	20
Based on variable input use	7	3	3	2	5
with input constraints	*0*	*3*	*3*	*2*	*4*
Based on fixed capital formation	*1*	*10*	*8*	*9*	*12*
with input constraints	*0*	*5*	*5*	*5*	*6*
Based on on-farm services	*1*	*3*	*3*	*3*	*3*
with input constraints	*1*	*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	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	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE (%)	**4.0**	**10.1**	**9.9**	**8.2**	**12.1**
Producer NPC (coeff.)	**1.04**	**1.11**	**1.11**	**1.09**	**1.13**
Producer NAC (coeff.)	**1.04**	**1.11**	**1.11**	**1.09**	**1.14**
General Services Support Estimate (GSSE)	**7**	**66**	**59**	**61**	**79**
Agricultural knowledge and innovation system	1	32	33	31	32
Inspection and control	0	9	10	9	9
Development and maintenance of infrastructure	6	23	15	19	36
Marketing and promotion	0	1	1	1	1
Cost of public stockholding	0	0	0	0	0
Miscellaneous	0	1	1	0	1
Percentage GSSE (% of TSE)	**7.1**	**11.9**	**10.9**	**13.0**	**11.8**
Consumer Support Estimate (CSE)	**-86**	**-493**	**-496**	**-416**	**-567**
Transfers to producers from consumers	-79	-435	-437	-367	-501
Other transfers from consumers	-8	-58	-60	-49	-66
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	0	0	0	0	0
Percentage CSE (%)	**-8.3**	**-20.6**	**-20.3**	**-17.4**	**-23.9**
Consumer NPC (coeff.)	**1.09**	**1.26**	**1.26**	**1.21**	**1.31**
Consumer NAC (coeff.)	**1.09**	**1.26**	**1.26**	**1.21**	**1.31**
Total Support Estimate (TSE)	**94**	**561**	**547**	**466**	**671**
Transfers from consumers	86	493	496	416	567
Transfers from taxpayers	16	127	110	100	170
Budget revenues	-8	-58	-60	-49	-66
Percentage TSE (% of GDP)	**0.8**	**1.1**	**1.1**	**0.9**	**1.3**
GDP deflator 2000-02 = 100	**100**	**468**	**454**	**475**	**474**

NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.
A = area planted, An = animal numbers, R = receipts, I = income.
MPS commodities for Costa Rica are rice, pineapple, bananas, coffee, sugar, palm oil, milk, beef, pigmeat and poultry meat. MPS is net of producer levies and Excess Feed Cost.

Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451821

Figure 2.8. **Level and composition of Producer Support Estimate in Costa Rica, 1995-2015**

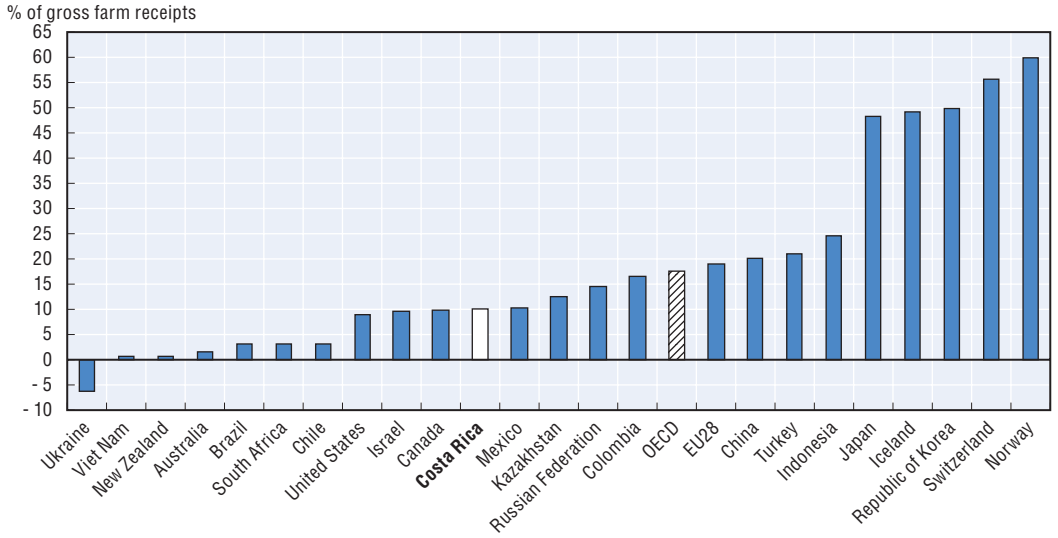


Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451805

The average level of producer support in Costa Rica of 10.1% (for the 2013-15 period) is lower than the OECD average of 17.5%, and around the same as Mexico and Canada (10%) (Figure 2.9).

Figure 2.9. **Producer Support Estimate in Costa Rica and selected countries, 2013-15**



1. 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.
2. The OECD total does not include the non-OECD EU member states.
Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

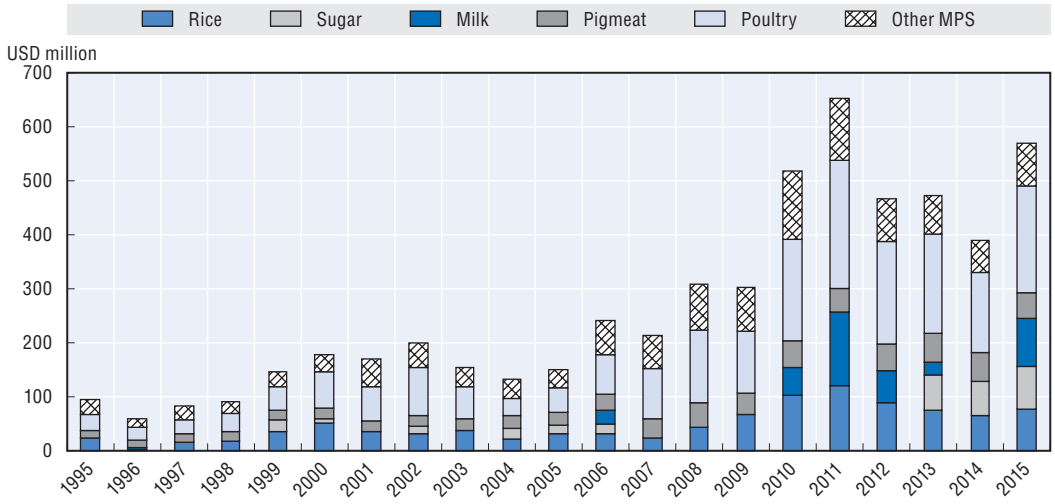
StatLink http://dx.doi.org/10.1787/888933451835

Composition of producer support by policy category

In addition to the level of support, it is also necessary to analyse the *way* in which support is provided to farmers. For instance, support may be given through MPS or input subsidies, it may take the form of a payment per hectare or per animal, or compensation to producer income. These distinctions are important, as support delivered in these various ways has a different impact on agricultural production, trade and incomes. Market price support is directly linked to commodity output and can have a significant effect on production. For this reason, this type of support qualifies as trade-distorting. Moreover, MPS is less effective in increasing producer income than other types of support, such as direct payments to farmers that are less attached to commodity output. MPS also imposes additional costs on domestic consumers. Support which is not based on commodity output – such as payments per hectare, or direct income support – can be more effective in improving farmer incomes, or in achieving environmental or rural development objectives, while having less spill-over effects on international trade (OECD, 2008).

The aggregate value of MPS is the outcome of implicit taxation through negative price gaps for some commodities (a negative MPS) and price support of others (a positive MPS). Annual variations depend on movements in world prices, domestic prices and exchange rates, as well as changes in production levels. Major components of the MPS are the price differential (gap between domestic producer price and reference price) for rice, poultry, pig-meat, sugar and milk (Figure 2.10). The MPS represents around 97% of the PSE for Costa Rica.

Figure 2.10. **Level and composition of Market Price Support (MPS) in Costa Rica, 1995-2015**

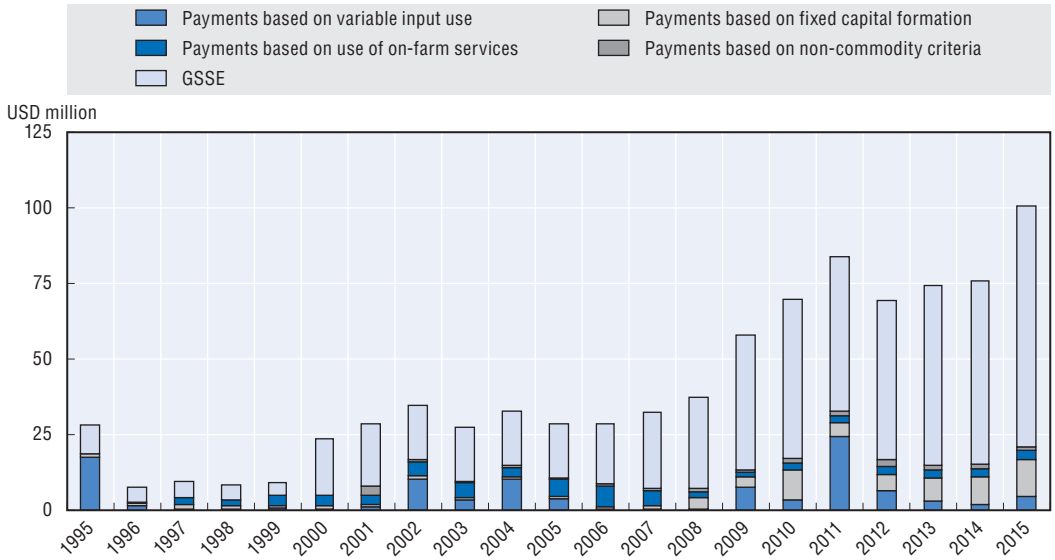


Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451845

Budgetary support is very low, and accounted for only a small (3%) share of producer support or PSE. Around 80% of these budgetary transfers were allocated to GSSE for the 2013-15 period. Input subsidies or direct payments were relatively small (Figure 2.11).

Figure 2.11. **Level and composition of budgetary transfers in Costa Rica, 1995-2015**



Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451857

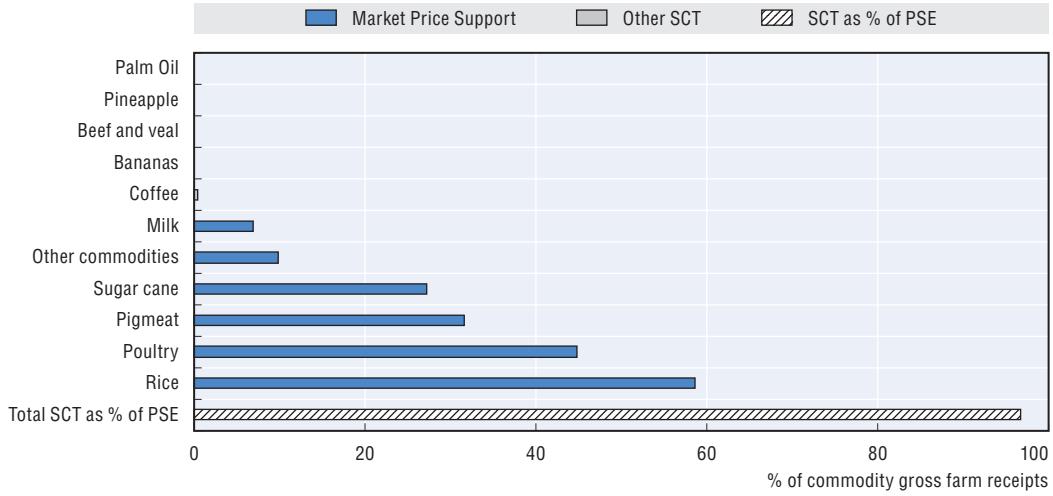
Commodity profile of producer support

Different levels of **support across commodities** are also reflected in the Producer Single Commodity Transfers (SCT), a measure of commodity-specific agricultural policies. This indicates the flexibility that policies accord to producers in their choices of product mixes. For example, a payment designated for only one specific commodity implies that in order to receive payment, a farmer must produce that commodity. The SCT can be expressed in relative terms as a percentage of gross receipts for a given commodity. A figure of 33%, for example, indicates that the value of transfers that are specific to that commodity is equivalent to one-third of gross farm receipts for that commodity. Figure 2.12 shows Costa Rican percentage SCTs (%SCT) for all ten products included in the PSE. These estimations principally reflect MPS. Poultry, pigmeat, rice and sugar have the highest percentage SCT, reflecting border and price measures.

Support provided to consumers of agricultural products

The Consumer Support Estimate (CSE) measures the **cost to consumers** arising from market price support policies and is measured at the farm gate level. A negative CSE indicates an implicit tax on consumers – i.e. they pay higher domestic prices than international prices – while a positive CSE suggests an implicit support – i.e. consumers pay domestic prices lower than the international price. In the OECD methodology, the consumer is understood to be the first buyer of these products. In the absence of consumer support policies, CSE generally mirrors MPS in broad terms. Similar to the PSE, the CSE can be expressed in relative terms as a percentage of consumption expenditures (%CSE). The average percentage CSE for Costa Rica is estimated at -20.6% in 2013-15, indicating that policies to support agricultural prices *increased* consumption expenditure by 20.6% on aggregate (Figure 2.13). Comparing across countries, this aggregate tax on consumers in Costa Rica is well above the OECD average of -7%.

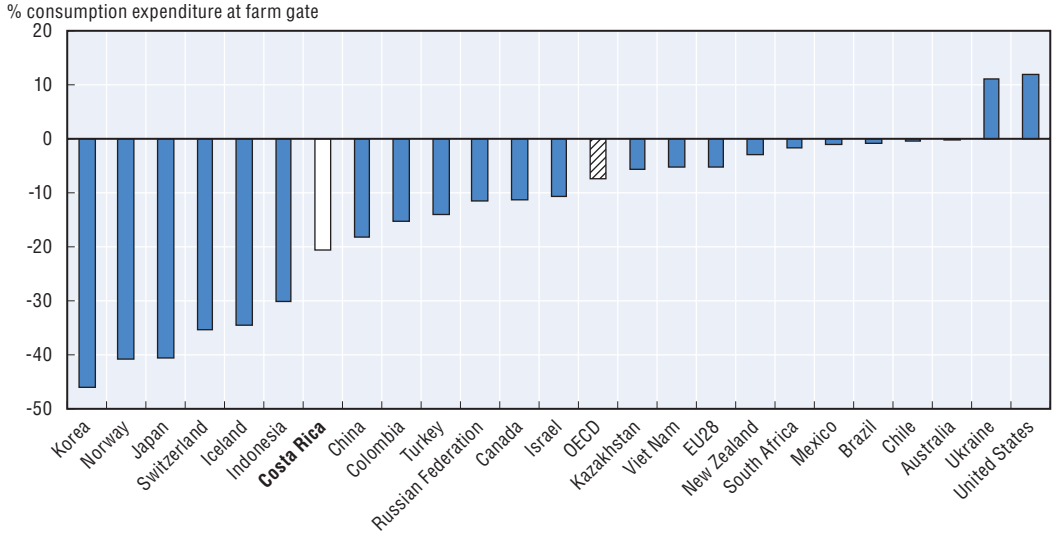
Figure 2.12. **Producer Single Commodity Transfers (SCTs) by commodity in Costa Rica, 2013-15**



Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451865

Figure 2.13. **Consumer Support Estimate (CSE) in Costa Rica and selected countries, 2013-15**



Note: 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.

Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

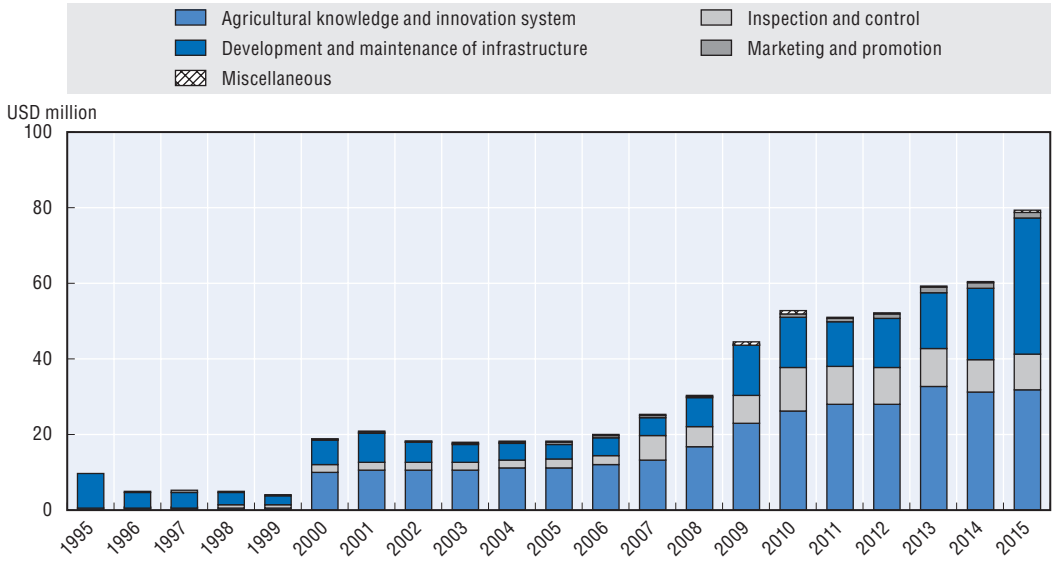
StatLink http://dx.doi.org/10.1787/888933451875

Support to general services for agriculture

In addition to support provided to producers individually, the agricultural sector is assisted through the **financing of activities that provide general benefits**, such as agricultural research and development, training, inspection, marketing and promotion, and public stockholding. The General Services Support Estimate (GSSE) indicator measures this support. The provision of common – as opposed to individual – benefit is what distinguishes the general services support from that measured by the PSE. Expenditures on general services for agriculture in Costa Rica constitute 80% of total budgetary expenditures on the sector,

considerably above the OECD average of 20%. For the period 2013-15, about 48% of total GSSE outlays were allocated to agricultural knowledge and innovation systems (more specifically, 33% to extension services and 15% to R&D). Development and maintenance of infrastructure (in particular, irrigation and farm restructuring) accounted for 32% of total GSSE outlays, and inspection and control services accounted for 14%. Together, these three categories represent 94% of the total GSSE budget (Figure 2.14).

Figure 2.14. **Level and composition of General Services Support Estimate (GSSE) in Costa Rica, 1995-2015**



Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

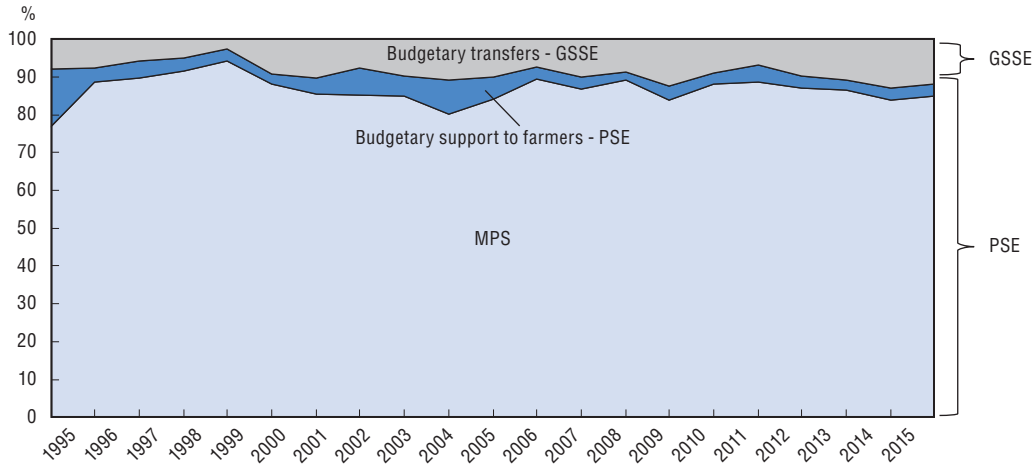
StatLink http://dx.doi.org/10.1787/888933451884

Support provided to the agricultural sector as a whole

The Total Support Estimate (TSE) is the broadest indicator of support, representing the **sum of transfers to agricultural producers** both individually (PSE) and collectively (GSSE), in addition to direct budgetary transfers to consumers. Expressed as a percentage of GDP, the percentage TSE (%TSE) provides an indication of the cost that support to the agricultural sector places on the overall economy. Its value depends on the degree to which the agricultural sector is supported in a country, the size of this sector and its importance relative to the overall economy. Figure 2.15 shows the composition of the TSE for the period 1995-2015, where levels of MPS have contributed the most (85%), and where budgetary transfers have been relatively small (15%). Of the budgetary transfers, GSSE is the predominant category, at 80%. The share of general services in TSE at 12% is in line with the average for OECD countries (12%) (OECD, 2016c).

The level of total support (TSE) provided to agriculture in the 2013-15 period was the equivalent of 1.1% of GDP, twice the OECD average of 0.66%. This is lower than in Indonesia, China, Turkey, Korea or Colombia, but much higher than in Chile, Mexico or Brazil. Costa Rica's total agricultural support represents a significant cost to the economy and society as a whole (Figure 2.16).

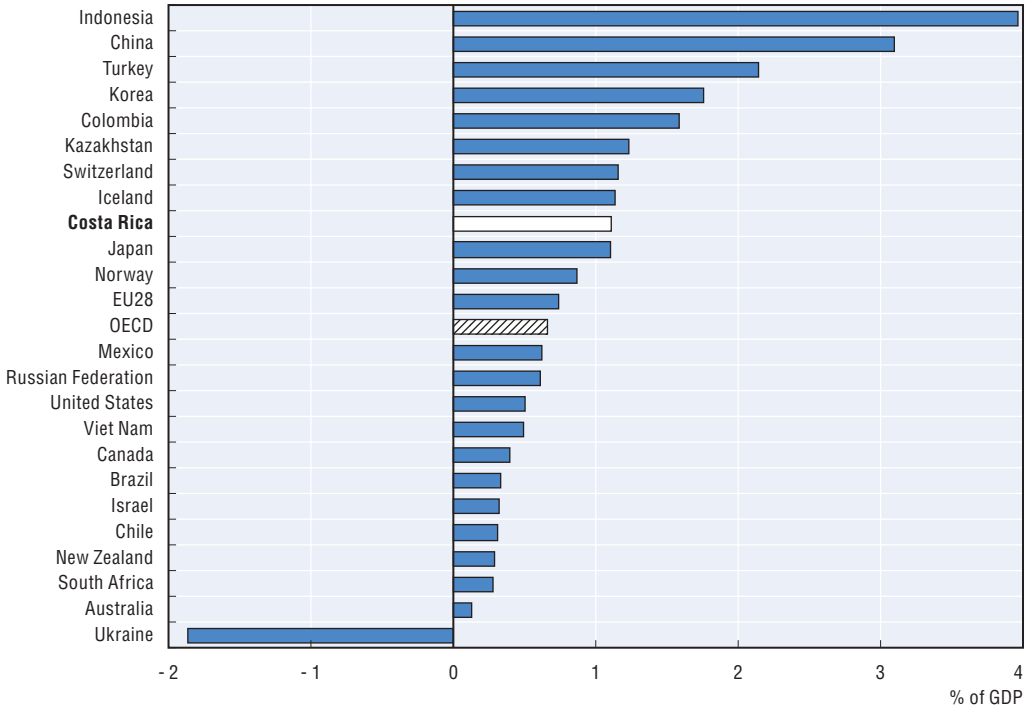
Figure 2.15. **Level and composition of Total Support Estimate (TSE) in Costa Rica, 1995-2015**



Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451891

Figure 2.16. **Total Support Estimate in Costa Rica and selected countries, 2013-15**



Note: 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.

Source: OECD (2016a), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933451902

2.6. Summary and policy issues

- Costa Rica's agricultural policies from the 1960s to the 1980s – as elsewhere in Latin America – followed a policy of **import substitution**. However, since the mid-1980s, agricultural support policies have evolved in line with Costa Rica's outward-oriented growth strategy. The level of state intervention in the markets has significantly declined,

and the country has undertaken major agricultural reforms, moving from an import substitution to a **trade liberalisation** model. The main policy objectives in the agricultural and food sectors during this period were the growth and strengthening of agricultural exports via, for example, the diversification of products and the development of destination markets. Since the food price crisis of 2007-08, **food security** has also become an important objective, and specific strategies have been developed to increase the productivity of main staples – particularly in the case of small-scale farms – while continuing to emphasise export-oriented agriculture.

- **Key objectives for the agricultural sector** under the policy framework for 2015-18 are to support the national goal of **reducing poverty** though actions that improve living conditions in rural areas, and to increase the value-added in agriculture through the **improvement of productivity and rural sustainability**. These objectives contain five pillars that encompass: (i) food security, sovereignty and nutrition; (ii) opportunities for agricultural and rural youth; (iii) rural territorial development; (iv) adaptation and mitigation of climate change; and (v) strengthening of the export sub-sector.
- The **institutional arrangements** for the agricultural sector are complex. The Costa Rican Agricultural Public Sector (APS) is composed of several institutions, including the Ministry of Agriculture and Livestock (MAG). MAG is in charge of the design and implementation of agricultural policies in co-ordination with all APS institutions; however, **co-ordination** between the MAG and the 15 institutions that belong to the APS is weak. This fragmented institutional structure impedes the alignment of actions, guidelines and even policy objectives. In some cases, it is also resulting in overlapping tasks and increasing transaction costs, e.g. for the registration of inputs and agrochemicals. These co-ordination issues have developed, in part, because some of the institutions were established by laws defining their objectives, functions and management, which limits flexibility; and partly because they generate their own resources from the sale of their services, thus gaining relative independence. MAG consequently struggles to efficiently co-ordinate the numerous institutions of the APS. Overall, the complex organisational structure of the sector, with its fragmented authority and dispersed responsibility, coupled with rigidities from institutional mandates created by law, poses challenges for the implementation of substantive reforms.
- In addition to the APS, a wide range of sectoral and **public-private bodies** operate within the Costa Rican agricultural sector. Some, such as *corporaciones* ("corporations"), have had positive impacts in the coffee and banana sectors, particularly with regard to the development of the supply chain, the provision of research and technical assistance or extension services and product marketing. While initially created with some government support, these organisations are currently financed solely by their members.
- Corporations have an important role in the negotiation of policies and the provision of services to agriculture, and some have been responsible for the implementation of public agricultural policies, such as the coffee programmes implemented by ICAFE. However, other corporations, which also provide services to their farmers, have contributed to concentrated market structures and limited **competition**. This is the case, for example, in the sugar and rice sectors. According to Law 7818, LAICA, the sugar producer association, can regulate all activities involved in the supply chain, from the purchase, import, export, storage to the commercialisation at retail level of sugar in Costa Rica. The same situation is observed in the rice sector: CONARROZ (Law 8285) fully controls the rice market. This

lack of competition impedes the competitiveness of the sectors and reduces opportunities for smallholder producers.

- Only a small allocation within the **budgetary distribution** is devoted to agricultural innovation systems, technology transfer and technical assistance programmes (INTA), while resources for agricultural infrastructure, market information systems and a strategic information system for the sector are very limited. Moreover, the absence of systematic impact assessments of public expenditures in agriculture – particularly in the provision of services – makes it difficult to determine whether the budget is being allocated to those areas in which it has the greatest impact. Finally, investment levels in the agricultural sector have been further constrained by the intensification of budgetary restrictions since 2013, in line with Costa Rica's fiscal situation.
- In addition, low levels of **budget execution** by some institutions are contributing to broader **challenges in implementation**. The problem is explained, in part, by the timeframe of national budget planning and the late receipt of resources by certain institutions. Implementation is also hampered by weak co-ordination and heavy bureaucracy among public agencies, resulting in some programmes not being implemented on time or indeed not at all, as is the case for some INDER programmes. Services provided to farmers are limited and not always timely.
- MAG and some of its affiliated institutions also suffer from a growing **deficit in technical capacity**, especially due to an ageing workforce and the non-renewal of contracts for technical positions. Extension services, for instance, lack people that have been well-trained in new issues. They also suffer from limited co-ordination between R&D, knowledge generation and farmers' needs.
- The creation of the **Banking Development System** in 2008 has injected significant financial resources into the sector. Nevertheless, bank financing remains insufficient, and the involvement of private commercial banks continues to be limited. A**gricultural insurance** – provided by the state insurance institution (INS) – remains limited, notwithstanding recent efforts to expand it in 2015. Despite the opening of the insurance market, the participation of private insurers remains virtually non-existent. Implicit subsidies provided through the zero profit mandate imposed on any agricultural transaction by the INS were abolished in 2015.
- Costa Rica has also continued to strengthen its infrastructure and institutional capacity to implement **sanitary and phytosanitary (SPS) measures**, with the aim of facilitating trade while protecting the country from pests and diseases. However, recent measures on imports of potatoes and avocados have been criticised by the trading partners concerned and ensuring co-ordination among institutions involved in the SPS measures remains important.
- Costa Rica has made considerable efforts to **liberalise its trade**. Costa Rica currently has 14 FTAs in force with 50 trading partners, both bilaterally and as a member of the Central American Common Market (CACM). These agreements include Costa Rica's largest trading partners – the United States, European Union and China – and cover almost 93.4% of its exports and almost 83% of imports. Several agricultural products – such as rice, poultry, dairy products and sugar – are excluded from most, but not all, agreements. Where they are included, they tend to be subject to special treatment, such as extended phase-outs of protection or grace periods, although these are due to end by 2025 (CAFTA-DR) or 2027 (European Union) at latest. Agricultural products are mainly imported duty-free (38%), or

with tariffs of lower than 15% (51%). However, remaining tariffs on agricultural imports are amongst the highest; with applied MFN tariff of 151% for poultry, 66% for dairy products, 46% for both pork meat and sugar and 36% for rice, among others.

- Costa Rica's **preferential treatment of rice producers**, which consists of tariffs and a reference price, does not appear to be contributing towards the objectives of helping to address rural poverty and ensuring food security. Beneficiaries tend to be relatively few farmers and rice millers, while consumers – including the impoverished rice farmers that are in fact net buyers of rice, and rural poor populations – are obliged to pay considerably more than international prices for an important staple.
- The level of **producer support**, as measured by the Producer Support Estimate (PSE), generated an average of 10.1% of gross receipts of agricultural producers in 2013-15. This level is lower than OECD average (17.5%), but higher than levels for Brazil, Chile, Mexico or the United States.
- Producer support is predominantly based on the most distorting form of support, **market price support (MPS)**, which accounts for 97% of the PSE in 2013-15. MPS is mostly due to the reference minimum price given to rice, and to tariffs applied to key agricultural products (including rice, poultry, sugar and pigmeat). These three products contribute the most to the MPS.
- Whereas market price support is high, **input subsidies** are low and destined to mostly small-scale famers for fixed capital formation, on-farm services, and payments based on environmental criteria. Relatively small implicit subsidies are also provided through preferential interest rates.
- Around 80% of total expenditures are provided to **general services to the sector** (GSSE). This is the least-distorting form of agricultural support, as it is not linked to production or input use, and the benefits flow to the sector as a whole as opposed to individuals. Outlays on agricultural knowledge and innovation systems (49%), mostly on extension services (33%); the development and maintenance of infrastructure (34%), particularly irrigation and rural roads; and animal and plant health inspection and control (14%) all dominate the GSSE.
- The average percentage **Consumer Support Estimate** (CSE%) in Costa Rica in 2013-15 was equivalent to -20.6%, indicating that policies to support agricultural prices increased consumption expenditure by 20.6% in aggregate. Consumers of agricultural products are therefore taxed through high domestic agricultural prices.
- Finally, the total value of transfers arising from support to agriculture in Costa Rica was equivalent to 1.1% of GDP in 2013-15. The OECD average for the same period was around 0.66%. National agricultural policies – market price support in particular – therefore impose a significant burden on the Costa Rican economy.

Notes

1. The policies concerned also fall under the responsibility responsibilities of other ministries such as Health, Education, Housing, Transport, etc.
2. Specific goals on increasing both yields and the contribution of agriculture to the economy are included within this plan (Annex 2A1B).
3. The definition of food sovereignty used in the Costa Rican policy framework (p. 23) is: "*La soberanía alimentaria será entendida como el derecho que tiene el país de definir sus propias políticas y estrategias de producción sostenible, distribución, acceso, consumo y utilización biológica de los alimentos; así como promover*

legislación que garantiza el acceso a los recursos de producción para la pequeña y mediana agricultura; esto da prioridad a la producción nacional para la demanda local, respetando la diversidad cultural y la conservación de los sistemas productivos y la diversidad biológica. Para lograr este objetivo, el gobierno propone una política de fuerte apoyo a la pequeña y mediana agricultura productora de alimentos". [Food sovereignty will be understood as the right of the country to define its own policies and strategies for the sustainable production, distribution, access, consumption and biological utilisation of food; and to promote legislation guaranteeing access to productive resources for small and medium agriculture; this prioritises national production for domestic demand, respecting cultural diversity and the conservation of productive systems and biodiversity. To achieve this goal, the government proposes a policy of strong support for small and medium-scale agriculture]. This definition is adapted from the FAO definition (SEPSA, 2015a).

4. An overview of the policy guidelines and strategic areas is provided in Annex 2.A1.B and Annex 2.A1.C.

5. The Ministry of Agriculture (MAG) was created by Law No. 2656 of 1960, but its institutional history dates from the 19th century. Among its functions are: the design of sectoral policies, promotion of productivity and the competitiveness of agricultural production; formulation and implementation of information processes and technology advice; and the promotion of modernisation and adoption of new technologies.

6. This total includes MAG itself.

7. Within MAG's institutional framework, the National Commission for Agricultural Research and Technology Transfer (CONITTA) and the Foundation for the Development and Promotion of Research and Transfer of Agro-Technology (FITTACORI) created the National System of Agricultural Research and Technology Transfer (SNITTA). This system aims to function as the financial arm to support projects related to research, technology transfer, training and dissemination of agricultural technology in the country. FITTACORI resources finance joint research agendas independent of the corporations between INTA and other entities, such as universities and research centres.

8. CAN includes the Minister for Agriculture, who chairs; the CNP Executive Chairman; the INDER Executive President; the Executive President of the Central Bank of Costa Rica (BCCR); the Minister for National Planning and Economic Policy (MIDEPLAN), the CEO of the National Bank of Costa Rica (BNCR), the INTA Executive Director, the SENASA Executive Director, the SFE Executive Director, and the SEPSA CEO.

9. The Minister for Agriculture delegates participation in several Boards to his or her vice-ministers. There are two ways to exercise stewardship, depending on the type of institution concerned. In the affiliated institutions, there is a direct reliance on the minister (e.g. at SFE or SENASA) to chair the Board of Directors. In the decentralised institutions, the minister participates in the Board and the development of the annual plans of these institutions, which are reviewed and approved by SEPSA.

10. These are ICAFE (coffee), LAICA (sugar), CORFOGA (livestock), CONARROZ (rice). The Minister for Agriculture – in his role as President of the APS – is also a member of the majority of the Boards of Directors of the agricultural decentralised institutions. The minister plays an important role in organisations related to the most relevant Costa Rican agricultural products. These private institutions are governed by public law.

11. Between 2008 and 2010, the government implemented the "National Food Plan" (*Plan National de Alimentos 2008-2010*). The plan included several measures – such as the provision of additional budgetary resources in the form of transfers and increased spending limits for some institutions – which resulted in the provision of additional services and some subsidies to farmers, rice producers in particular, in addition to the minimum prices and tariffs. Rice production also increased as a consequence of high international prices that, when transmitted to domestic prices, motivated farmers to produce more rice (SEPSA, 2016a).

12. The SBD is sourced through three funds: The National Trust for Development (Fideicomiso Nacional para el Desarrollo, FINADE), which derives its funds from the national budget; the Credit Fund for Development (Fondo de Crédito para el Desarrollo, FCD), which is financed by 17% of current account deposits of private banks; and the National Development Fund (FOFIDE), which receives 5% of public bank profits.

13. This rough estimation was based on the total number of farms registered in the agricultural census in 2014 and the average loan allocated by SBD in 2015.

14. SAPs were signed with the World Bank and subsequently supplemented by agreements with the International Monetary Fund (IMF) and the United States Agency for International Development (USAID).

15. Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.
16. Reported to the WTO Import Licensing Committee. WTO documents: G/LIC/N/2/CRI/2, on 20 October 2010; G/LIC/N/3/CRI/7, on 14 October 2010; and G/LIC/N/3/CRI/6, on 9 October 2009. The 27 products are: pigmeat; pieces and offal of poultry; birds not cut in pieces; fluid milk; milk powder; evaporated milk; condensed milk; yogurt and buttermilk; whey; butter and fats; fresh cheese and processed cheese; dehydrated cheddar cheese; other grated cheeses; blue cheese; other cheeses; eggs; common beans; yellow corn; white corn; rice; lard; poultry sausages; pigmeat preparations; sugar; ice creams; tobacco and jute fabrics.
17. Executive Decree No. 30900-COMEX-MAG, 20 December 2002, amended by the Executive Decrees No. 32237 of 2005, No. 35617 of 2009 and No. 36619 of 2011.
18. SFE is working on the final version of the analysis of pest risk for importation of Hass avocados from Mexico, taking into account information and comments received during the period given in the notification G/SPS/N/CRI/162. This review includes analysis of different options that would allow trade while guaranteeing the protection of national phytosanitary status.

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ANNEX 2.A1.A

Policy guidelines and strategic areas in the agricultural sector, 2015-18

Areas	Presidential Election Cycle					
	1990-94	1994-98	1998-2002	2002-06	2006-10*	2010-14
Trade Liberalisation	• Integration into national, regional and international trade processes	• International co-operation and investment promotion aimed at economic and social objectives	• Competitiveness	• Competitiveness	• Competitiveness and generation of added value • Sustained increase in export supply • New marketing opportunities	• Competitiveness in agricultural chains • Facilitation of agribusiness • Efficient management of markets • Infrastructure to support production • Funding and insurance • Health • Information Communication Technology (ICT) Management
Productive Promotion	• Modernisation of productive activities for domestic consumption and export	• Productive Reconversion Programme	• Productive Reconversion • Information (InfoAgro, Web platform)	• Boost for rural agribusiness. • Agricultural information, quality and safety	• Business climate to allow producers and SMEs to successfully articulate to markets	• Innovation and technological development • Development of capacities for innovation
Institutional Reform	• Institutional modernisation • Strengthening of private participation	• Institutional modernisation for efficient public management • Integration of services	• Institutional modernisation of the agricultural sector and rural area	• Joint Forum • Modernisation of institutional services	• Institutional modernisation for greater efficiency	• Any objective
Rural Development	• Continuous improvement of farmers' living standards • Marginalised sectors' participation in production processes.	• Rural Development Programme	• Strengthening and development of rural areas • Social organisations and co-management	• Land planning and settlement development. • Women and men producers • Rural Youth • Development of Indigenous territories	• Promotion of local projects with high added value and jobs	• Rural Territories Management • Family Farming • Rural Economy of the territories
Natural Resources	• Sustainable exploitation of natural resources	• Any objective	• Any objective	• Ecosystem management and biodiversity use • Irrigation and Drainage • Reduction of vulnerability	• Comprehensive management of sustainable production	• Climate change and agro-environmental management
Management	..	• HR Training. • Sectoral co-ordination to improve efficiency	• Strengthening of HR.	..	..	..

Source: SEPSA (2015b).

ANNEX 2.A1.B

Policy guidelines and strategic areas in the agricultural sector, 2015-18

Strategic areas and specific actions were established for each of the following policy guidelines, or "pillars", of the policy framework for the 2015-18 period, "Policies for the Agricultural Sector and Rural Territorial Development 2015-2018":

- Pillar 1: *Food Sovereignty and Food and Nutrition Security*. a) Improve productivity, marketing and the generation of added value for the basic agricultural products that are consumed, by providing goods and services to improve the living conditions of small and medium-scale producers, and b) promote projects and productive entrepreneurship in non-traditional and autochthonous activities, with added value as nutritional and income generation and employment alternatives. Several specific goals to increase yields were set for main crops such as rice (from 3.8 tonnes/ha to 5.2), beans (from 0.7 tonnes/ha to 0.92), maize (from 2.5 tonnes/ha to 3.2), milk (from 28.1 kg/day/animal to 36.3), beef (from 146 kg/ha/year to 189.6 kg/ha/year), pigmeat (from 16.8 piglets/animal/year to 21.8), potatoes (from 25 tonnes/ha to 26.5) and onions (from 23 tonnes/ha to 24.4). Furthermore, a goal of increasing the agriculture's contribution to GDP by 2%, from 6% in 2014 to 8% in 2018, was also established.
- Pillar 2: *Opportunities for agricultural and rural youth*. Pillar 2 provides approaches to address the double exclusion problem of the rural youth – education and employment – and sets the objective of the development of capacities for the creation of employment and entrepreneurship opportunities for young people (SEPSA, 2014).
- Pillar 3: *Rural Territorial Development*. Pillar 3 aims to promote the integration of the rural population into the dynamics of the country's territorial development with investment projects that generate added value to the agricultural sector in order to improve the quality of life in rural areas.
- Pillar 4: *Adaptation and mitigation of Climate Change in Agriculture (MICCA)*. This pillar is intended to meet the commitments resulting from COP20 (Lima, 2014) and the recommendations of Rio+20 (Brazil, 2012) that acknowledge the effects of greenhouse gas (GHG) emissions on climate change and its implications for sustainable development and food security.
- Pillar 5: *Strengthening the agricultural export sector*. This pillar reflects the importance of past structural changes in Costa Rica and the relevance given to open markets, particularly in the agricultural sector. It recognises that the process of economic opening should be oriented towards increasing the level of welfare of its producers and consumers. As such, the pillar's strategic objective is to "improve aspects of productivity, quality, traceability, safety and compliance with social and environmental standards of existing and potential exportable products that allow better market positioning" (SEPSA, 2014).

ANNEX 2.A1.C

Policy guidelines and strategic areas in the agricultural sector, 2015-18

Pillar 1
Food Sovereignty and Food and Nutrition Security
Improve productivity, marketing and generation of added value and promote projects and the productive entrepreneurship in non-traditional activities with added value

- Increase of production and productivity with added value
- Availability and use of seeds and genetic material of superior quality
- Improvement of the local marketing process to improve market access
- Research, technological transfer, extension and innovation
- Support of national production and public health
- Conservation and use of Plant Genetic Resources (PGR) and Animal Genetic Resources (AnGR)
- Knowledge management

Pillar 2
Opportunities for agricultural and rural youth:
Develop the capacities for the creation of employment and entrepreneurship opportunities for young people

- Increased awareness of exclusion of young people from different areas of rural communities
- Capacity building for human development, especially within associations and youth organisations
- Human capital formation in technical schools to allow young people to access quality jobs or productive enterprises
- Access to public goods and factors of production to develop entrepreneurship and quality jobs
- Inter-sectorial co-ordination to respond to demands of rural young people for goods and services of other sectors

Pillar 3
Rural Territorial Development
Integrate the rural population

- Development and implementation of capacities for entrepreneurship and better jobs
- Inter-sectorial co-ordination for access to goods and services to enable rural development
- Human development and social inclusion in rural territories
- Promote productive linkages and value chains based on the potential of the rural territories

Pillar 4
Mitigation of Climate Changein Agriculture (MICCA)
Meet the commitments resulting from COP20 and the recommendations of Rio+20

- Actions to adjust production processes to climate change
- Mitigation of climate change by the agricultural and rural sector
- Promotion of green businesses
- Integrated risk management

Pillar 5
Strengthening the agricultural export sector
Improve aspects of productivity, quality, traceability, safety and compliance with social and environmental standards of existing and potential exportable products that allow a better market positioning

- Creation of spaces for the definition and treatment of union level strategic actions
- Research, innovation and technology transfer for exportable products
- Credits
- Co-ordination with the Ministry of Foreign Trade (COMEX) for the administration of existing trade agreements and for finding new niche markets

Source: SEPSA (2015a).

ANNEX 2.A2

Description of agricultural institutions

Institutions are under direct control of the Ministry for Agriculture (MAG)

The ***National Seed Office*** **(ONS)** was created in 1978 (Law No. 6289), and is responsible for promoting the production and use of quality seeds for agricultural production, and for setting standards and control mechanisms for seed certifications and trade. Subsequently, Law No. 8631 for the Protection of New Varieties of Plants, and Law No. 8539 for accession to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) were approved. The ONS receives its income from the state (41.7% in the 2015 budget); and from the sale of services (48.2% in 2015), such as the issuing of seed certifications, verification of quality standards for imported seeds, the maintenance of import and export records, and the registration of users.

The ***State Phytosanitary Service*** **(SFE)** was established in 1997 to manage and regulate agricultural trade, and to avoid and prevent plant pests and threats to food security. It ensures compliance with the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement), preventing barriers to trade; and provides access to information and import and export requirements for chemicals; laboratory analysis; and accreditation for certifiers, genetically modified organisms (GMOs) and wooden packaging.

The ***National Institute for Agricultural Innovation and Technology Transfer*** **(INTA)** was created in 2001 to generate and adopt technologies aimed at increasing the productivity and competitiveness of production systems and the sustainability of agricultural and natural resources. In addition, it contributes to increasing technology adoption in agriculture, through technology transfers. The priorities for the 2014-18 period are sensitive products, basic foods and climate change.

National Animal Health Service **(SENASA)**, created in 2006, preserves, promotes, protects and restores animal health, and regulates and controls the safety of food of animal origin for consumers. It furthermore registers, regulates and supervises veterinary medicines and animal feeds. Finally, SENASA strives for compliance with and implementation of the various international agreements.

National Council Club 4-S (Law No. 2680, 1960) is a unit attached to the Ministry of Agriculture and Livestock which is in charge of co-ordination with organisations that develop civil participation and the self-improvement of rural children, youth and women.

Decentralised institutions

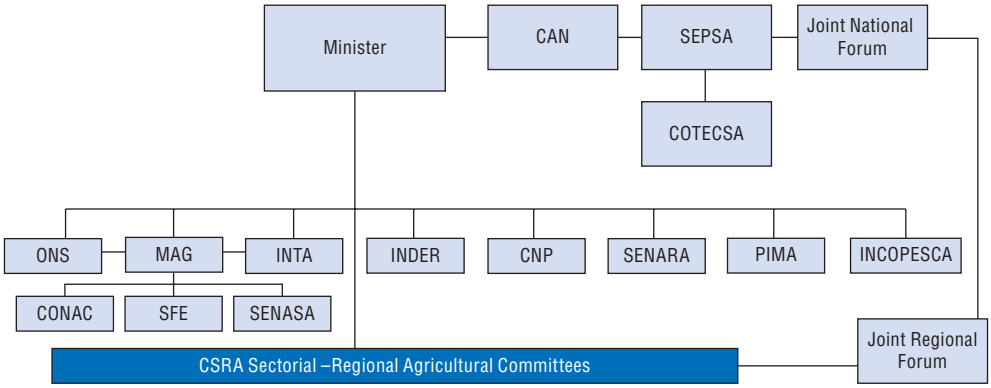
The ***National Production Council*** (CNP) was created in 1956 under Law No. 2053. Its objective is "the promotion of agricultural and industrial production, as well as the price stabilisation of items required for the food security of the country's population and the raw materials required for the domestic industry" (CNP, 2014). Initially, CNP was a state tool for food security and guaranteed, through support prices, a secure market for small producers of corn, rice, beans and sorghum. It also owned public infrastructure for the collection, storage, transport and distribution of grain production. These functions were abandoned during the trade liberalisation period. Today, CNP focuses on the provision of support to agribusiness development and the management of the Institutional Supply Programme (PAI) that purchases food from small domestic producers for consumption in hospitals, schools, prisons and Public Nutrition Centres. The council is financed by 50% of the profits of Costa Rica's National Liquor Factory (FANAL) and state transfers.

Institute of Rural Development (INDER) was created in 2012 by Law No. 9036, from the former Institute of Agrarian Development (IDA) that implemented the state policy for rural development in order to establish an institutional framework for sustainable rural development. INDER's responsibilities are: a) Land management and regulation, for which it acquires, allocates and titles farmland, and supports rural settlements; and b) Territorial development management, for which it carries out infrastructure and social and rural management projects. INDER furthermore promotes the establishment of the ***Regional Boards of Territorial Development*** (CTDR), which elaborate development plans for specific areas.

The ***National Groundwater, Irrigation and Drainage Service*** (SENARA) was created in 1983 in order to develop and implement policies for the use and distribution of water for agricultural purposes. Its priorities are the management of the *Arenal-Tempisque Irrigation District* (DRAT) (30 000 ha), irrigation programmes for small areas (PARD), drainage and flood control, as well as groundwater management.

The objective of the ***Comprehensive Agricultural Marketing Programme*** (PIMA) (Law No. 6142 of 1977) is to promote and contribute to food system improvements through the development and sale of services for marketing agricultural products. The programme is aimed at marketing agents in order to meet the needs of customers involved in the agro-food chain, and thus contribute to Costa Rican food security. PIMA manages the ***National Centre for Food Supply and Distribution*** (CENADA) – a wholesale distribution market – and the Cold Chain and the Market Information System (SIMM). PIMA also promotes the creation of regional wholesale markets.

Figure 2.A2.1. **Organigramme of the Agricultural Public Sector in Costa Rica**



Source: SEPSA (2014).

ANNEX 2.A3

Most favoured nation (MFN) tariff structure, 2006 and 2014

Lines	2006 (HS02)	2014 (HS12)
Total number of lines	8 840	10 065
Non-*ad valorem* tariffs (% of all tariff lines)	-	-
Tariff quotas (% of all tariff lines)[1]	1.0 (0.4)	1.5 (0.5)
Duty-free tariff lines (% of all tariff lines)	2.7	2.8
Average of lines exceeding zero (%)	7.1	7.1
Arithmetic average	6.9	6.9
Agricultural products	14.2	14.0
Non-agricultural products (including petroleum)	5.6	5.5
Agriculture, hunting and fishing (ISIC 1)	9.2	9.6
Mining (ISIC 2)	3.2	2.9
Manufacturing (ISIC 3)	6.8	6.7
Raw materials	7.6	8.4
Semi-processed products	4.4	4.4
Processed products	8.2	7.9
Domestic tariff "peaks" (% of all tariff lines)[1]	1.4	1.5
International tariff "peaks" (% of all tariff lines)[2]	1.4	1.5
Overall standard deviation of applied rates	9.5	9.6
"Nuisance" rates applied (% of all tariff lines)[3]	48.9	47.7
Bound tariff lines (% of all tariff lines)	100.0	100.0

1. Domestic tariff peaks are defined as rates exceeding three times the overall simple average of applied rates.
2. International tariff peaks are defined as rates above 15%.
3. "Nuisance" rates exceed zero but are 2% or less.
Source: COMEX (2015).

ANNEX 2.A4

Summary of main free trade agreements: Periods and exceptions

CAFTA - DR	• Costa Rica granted immediate free trade to 68.5% of the subsections in the agricultural sector • An additional 23.5% of tariffs will be phased out within the next 15 years. • For the most sensitive products, longer phasing- out periods (20 years), grace periods or nonlinear concessions were agreed. • Only potatoes and fresh onions were excluded from the preferences. • Tax relief began in 2006. • In 2025, all agricultural products will have a zero tariff, with the exception of potatoes and onions. • Longest tariff phase-out will reach duty free in 2025. 2020 is the year when 15 years tariff-out phase would be duty free.	**Pork** Phasing out: 15 years Grace period of 6 years Start of liberalisation: 7th year (2012), in nine equal annual stages. Duty-free access within tariff quota is granted. Duty-free by 2020. **Dairy** Phasing out: 20 years Grace period of 10 years Start of liberalisation: 11th year (2016), in ten equal annual stages. Duty-free access within tariff quota for milk powder, butter, cheese, ice cream, milk-based drinks is granted. Duty-free by 2025. **Chicken legs** Phasing out: 17 years Grace period of 10 years Start of liberalisation: 11th year (2016), in 7 annual non-linear stages. Duty-free access within tariff quota is granted. Duty-free by 2022. **Rice** Phasing out: 20 years Grace period of 10 years Tariff liberalisation from 11th year, in 10 annual nonlinear stages. Duty-free access within tariff quotas (one for paddy rice, one for milled) is granted. Duty-free by 2025.
Canada	• Currently, 88% of agricultural subsections enjoy preferential tariff of 0% under this agreement. This is the current status of liberalisation. • The longest term negotiated (15 years) reached free trade from 1 January 2016 onward. • 10% of agricultural products in general are excluded from the preferences of the agreement. • An additional 2% will have preferential access in the form of contingents (wheat flour, vegetable oils derived from soybeans and other oilseeds). Imports that are outside the quota maintain the MFN tariff.	**Excluded products** Beef, pork, poultry sector, dairy products, potato, tomato, onions, beans, rice, poultry sausages, prepared beans (Cap. 20). Tariff-free access within quota is granted for pork and milk powder (under the WTO quota).

Chile	• With the exception of the excluded products, all agricultural products are subject to preferential tariff of 0% under the FTA with Chile. • The longest term negotiated (16 years) reached free trade from 1 January 2015 onwards.	**Excluded products** Poultry sector (including eggs), dairy products (except condensed and evaporated milk), vegetables (except sweet corn), wheat flour, soybeans and derivatives, vegetable oils (except palm oil), poultry sausages and meat preparations, onions, potatoes and prepared beans (Cap. 20), raw and refined sugar.
Peru	• This treaty is in its third year of operation. In 2013, tariffs were removed from 64% of agricultural subsections. • 7% will be further liberalised from 1 January 2017 (5-year phase-out period) and an additional 10% from 2022 (10-year phase-out). • 10% of subsections reach free trade within a maximum period of 15 years (1 January 2027). • The remaining 9% will be excluded from the preferences of the agreement.	**Products of 15-year phase-out** Fresh chicken, white corn, cornmeal, refined oils (soybean, olive, palm, rapeseed), sausages and meat preparations, sauces and similar preparations. **Excluded products:** Beef, pork, frozen chicken, dairy products, potato, tomato, onion, beans, coffee, rice, raw and refined sugar, unfilled pasta, beer, and animal feed.
European Union	• This treaty has a unique list from Central America and the European Union. For some products, it starts from a virtual tariff (the highest tariff level applied between the countries in the region). This creates a grace period during which the country with the lowest tariff is not affected by the tax relief. • The longest phasing-out period agreed is 15 years, which will be reached in 2027. • 30% of subsections are already subject to free tariff. • 39% will liberalised within up to 15 years. • The remaining 31% are excluded from the preferences of the agreement.	**Excluded products** Beef and edible offal; pork meat and edible offal; sector poultry (including eggs); dairy products; natural honey; potato, onion, tomato; beans; spice mixtures; corn (except pop type); rice, sorghum; wheat flour; soybeans; vegetable oils; sausages; sugar, raw and refined; sweets; cereals and bakery products, biscuits; fruit juices; sauces and similar preparations; ethyl alcohol; rum; animal feed; cigarettes and tobacco. **Duty-free access within the quota** is granted for milk powder, cheeses, bacon and cured hams, and prepared pork (these last two instalments are regional).
Mexico	• With the exception of the excluded products, all agricultural products already enjoy a preferential tariff of 0% under the FTA with Mexico. • During the negotiations with Central America, some raw materials for the food industry (custard powder and yogurt powder), poultry sausages, jams and jellies were liberalised.	**Excluded products** Poultry sector (including eggs); dairy products (except sour cream and yogurt powder); potatoes and onions; bananas; coffee; poultry meats and preparations; raw and refined sugars; other sugars; ethyl alcohol, cigars and tobacco.

Source: COMEX (2015).

ANNEX 2.A5

PSE CROPS

Rice. Costa Rica is a net importer of rice. The United States is its main supplier, with a preferential tariff (36%) under quota. Imports are concentrated in paddy rice, and account for 40% of national consumption. Rice is grown by 4 467 producers across a total of 58 539 hectares. Around 20% of producers hold 80% of the area, demonstrating a large concentration. There are a total of 15 rice mills located near the main producing areas, especially in Guanacaste. Producers and mills are grouped under CONARROZ. The owners of the mills are also represented by ANINSA, a body focused on the interests of the rice industry (SEPSA, 2016; CONARROZ, 2016).

Pineapple. Costa Rica is a net exporter of pineapple. More than 95% of pineapple production is sold on the international market. In 2014, there were around 1 230 produces (INEC, 2014).

Banana. Costa Rica is a net exporter of bananas. Much of the Costa Rican banana production is destined for the North American market and the European Union, which are also the main export markets for pineapples. Bananas are produced by 15 924 producers across an area of 51 758 hectares. There are 12 exporters. Banana growers are organised under CORBANA, which advises the executive branch on the reference prices for bananas (FOB). The final price is established by executive decree. The last time that the minimum export price for bananas was set was on 18 March 2010 (CORBANA, 2016).

Coffee. Costa Rica is a net exporter of coffee. There are 26 527 coffee producers and 23 exporters. Around 85% of coffee produced is exported in the form of green coffee. The coffee industry operates 220 coffee mills. Coffee growers are organised under ICAFE, which issues certificates of origin and coffee quality (ICAFE, 2016).

Sugar. There are 4 880 sugar cane farms in Costa Rica; the total area planted in 2014 was 65 062 hectares. The sugar cane industry operates 15 mills, dispersed throughout the country, three of which are co-operatives. Sugar farms are represented by LAICA, which guides sugarcane production, determines quotas and administers sugar exports. LAICA also manages the sugar cane research programme, one of the most successful crop research programmes in the country. Costa Rica is an exporter of sugar, especially of high-quality raw sugar to the United States, Canada, Russia, Japan, among others. LAICA additionally fixes the annual quota of national sugar production and distribution among the mills, and manages the preferential sugar quota granted to Costa Rica under international conventions (LAICA, 2016).

Palm oil. The main destination of palm oil exports is Mexico and, to a lesser extent, Honduras, Nicaragua and Panama. Palm oil enters these markets with a tariff preference under existing trade agreements. By 2014, there were 2 169 farms and 66 420 hectares of palm oil. Most of producers are organised in co-operatives or producer associations (INEC, 2014). Four companies process the fruit. It is estimated that this activity generates 49 000 jobs. In 2015, 1 million tonnes of fresh fruit was produced, representing 250 573 tonnes of crude oil (CONAPALMA, 2016).

Cattle sector. There are a total of 37 000 farms on which cattle are raised. On 23 000 of these, cattle production is the main economic activity, according to the 2014 Census. The total cattle population is 1.3 million head in 1.5 million hectares of pasture and secondary wood lands. Around 43% of cattle farms specialise in beef production (raising and fattening), 46% fulfil a double purpose (beef and dairy), and 11% are specialised in dairy. The **dairy** sub-sector, meanwhile, includes around 128 local processors which produce between 200 and 1 000 litres per day of milk; seven mid-size processors which produce between 20 000 and 70 000 litres per day; and a large company, the Dos Pinos Co-operative, which collects around 80% of the national milk production – around one million litres per day. Around 1 400 producers are members of Dos Pinos, and 300 non-members deliver their milk to this co-operative. While the Costa Rican dairy sector is self-sufficient, small volumes of milk powder (for use in industrial processing) are mainly imported from the United States, Panama, Chile and Nicaragua. Central America and the Caribbean are the main export markets for Costa Rican dairy products such as milk, milk powder and yogurt (CAPROLE, 2016).

Costa Rica is a net exporter of **beef**, currently exporting to more than 20 markets (the United States, China and Central America). The main export product is frozen and chilled boneless meat. There are 23 slaughter houses in the country, three of which slaughter around 85% of animals. Four of these comply with USDA standards and are therefore registered for export (CORFOGA, 2016).

Pigmeat. There is a marginal trade in pork. The volume of imports represents less than 6% of domestic consumption. Imports mainly come from the US, Canada and Chile, all of which receive preferential tariffs under their respective free trade agreements. The pig sector includes two well-differentiated types of farms: six large operations and around 300 small-scale producers. This does not include farms that may have one to ten pigs. Large producers slaughter animals at beef slaughter houses which also have the necessary facilities for pigmeat. Small-scale producers meanwhile usually sell live animals to local butchers (CAPORC, 2016).

Poultry. There is a marginal trade of poultry. Imports represent 3% of national consumption. More than 50% of imports are turkey products. Around 12% is mechanically deboned meat (CDM), raw material for the sausage industry. The main supplier is the United States, which imports turkey meat, CDM chicken, chicken breasts and thighs. Chicken meat is mostly produced for domestic consumption. The poultry meat sector includes 200 hatchery farms and three plants. Plants and hatcheries operate under contract farming systems (CANAVI, 2016).

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Chapter 3

Adaptation to climate change in Costa Rica's agricultural sector

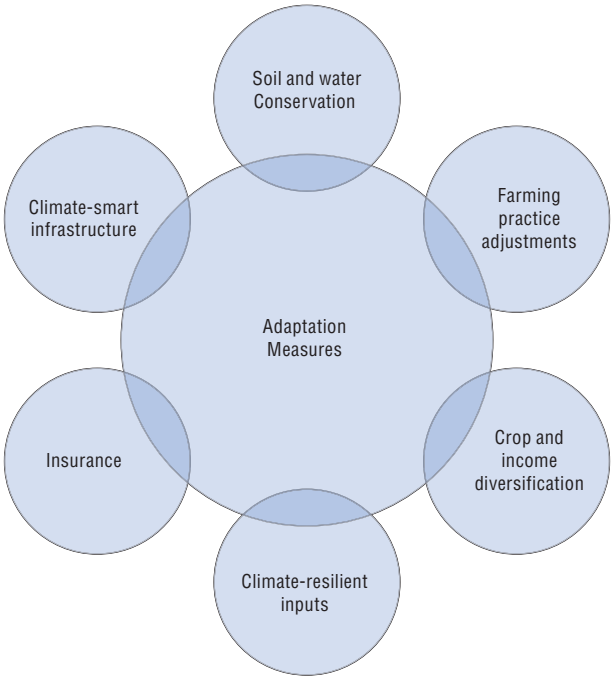
The long-term productivity of Costa Rica's agricultural sector is at serious risk from climate change. Increasingly severe floods and droughts, rising temperatures and heightened exposure to pests all threaten to compromise the sustainability of its productivity growth in the coming decades. This chapter assesses efforts by the Costa Rican government to encourage farmers to adapt to climate change. Adaptation is key to minimising the negative effects and taking advantage of new opportunities in a changing climate. The government has already taken a number of important steps to support farmer efforts to adapt. This chapter highlights progress made, and discusses opportunities to take this further through four key dimensions of adaptation policy: (i) strategic prioritisation of adaptation objectives, (ii) information generation and dissemination, (iii) rule-based regulation, and (iv) financial incentives.

3.1. Introduction

Extreme climatic events are negatively impacting agricultural productivity in Costa Rica. From 1988 to 2014, Costa Rica's agricultural sector experienced an estimated USD 461 million (2015 constant) in losses from extreme climatic events (MAG-MIDEPLAN, 2016). Climate change projections suggest that these effects will worsen as temperatures and the severity of natural hazards increase in many parts of the country. This in turn has broader implications for the economy: climate change-induced losses in agricultural production are projected to push down agriculture's contribution to GDP by between 8% and 12% by 2100, relative to 2007 GDP (Ordaz et al., 2010).[1]

Costa Rica's agricultural sector has attracted international acclaim for its efforts to help reduce the country's carbon footprint (Box 3.1) – however, given the projected impacts of climate change, adaptation is equally critical. Costa Rican farmers can minimise the negative effects of climate change – and indeed avail themselves of new opportunities – through a range of adaptation measures. Soil conservation, for instance, can help to strengthen soil quality and reduce erosion resulting from natural hazards. Climate-resilient seeds can decrease yield variability as temperatures rise and precipitation levels shift. Adjustments in farming practices – such as when and which crops are planted – can be critical to maintaining productivity. Crop diversification, income diversification and insurance can help reduce income variability. Moreover, climate-proof infrastructure can limit risk exposure (Figure 3.1).

Figure 3.1. **Examples of adaptation measures for agriculture**



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Box 3.1. **Multi-stakeholder efforts to mitigate climate change within the agricultural sector**

Costa Rica's agricultural sector is renowned for its efforts to mitigate climate change. As the second-largest contributor to greenhouse gas (GHG) emissions – representing 37% of total GHG emissions in 2005, with 4.6 million metric tonnes of CO_2 equivalent (Pomareda, 2015) – there is significant scope for the agricultural sector to help Costa Rica reach its carbon neutrality target. In recognition of this potential, the sector – often in co-operation with public and academic institutions – is actively involved in initiatives in coffee and livestock, among others, to tackle its two main contributors, nitrous oxide and methane.

Key examples of such initiatives are Nationally Appropriate Mitigation Actions (NAMAs)[1], government-led multi-stakeholder actions to reduce GHG emissions. The **Coffee NAMA** was established in 2013 to reduce nitrous oxide emissions from coffee plantations, the source of 25% of Costa Rica's GHG emissions. 25 000 hectares have been enrolled in the programme thus far, with the aim of covering 93 000 hectares by 2023 (SEPSA, 2016).

Livestock, Costa Rica's primary source of methane emissions, has also been a key focus area for several mitigation initiatives. In 2015, a **National Strategy for Low-Carbon Livestock** was initiated by the Ministry of Agriculture and Livestock (MAG), with the active participation of the private sector, in order to guide a range of mitigation efforts. In particular, a **Livestock NAMA** was launched to reduce GHG emissions through practices such as rotational grazing, pasture improvement and live fences. The programme aims to enrol 70% of all herds and 60% of the total livestock area between 2015 and 2030 (MAG, 2015).

Lastly, a number of programmes to mitigate climate change are also being developed for **other crops**. The banana sector, for instance, has reduced water and nitrogen fertiliser use by 50% in order to cut GHG emissions (CORBANA, 2015). El Viejo, Costa Rica's main sugar processing company, has also introduced emission-reducing practices on farms and in its processing plants (El Viejo, 2015).

Estimates suggest that these initiatives could collectively reduce GHG emissions by 120 000 metric tonnes of CO_2 (World Bank, 2014). These efforts represent an important step forward in Costa Rica's struggle against climate change, even more so considering the potential positive spillovers to other policy areas such as adaptation (Section 3.3.4).

1. These are in various stages of development for coffee, livestock, sugarcane, rice, and banana (World Bank, 2014).

A range of adaptation measures is already employed by many Costa Rican farmers. Due to a strong national tradition of environmental protection, sustainable development and – more recently – climate change mitigation, Costa Rican farmers are well versed in many of the linkages between agriculture and the environment and a number of agricultural practices are already adaptive. For instance, low external input agriculture, soil conservation and crop diversification are key tenets for many Costa Rican farmers (Extension Services, 2016; INTA, 2016). Moreover, some farmers have started experimenting with more resilient seed varieties,[2] while others are altering planting dates in order to adapt to changing climate conditions.[3]

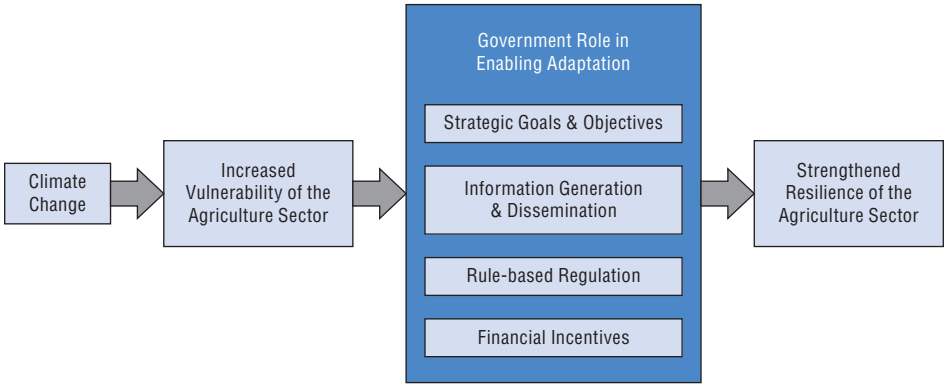
In view of Costa Rica's vulnerability to climate change, strengthening these efforts to adapt is critical for achieving the sector's broader objectives of productivity growth and poverty reduction. While many adaptive practices are undertaken by farmers, public intervention is needed to encourage adaptation in some cases (Ignaciuk, 2015a). This chapter explores recent advancements and potential opportunities for further development in Costa Rica across four

dimensions of adaptation policy: (i) strategic prioritisation, (ii) information generation and dissemination, (iii) rule-based regulations and (iv) financial incentives (Figure 3.2).

Strategic prioritisation of adaptation in key government strategies is first needed for governments to signal political commitment and direction for adaptation policy. Building on this prioritisation, a strong evidence base is then needed on the specific effects that climate change may have on the agricultural sector, and on what can be done to address these risks. This requires effective **information generation and dissemination**, both within the government itself and also externally to enable informed decision-making by farmers (OECD, 2012a; Ignaciuk, 2015a). When the provision of information about risk exposure does not motivate farmers to adapt – either due to market failures or distortions from other policies, for instance (Ignaciuk, 2015a) – maladaptive[4] behaviour can be limited by aligning **rule-based regulations** – such as standards and mandatory requirements – with adaptation. Aligning **financial incentives**, such as environmental payments and taxes, with adaptation can also help to address market failures and distortions.

As this chapter will highlight, the Costa Rican government is already making noteworthy strides across these four dimensions of adaptation policy. With an integrated approach to mitigation and adaptation – through climate actions – the agriculture sector has introduced a number of measures with potential for positive synergies across policy areas. Nevertheless, significant opportunity remains to maximise the impact of these policies through changes at the margin (in the short-term), as well as several more ambitious objectives (in the medium to long-term). Given Costa Rica's heightened exposure to climate change (Section 3.2), the Costa Rican government requested an in-depth look at the agriculture sector's adaptation policy to identify opportunities for greater impact (Section 3.3).

Figure 3.2. **The role of governments in enabling adaptation of the agricultural sector**

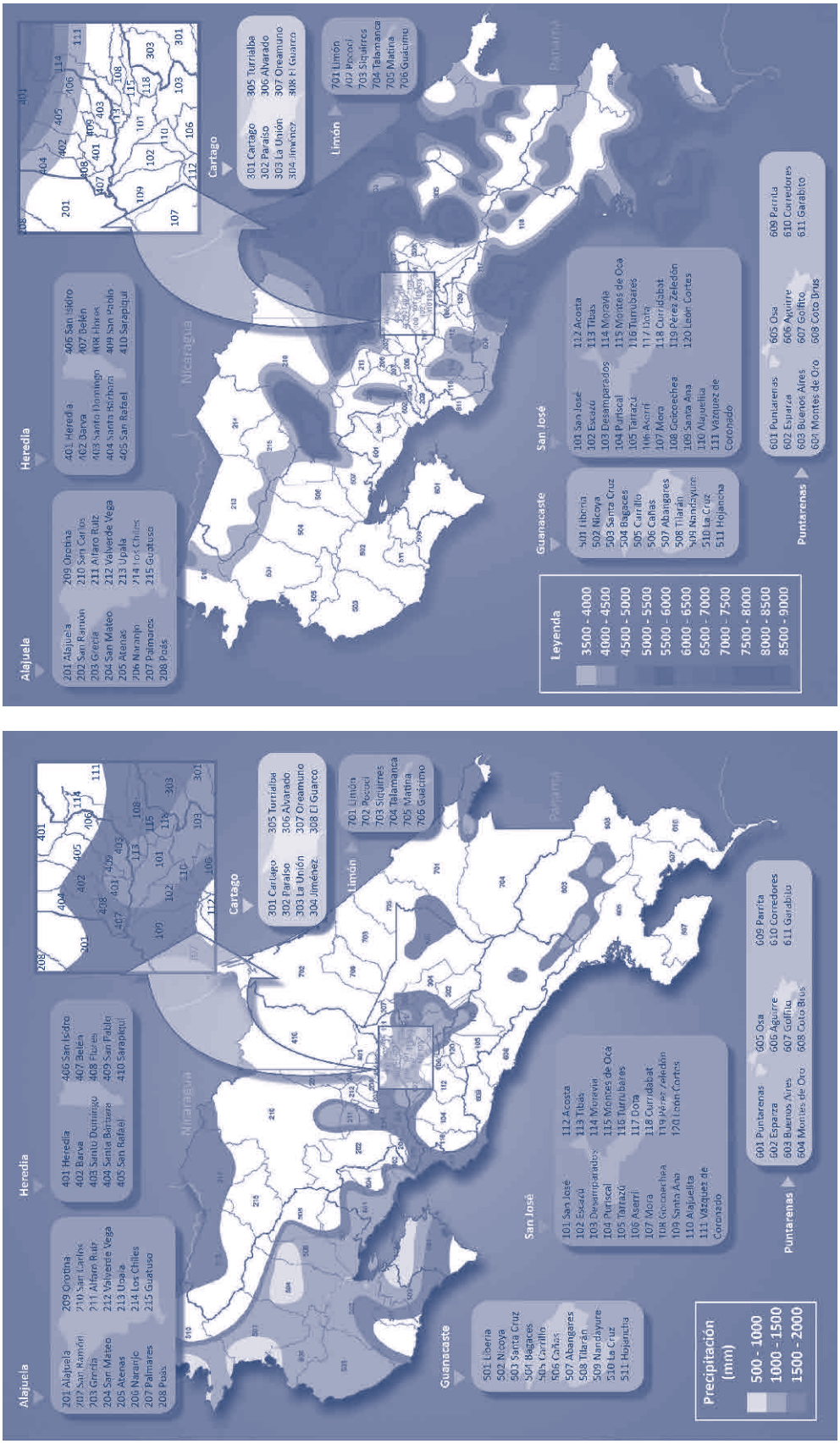


3.2. Vulnerability to climate change

Costa Rica is already one of the most exposed countries to natural hazards

Costa Rica is located in a multi-hazard zone, and the **intensity of natural hazards** has steadily increased in recent decades. Although subject to a range of extreme climatic events, floods and droughts are the most severe in terms of area coverage, frequency and intensity (MINAET, 2011). From 1988 to 2014, Costa Rica experienced 42 extreme climatic events (MAG-MIDEPLAN, 2016). While the frequency has remained relatively stable, the severity of these shocks has increased in recent years (Figure 3.3). According to the World Risk Index

Figure 3.3. **Drought-prone and flood-prone areas in Costa Rica**



Source: MINAET (2011).

(ADI, 2014), Costa Rica has the seventh highest risk of disasters worldwide. Moreover, it is the second most exposed country in the world to multiple natural hazards: 37% of the geographic area is exposed to at least three hazards (World Bank, 2005).

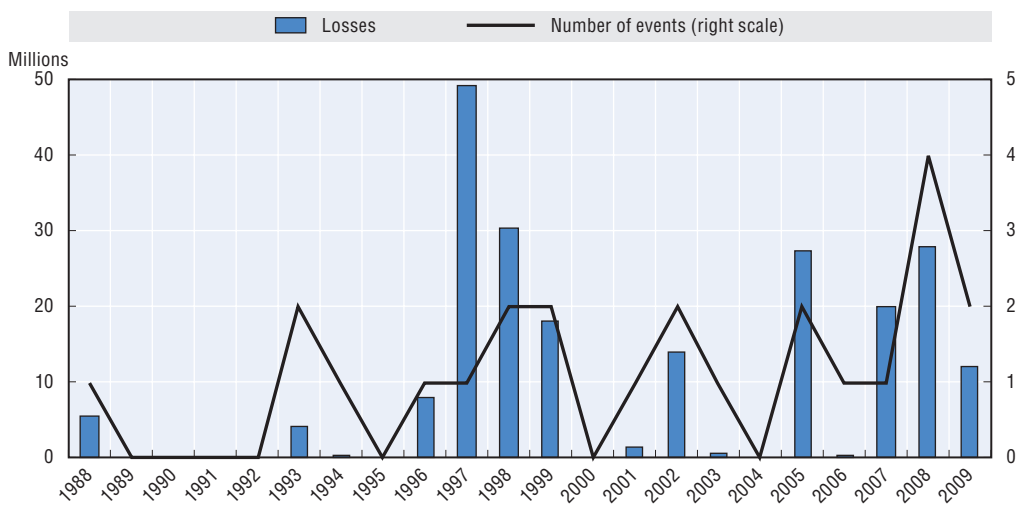
While Costa Rica is a water-abundant country, climatic trends have exacerbated **droughts** in several key agricultural regions. Agricultural production is threatened by water shortages across a dry corridor that runs from parts of the North to the Central Continental area to a dry nucleus in the South (MINAET, 2011) (Figure 3.3). The severity of droughts has increased in recent years in the Northern and Central Pacific during *El Niño* and in the Northern and Caribbean regions during La Niña. Guanacaste, a key region for livestock production in the North, is particularly prone to drought (MINAE, 2014). Most recently, agricultural losses from severe droughts were recorded in 1997, 2009 and 2014 (MAG-MIDEPLAN, 2016).

Increasingly severe **floods** are also a growing concern for Costa Rica. The Caribbean coast and Central and Southern Pacific regions are most affected, particularly due to heavy rainfall during *La Niña* years.[5] Heavy rainfall and flooding also occur in the Northern and Caribbean regions, and intensify in *El Niño* years (MINAET, 2011). Agricultural losses from floods were particularly severe in 1994, 2005, 2007, 2008 and 2010 (MAG-MIDEPLAN, 2016).

Natural hazards are negatively impacting agricultural productivity

Extreme events have in turn **reduced agricultural production**. From 1988 to 2014, Costa Rica's agricultural sector experienced an estimated USD 461 million (2015 constant) in losses due to extreme floods and droughts (Figure 3.4). This represents 21% of the total economic losses – USD 2.2 billion – across all sectors of the economy from climatic events during that time period (MAG-MIDEPLAN, 2016).

Figure 3.4. **Number of climatic events and losses in Costa Rica's agricultural sector, 1988-2009**



Source: MAG-MIDEPLAN (2016).

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A wide range of **agricultural products** has been adversely affected. Severe flooding curtailed pineapple exports in 2013 and 2014, and banana production in the Caribbean zone in 2005, 2009 and 2015. Meanwhile, droughts have curbed livestock production, most recently in 2014 (USDA, 2014). For instance, Guanacaste's beef production – historically favoured by Costa Rica's fertile pasture areas – has suffered due to weakened animal feed production resulting from droughts (CORFOGA, 2000). Changes in temperature and precipitation have

also affected coffee yields – optimal temperature and rainfall levels have already been surpassed, and production has declined in certain long-standing coffee-growing regions (Ordaz et al., 2010). Temperature changes have also impaired bean production; some studies suggest current varieties in Costa Rica are not resilient in temperatures above 19°C (e.g. CIAT, 2015). Bean production is also vulnerable to *El Niño* and *La Niña* in the North, the Pacific North, and the Pacific South (MINAE, 2014). Moreover, optimal temperature and rainfall conditions for maize production have been exceeded in certain areas (Ordaz et al., 2010). Lastly, rice yields have declined during *El Niño* events, particularly in the Northern Pacific and Southern Pacific (MINAE, 2014).[6]

Rising temperatures – coupled with shifting rainfall conditions – have also contributed to the growth of **pests and diseases**. Between 1957 and 1997, temperatures increased by 0.4°C every 10 years in central Costa Rica (IPCC, 2014). Although temperatures have stabilised in the last decade (Ordaz et al., 2010), the spread of pests and diseases has in fact multiplied.[7] In particular, the earlier increases in temperature and humidity enabled the roya fungus to flourish, stunting coffee production to such a degree that an "agricultural emergency" was declared between 2013 and 2015 (CGIAR, 2014). Warm and humid conditions and high precipitation have also encouraged the spread of the Stable Fly (Stomoxys calcitrans L) on pineapple plant residues and animal manure, triggering conflicts between livestock and pineapple producers.

Conditions are expected to worsen due to climate change

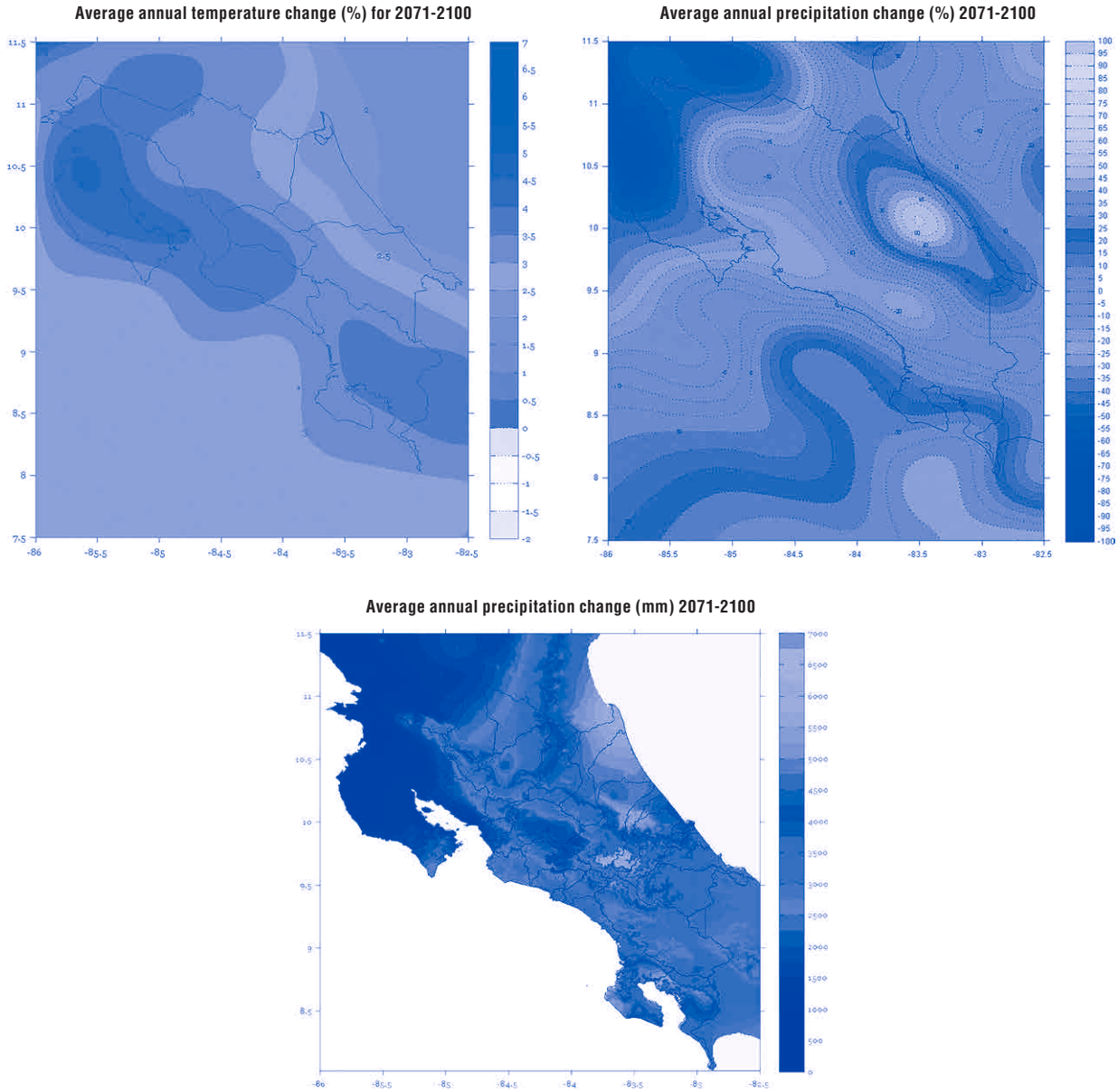
Existing projections, while relatively few, suggest that **rising temperatures and the severity of natural hazards will increase** in many regions of Costa Rica. Average annual temperatures are projected to rise by between 2.07°C and 5.15°C by 2100, with regional variations (IMN, 2012)[8] (Figure 3.5). Both floods and droughts are projected to concurrently increase in severity in certain areas – although average precipitation will decline. Regions will again be differentially affected: average annual precipitation is projected to increase by between 10% and 50% in the Caribbean region and by approximately 30% in the South Pacific by 2100; yet it is projected to *decrease* by up to 10% in the Central Region and by up to 65% in the North Pacific region (IMN, 2012; Figure 3.5).

Climate change will impair the productivity of most agricultural products and regions

Climate change-induced **losses in agricultural production** are projected to lower agriculture's contribution to GDP by between 8% and 12% by 2100 (Ordaz et al., 2010).[9] These effects are likely to be compounded by rising competition for resources, such as water, and the large-scale degradation of land and water resources (Smith and Oelbermann, 2010). However, certain regions and crops are projected to disproportionately bear the brunt of these losses. On the basis of the climate change projections[10] in Figure 3.5 above – and the limited literature on agricultural impacts of climate change in Costa Rica – the production of Costa Rica's main crops is likely to be negatively affected over the next century (Box 3.2).

Poorer regions will be particularly affected by climate change-induced losses in agricultural production. As highlighted in Chapter 1, Costa Rica's poor populations are currently concentrated in the North, Caribbean and South Pacific regions. With projections of rising temperatures and increased flooding and droughts in most of these areas, poor people in rural areas are particularly vulnerable. Eleven of the cantons that are most vulnerable to climate change also have the lowest Human Development Index (HDI) scores. This overlap is concentrated in parts of the North, South Pacific, North Pacific and Caribbean regions (MINAET, 2011).

Figure 3.5. **Changes in temperature and precipitation projections, 2071-2100**



Source: IMN (2012), PRECIS model (A2 scenario).

Box 3.2. **Possible effects of climate change on Costa Rica's main agricultural products**

Projections suggest that climate change will negatively affect agricultural productivity in most regions, albeit to varying degrees. Only a subset of the North region will be spared from climate change.[1] The implications of projections for Costa Rica's (i) main agricultural products[2] (pineapple, banana, livestock, coffee and sugar) and (ii) products with the highest proportion of farms (livestock, coffee, fruits [including pineapple][3], and basic grains [including rice, beans and maize]) are discussed below.

Due to the limited number of available projections and data on the vulnerability of key agricultural products, caution should be exercised when interpreting these findings: the trends identified are not comprehensive – rather, they provide rough approximations extrapolating from a single model (Precis[4]),

Box 3.2. **Possible effects of climate change on Costa Rica's main agricultural products** (cont.)

scenario (A2) and supporting literature in order to illustrate Costa Rica's potential vulnerability and the need for a more comprehensive risk assessment. A CGIAR (2015) model provides relatively similar projections for the six most important crops in each canton in 2030 under A1B climate projections.[5] However, an in-depth assessment based on other models, scenarios and local conditions is needed to identify relevant policy recommendations for the crops below:

Pineapples. Pineapple producers in the North region may well face stable conditions, but less concentrated production areas such as the North Caribbean may experience increased flooding, due to rising precipitation.

Bananas. The projected increase in precipitation in the Caribbean is likely to increase flooding and negatively affect production in key banana regions, particularly in the North Caribbean.

Livestock. The majority of key livestock-producing regions are projected to face adverse effects from climate change. Drought-prone areas in the North Pacific and parts of the North region are particularly vulnerable. Other parts of the North and Caribbean regions may be affected to a lesser extent.

Coffee. Most of the country's main[6] coffee-producing regions are likely to be negatively affected by climate change. The South Pacific may face the highest risk – rising temperatures and declining precipitation may limit the area suitable for coffee production and increase the spread of pests. Production may also be negatively affected in the Central Region (due to declining precipitation and rising temperatures) and the Central Pacific (due to rising temperatures). Further north, conditions are likely to be more stable.

Sugar. Although stable conditions are projected in key sugar-producing areas in the North region, other parts of the North Pacific may suffer from declining precipitation. At the same time, sugar may actually benefit from climate change as climatic conditions begin to favour production across a broader area (CGIAR, 2015).

Rice. Most regions with concentrated rice production are likely to face more extreme conditions in the coming decades, although *La Niña* may provide some relief. In the North Pacific and parts of the North region, rising temperatures and declining precipitation may negatively affect future production, while other parts of the North region may remain unscathed. In parts of the South and Central Pacific regions, meanwhile, rising temperatures may be the greatest source of concern. At the same time, an analysis of the *El Niño* Southern Oscillation (ENSO) also suggests that most rice-producing regions will experience a net benefit from ENSO by 2100, suffering from *El Niño*, but benefitting to a greater degree from *La Niña* (MINAE, 2014).

Beans. The majority of regions with concentrated bean production – namely the South Caribbean, South Pacific, North Pacific and parts of the North region – may be negatively affected by rising temperatures. Declining precipitation may compound temperature effects in dry areas. The effects of rising climate variability from the ENSO cycle will be limited and will vary by region (MINAE, 2014).

Maize. Declining precipitation in the North Pacific and North regions may increase vulnerability and curtail maize productivity. At the same time, production prospects in the South Caribbean appear more optimistic. However, MINAE (2014) suggests that increased variability in the ENSO cycle by 2100 may negatively affect production in most regions (excluding the Caribbean): while most regions will benefit from *La Niña*, losses in *El Niño* will offset this gain.

1. Adaptation of key crops in this area – such as sugar, livestock, pineapple, beans and rice – is thus less critical.
2. Main crops are measured in terms of percentage value added for the agricultural sector in 2014 (pineapple (34%), banana (15%), livestock (14%), coffee (4%) and sugar (4%).
3. Agricultural products with the highest proportion of farms include: livestock (29%), coffee (25%), fruits [including pineapple] (10%), and basic grains [including rice, beans and maize] (9%).
4. PRECIS is a regional climate modelling system developed by the Hadley Centre.
5. Two exceptions to this are the North Caribbean and the Pacific North regions, which may benefit in the short term.
6. Main is defined in this context as regions with more than 4 000 hectares per canton.

Source: IMN (2012), PRECIS model (A2 scenario).

3.3. Key areas of focus going forward

Building on a strong historical record of tackling environmental and climate change issues, the Costa Rican government is already making noteworthy progress across the four dimensions of adaptation policy. Yet, opportunity remains to maximise the impact of these policies. Adaptation is already prioritised in several strategies, and is also indirectly supported by synergies with other objectives – in particular, Costa Rica's integrated approach to addressing climate change means that mitigation measures also encourage adaptation in some instances. Sustainable development objectives are also aligned with the country's landscape-based approach to adaptation. At the same time, however, progress has been slowed by misalignment with other agricultural priorities and incomplete funding (Section 3.3.1). Costa Rica has also made noteworthy steps in both information generation and dissemination about vulnerability to climate change and adaptive solutions, although an adaptation research agenda has not yet been developed, and information dissemination to farmers remains uneven (Section 3.3.2). In terms of rule-based regulations, many rules could potentially affect adaptive practices, but their impact is likely to be limited because they do not explicitly consider adaptation and because of weaknesses in enforcement (Section 3.3.3). Lastly, although most financial incentives are aligned with adaptation, their impacts are limited due to a focus on current vulnerabilities (Section 3.3.4).

3.3.1. Making adaptation a strategic priority

Effective implementation of adaptation policies starts with the inclusion of adaptation in strategic documents. Clear objectives should be set for adaptation in national and sectoral strategies – this signals political commitment and is a prerequisite for policy effectiveness (OECD, 2012b; Chun and Rainey, 2005). Adaptation objectives must also be aligned with other objectives within and beyond the agricultural sector – alignment minimises trade-offs and reduces inconsistent signals (Ignaciuk, 2015a; Ignaciuk, 2015b; OECD, 2012c). Lastly, clear budget classifications are needed to track adaptation spending in pursuit of these objectives, and to support monitoring and evaluation (OECD, 2012c; OECD, 2006a).

Given the vulnerability of Costa Rica's agricultural sector to climate change and its potential impact on productivity growth, adaptation should be a **strategic priority** within the country's agricultural policy framework. Cognisant of the threat posed by climate change, the national government has taken the critical first step of identifying adaptation in several of its strategies as a tool for achieving the broader agricultural policy objectives of productivity growth and poverty reduction. These explicit objectives on adaptation are also aligned with strategic objectives such as climate change mitigation and sustainable development. However, other objectives – such as food sovereignty[11] in rice, beans and maize – are misaligned with adaptation, promoting the production of crops that are not adapted to future conditions in many parts of the country. Moreover, budget allocations do not match the sector's adaptation objectives – this is due in part to the fact that, as in most countries, adaptation expenditures are not systematically labelled in the budget. Against this backdrop, the gap between strategic adaptation objectives and adaptation practices highlighted in subsequent sections may not be surprising.

Adaptation features to some extent in Costa Rica's national strategies and, more prominently, in its agricultural and climate strategies

The Costa Rican government's interest in adaptation builds on a long-standing strategic prioritisation of **environmental protection and sustainable development**. The national Constitution, adopted in 1949, states that "everyone is entitled to enjoy a healthy and

ecologically sustainable environment for development, and has the duty to preserve it" (Article 50). Since the 1970s, tax incentives and subsidies have actively promoted these ideals through a stronger emphasis on forestation and conservation. Since the 1980s, a range of government initiatives has also promoted sustainable development, including land and water conservation, biodiversity and agroforestry (Extension Services, 2015).

Building on this history, Costa Rica's **integrated approach** to agri-environmental issues can be seen today in its approach to tackling climate change. Costa Rica's focus on climate change mitigation in agriculture, for instance, illustrates the country's recognition of interlinkages between agriculture and the environment. Synergies across adaptation and mitigation are also promoted across a range of strategic documents, including in the agriculture sector. Moreover, as illustrated in several of the strategies outlined below, Costa Rica is moving towards a landscape and ecosystem-based approach to adaptation (DCC, 2016).

This environmental history and integrated approach has favoured the prioritisation of climate change adaptation in a multitude of strategy documents (Annex 3.A1). These include national, sectoral, rural development, climate change and risk management strategies. **National and sectoral strategies**, for instance, highlight a clear vision for adaptation policy in the agriculture sector, notwithstanding certain caveats:

- The Ministry of Agriculture and Livestock (MAG) (Annex 3.A2) first identified adaptation as an important priority in its **long-term strategy for the agricultural sector**, the "State Policy for the Costa Rican Agri-food Sector and Rural Development 2010-2021" (*Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010-2021*) (SEPSA/MAG, 2011). Mirroring shifts in environmental policy elsewhere in Latin America (PIADAL, 2013), this long-term policy has identified climate change and agro-environmental management as one of four strategic areas for the development of the agricultural sector.
- Adaptation and mitigation have since appeared as a key pillar in the **short-term strategy for the agricultural sector**, the "Policies for the Agricultural Sector and Rural Territorial Development" (*Políticas para el Sector Agropecuario y el Desarrollo de los Territorios Rurales)* for 2011-14 (SEPSA/MAG, 2010) and 2015-18 (SEPSA/MAG, 2014) (henceforth referred to as the "Agricultural Policies" document. While not comprehensive, the 2015-18 "Agricultural Policies" document outlines a broad range of adaptation challenges and objectives. It highlights the importance of adaptation for maintaining production capacity, and identifies a number of useful adaptation policies and programmes, including on: (i) land use, agricultural zoning and digital soil maps; (ii) research on the responses of crop varieties to extreme weather events; (iii) the development and promotion of resilient seed varieties; (iv) water efficiency and the development of water-related storage systems, technologies and infrastructure investments; (v) the strengthening of irrigation and drainage to reduce excess water and expand areas for production; and (vi) the promotion of appropriate technology use in line with crop, region and economic conditions, as well as with climate variability and change. While covering a broad territory, it is unclear whether this list is comprehensive without undertaking a systematic needs assessment based on climate projections.
- Building on the agricultural sector's long-term strategy, the **National Development Plan** 2015-2018 (NDP) (*Plan nacional de desarrollo)* (MIDEPLAN, 2014) refers to adaptation; however, linkages between adaptation and the principal objectives set for the agricultural sector – increasing productivity growth and reducing poverty – are limited. This is an important

omission as, in the long term, adapting the sector to a changing climate is central to achieving these objectives. The NDP does emphasise the importance of adaptation in broad terms throughout the plan. Nevertheless, specific targets for adaptation in the agricultural sector for 2015-18 are limited: there is only one sub-target for the agricultural sector and two objectives for environment (to increase the number of institutions, including MAG, which incorporate climate change into their plans, and to increase adaptation practices through the Adaptation Fund).

The following governmental **climate change strategies** have also promoted adaptation in the agricultural sector:

- In 2009, the Ministry of Environment and Energy[12] (MINAE)'s Directorate of Climate Change (DCC) published the **National Climate Change Strategy** (ENCC) (*Estrategia Nacional de Cambio Climático*) in an effort to reduce the negative impacts and make the most of new opportunities generated by climate change, through mitigation and adaptation (MINAE, 2009). The ENCC lays out Costa Rica's vision for preparing for adverse situations related to climate variations, and reducing the economic costs of climate change.
- The development of the **National Climate Change Action Plan** (*Plan de acción Estrategia Nacional Cambio Climático*) in 2012 was an important step forward for the strategic prioritisation of adaptation. The Action Plan was developed to guide the allocation of public and private resources in a more strategic, co-ordinated manner for mitigation and adaptation objectives. It includes ecosystem-based adaptation as one of its priorities.
- Development and implementation of a **National Adaptation Plan** in the coming years is expected to accelerate and clarify the direction of Costa Rica's adaptation agenda. With support from the Spanish Agency for International Development Co-operation, the National Adaptation Plan will be finalised by the end of 2017 (DCC, 2016). The plan aims to (i) identify risks at sectoral and regional levels, (ii) propose specific actions, (iii) estimate short, medium and long-term costs, and (iv) develop performance indicators for each action, among other objectives (DCC, 2014). Sectors included in this plan are water, energy, agriculture, fisheries and coastal zones, health, infrastructure, biodiversity and tourism. Implementation of the plan would constitute an important step forward for adaptation policy. Several of the recommendations contained within this chapter – including the need for performance indicators and a comprehensive vulnerability assessment – are directly aligned with the objectives of the Adaptation Plan.
- The Costa Rican agricultural sector is also finalising a **sectoral strategy** for climate change (*Estrategia del Sector Agropuecario para el Cambio Climatico y Gestion de Riesgos a Disastres*). This strategy explores adaptation priorities in more depth than the National Adaptation Plan, with the aim of acting as a complementary document at sectoral level. In preparation for its finalisation, the Controller General has mandated the development of (i) a monitoring and evaluation scheme to assess climate change policies and programmes and (ii) an information system on agriculture-specific variability, climate change and risk management issues.

International and regional adaptation commitments complement national efforts

At the **international level**, Costa Rica's UN commitments on adaptation have increased, mirroring a parallel evolution in the country's domestic policies. In 2015, Costa Rica laid out a number of commitments for adoption by 2030 in its Intended Nationally Determined Contributions (INDC), including finalisation of the aforementioned National Adaptation Plan and efforts to integrate rural development, mitigation and adaptation actions.

At the **regional level**, Costa Rica's adaptation agenda has also benefited from several related initiatives. Within the Central American Integration System (SICA)[13], the government has subscribed to the Regional Climate Change Strategy (ERCC) and its Regional Adaptation Fund. Moreover, Costa Rica is a signatory to the Regional Environmental and Health Strategy (ERAS), a consensus-led initiative of SICA's councils of agriculture, environment and health ministers. ERAS' Central American Agricultural Policy also includes a pillar on climate change and variability. SICA further provides a platform for bringing together experts, sharing good practices and technical support, and facilitating political co-ordination (as it did prior to the latest COP meetings, for example) (SEPSA, 2016). Many adaptation initiatives have, nevertheless, not advanced far beyond declarations of intent. SICA's Regional Adaptation Fund, for instance, is yet to be implemented.

Several other government priorities implicitly support adaptive practices

Other strategic priorities for the agricultural sector indirectly promote several tenets of adaptation. In particular, Costa Rica's integrated approach to tackling climate change enables **mitigation** objectives to also support adaptation. Depending on the local context and projected climatic changes, a range of measures can reduce emissions and also be adaptive (resilient seeds, efficient resource use and tree planting, to name a few) (DCC, 2012; Section 3.3.4). Mitigation is emphasised as a key political priority in the 2015-2018 "Agricultural Policies" document as well as the Climate Change Strategy and Action Plan and National Strategy for Low-Carbon Livestock.

Objectives related to **sustainable development** and **resource efficiency** also offer synergies with the national ecosystem-based approach to adaptation. For instance, the promotion of green business (a secondary objective of Pillar 4 in the 2015-2018 "Agricultural Policies" document) highlights the importance of sustainable practices and payment for environmental services – both of which can be adaptive in certain contexts (Section 3.3.4). Efficient use of water resources – a critical issue in areas with projected increases of drought severity – is also promoted in the Water Agenda 2013-30, a roadmap for integrated and sustainable water management. Finally, the National Water Policy (NHP)[14] emphasises that water vulnerability should be reduced and that preparations should be made for the potential impacts of climate change.

Costa Rica's strategic priorities on **risk management** also support adaptation. The "National Risk Management Policy 2016-2030", developed by the National Commission of Risk Prevention and Emergency Response (CNE), highlights the importance of adaptation and recommends its integration within risk management.[15] "Integrated risk management" is also a strategic focus of the Policy for the Agro-food Sector and Rural Development 2010-21, including suggestions for the incorporation of climate change in local and regional risk management plans. The 2010-21 policy also suggests raising awareness about climate change in the agricultural sector via information and training programmes.

Certain agricultural priorities are not fully aligned and may encourage maladaptive practices

The focus on **food sovereignty** in the 2015-2018 "Agricultural Policies" document as a means to achieve food security with vulnerable crops (Pillar 1) is a prime example of a priority that effectively discourages adaptation. As highlighted in Section 3.1, the production of staple food items, such as beans and rice, is likely to decline in the medium to long-term, due to climate change in certain regions. A range of policy measures to encourage production of

these crops considerably distorts incentives to adapt in vulnerable areas, thereby limiting the resilience of the agricultural sector to a changing climate.

Furthermore, the objective of increasing **agricultural exports** (Pillar 5) could be further integrated with the adaptation objective for the agricultural sector. As mentioned in Section 3.1, the vulnerability of certain products is increasing. While productivity growth is an important objective for the country as a whole, it may not be sustainable for several crops in a subset of regions. To account for these vulnerabilities and take advantage of new opportunities in a changing climate, adaptation needs to be mainstreamed within the country's export strategy. Costa Rica can increase the long-run returns to its agricultural export policies by targeting regions and crops that are less vulnerable to climate change, and encouraging adaptive measures in others.

Lastly, the rural development objective (Pillar 3) of the 2015-2018 "Agricultural Policies" document omits reference to the importance of **product and income diversification**. In light of the growing vulnerability of a range of agricultural products to climate change, product and income diversification represents an important safeguard for farmers' incomes – and thus an important tool for achieving the government's objectives of tackling poverty. Crop and income diversification objectives should thus be highlighted and prioritised under the rural development pillar.

Although limited by resources, recent efforts to strengthen co-ordination will improve alignment

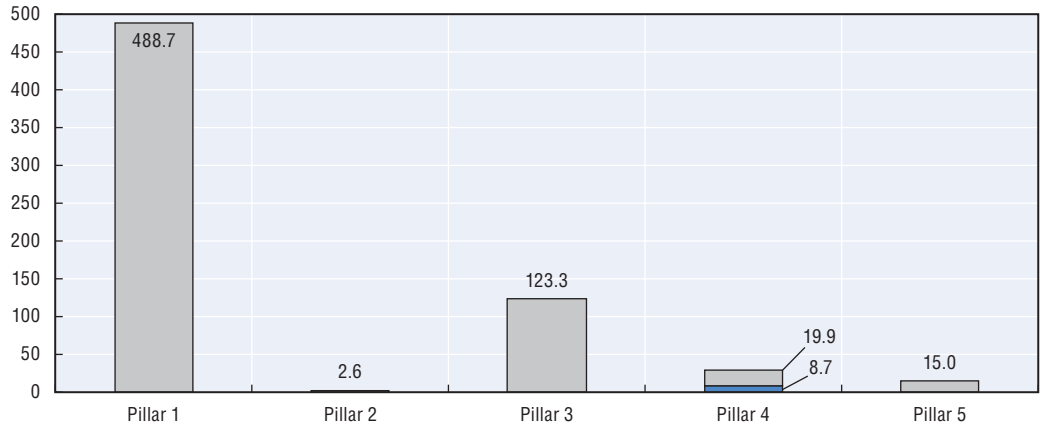
Efforts to co-ordinate the climate change agenda have increased with the establishment of several **inter-institutional bodies** in recent years. The Environmental Sectoral Council (*Consejo Sectorial Ambiental*)[16], for example, supports high-level political co-ordination on environmental issues (such as the preparation of INDCs). The Inter-Ministerial Technical Committee (*Comité Técnico Interministerial de Cambio Climático*), meanwhile, is convened monthly by DCC to monitor mitigation and adaptation activities and provide technical inputs for the implementation of proposed climate change policies.[17] In addition, following an order by the Controller General, the Sectoral Climate Change Commission (*Comision Sectorial de Cambio Climatico*) was established in 2016 to co-ordinate activities across the main agricultural institutions. Its role and interaction with MINAE is still under development. Finally, the Executive Secretariat for Agricultural Sector Planning (*Secretaria Ejecutiva de Planificacíon Sectorial Agropecuaria* [SEPSA]) is working with DCC to prepare a roadmap by October 2016 on how to mainstream the climate change agenda across the agricultural public sector, with clear objectives for each institution.

Noteworthy steps have been taken to co-ordinate efforts on the adaptation agenda, although these efforts are limited to some extent by **resource constraints**. For instance, DCC has a full-time staff of four people to implement its broad mandate of co-ordinating, managing, developing and implementing public policy on climate change across all sectors. As mitigation receives the most financing, staff time allotted for adaptation is particularly limited. In its 2015 INDC, Costa Rica indicated an intention to strengthen co-ordination across relevant stakeholders on adaptation and mitigation objectives; an executive decree later in 2016 will provide an important first step by expanding DCC into a cross-sectoral agency with wider co-ordination capacity and human resources. Finally, the role of MAG in co-ordinating the adaptation agenda is also limited by resource constraints. As only one person can be hired for every seven that retire, APS staff are responsible for more and more projects – in practice, this limits the capacity to push the adaptation agenda forward in the agricultural sector.

Budget allocations are not fully aligned with the government's adaptation objectives

MAG's budget allocations for adaptation target appropriate activities, but do not support all objectives identified for the sector. Pending a comprehensive assessment[18] of the impact of climate change on agriculture, it is difficult to assess the funding available for adaptation; however, in broad terms, adaptation funding should target legitimate government activities such as providing farmers with information about climate change, and addressing market failures where information is not enough. In Costa Rica's case, budget allocations appear to be in line with such broader priorities; however, not all of the specific priorities identified by the government have been allocated funding. According to the "Agriculture and Rural Development Sector Plan 2015-2018" (*Plan Sectorial de Desarrollo Agropecuario y Rural 2015-2018*), adaptation receives USD 8.7 million – or 1.3% of the total agriculture budget (USD 662 million) (Pillar 4 in Figure 3.6) for: (i) a project on water efficiency (USD 4.5 million); (ii) a project on soil mapping (USD 4.3 million); and (iii) a project on sustainable agriculture and good practices[19] (USD 0.1 million) (SEPSA, 2015). Yet the objectives identified for adaptation span well beyond these three projects to areas such as strengthening land management programmes and zoning, research on climate-resilient seed varieties, and irrigation and drainage improvements.

Figure 3.6. **Planned agricultural sector spending by strategic area, 2015-18**
(Millions USD)



Note: Pillar 1 is "Food and nutrition security and sovereignty"; Pillar 2 is "Opportunities for youth in agriculture and rural areas"; Pillar 3 is "Rural territorial development"; Pillar 4 is "Adaptation and mitigation of climate change in agriculture" (in which the blue bar denotes planned spending on adaptation); and Pillar 5 is "Strengthening the agro-export sector."
Source: SEPSA (2015).

StatLink http://dx.doi.org/10.1787/888933451933

It is noteworthy that MAG's adaptation budget for 2015-18 (USD 8.7 million) is 68% higher than the 2011-14 budget (USD 5.2 million); however, this increase may stem from inconsistencies in **budget classification** rather than increased financial commitments. In 2011-14, adaptation funds focused primarily on sustainable production issues such as greenhouses, tree-planting and cover crops; awareness-raising among 726 farmers; and research on new varieties for maize and beans. Water efficiency projects were covered under competitiveness issues. By contrast, under the current plan, water efficiency expenditures have been reclassified within climate change mitigation and adaptation (Pillar 4). Given such shifts across pillars, it is difficult to assess whether the government has made substantive increases in adaptation spending.

In addition to MAG's budget estimates, adaptation measures are also budgeted under the 2014-21 National Climate Change Action Plan (NCCAP). Approximately 13% of NCCAP's USD 25 million budget – USD 3.3 million – is explicitly allocated to adaptation in the agricultural sector. Other NCCAP components include information generation (USD 4 million), capacity building and technology development (USD 3.5 million), public awareness (USD 6.5 million) and financing (USD 2.3m).[20] As noted previously, without a comprehensive risk assessment, it is not possible to assess the extent to which these allocations target priority adaptation areas and whether they complement or duplicate MAG funding.

Next to these explicit budget allocations for adaptation, a number of line items in **national and sectoral budgets** may indirectly be targeted at promoting adaptation. Examples in the agriculture section of the 2015-18 NDP include: (i) extending the Arenal-Tempisque Irrigation District (DRAT) irrigation project to an additional 7 200 hectares (USD 14 million); (ii) installing irrigation technology on 1 131 hectares (USD 11.0 million); and (iii) extending drainage infrastructure to 11 912 hectares (USD 8.9 million).[21] Examples in the Agriculture and Rural Development Sector Plan 2015-2018 include USD 17.2 million in spending on climate risk management measures (SEPSA, 2015).

CNE – the main department responsible for risk management – also indirectly supports adaptation through risk reduction efforts such as climate-proofing infrastructure. CNE also helps farmers to access financing (or extends loan periods), provides inputs and machinery, and provides some emergency cash payments when a disaster occurs. The limited scope of this safety net arguably supports adaptive behaviour by sending a clear signal to farmers about the government's role in the event of a disaster: limiting the implicit contingent liability discourages farmers from taking on excessive risk with the expectation of ad hoc government support if a shock occurs.[22]

Lastly, **local government funds** for land use planning and water management could also indirectly promote adaptation. In particular, local governments can reduce the vulnerability of the agricultural sector by building climate-proof dikes, creating buffer zones and developing biological corridors. However, not all local governments are integrated into the adaptation agenda – some regions have developed regional adaptation plans and have climate change commissions, but others have more limited capacity (SEPSA, 2016; CNE, 2016; DCC, 2016).

Adaptation is largely funded by development partners, complicating longer-term budgetary planning

Development assistance provides a large source of funding for climate change-related activities in the agricultural sector. For instance, DCC – an important source of funding for adaptation – is largely funded by donor assistance (99.96% of DCC's total budget in 2015 (USD 6.1 million) was donor-funded) (Sancho, 2016). Approximately 9.5% of this budget – USD 0.6 million – targets adaptation explicitly, 99.6% of which was funded by donors.[23] The UN Adaptation Fund is also providing external support to Costa Rica – USD 10 million – in the coming years. This financing was first sought in 2012 to target adaptation projects in three sectors in 2015-20: (i) agriculture, (ii) water resources, coastal zones and fisheries, and (iii) capacity building (Annex 3.A3).

While financial support has indeed helped to jumpstart several adaptation programmes, Costa Rica's high **dependence on external assistance** for the promotion of adaptation complicates the country's longer-term strategic planning for adaptation. Donor funding cycles are often both brief and subject to changing priorities. Moreover, available funding does not necessarily match national priority areas for adaptation in the agricultural sector.

Inconsistent expenditure classification impedes identification, monitoring and prioritisation

As in most countries, **inconsistent budget classifications** complicate the assessment of adaptation-related expenditures and impede clear signals about the prioritisation of adaptation policies. As noted above, the classification of projects as "adaptation-related" shifted between the two most recent Agriculture and Rural Development Sector Plans. At the same time, measures which indirectly promote adaptation goals – for example, several interventions subsumed under Pillars 1 ("Food Security") and 3 ("Rural Territorial Development") of the 2015-18 Policies document – are not counted as adaptation. Moreover, adaptation spending is not tracked at institution level (INTA, SEPSA and the Office of Agricultural Extension). Such shortfalls in tracking adaptation spending are consistent with more general weaknesses in budgetary practices in other government entities that work on adaptation. In particular, MINAE and the National Meteorological Institute (IMN) scored 62.5/100 and 37.4/100 respectively in a national assessment of budgeting effectiveness in the Controller General's 2012 Institutional Management Index (CGR, 2013). The introduction of a consistent, cross-institutional budget classification scheme for adaptation measures – within the agricultural sector and beyond – would allow a comprehensive evaluation of adaptation efforts and enable the government to budget appropriate funding for its strategic adaptation objectives.

3.3.2. Enhancing information generation and dissemination

Information is a key tool to encourage adaptation to climate change. Information generation – through in-depth assessments of the agricultural sector's risk exposure and the identification of adaptive solutions – forms the foundation for an effective adaptation strategy (WRI, 2011). As asymmetric information can lead to maladaptive choices, building awareness among farmers is also key. Information dissemination about vulnerability to climate change and potential solutions is therefore necessary to enable farmers to make informed decisions (Ignaciuk and Mason-D'Croz, 2014; Stuart et al., 2014; Blennow and Persson, 2009).

Building on a longstanding interest in sustainable development and agri-environmental issues, Costa Rica has already made noteworthy advances in both **information generation and dissemination** efforts related to adaptation. Research into climate risks is institutionalised, with a range of public and private bodies researching some adaptive solutions. Similarly, government agencies, donors and agricultural supply chain organisations[24] provide technical assistance on a wide range of measures that can potentially promote synergies with adaptation.

Nonetheless, farmer awareness of long-run climate changes and adaptive solutions is uneven due to both information generation and dissemination constraints. In terms of information generation, vulnerability assessments for Costa Rica's main crops have yet to be completed. An overall research programme on adaptive solutions is also needed, as research activities remain fragmented. Co-ordination weaknesses and capacity shortfalls across institutions, as well as public resource misallocations, also limit awareness-building among farmers – a critical challenge, given the relatively low level of education in rural areas (Chapter 1). Lastly, the dissemination of adaptive practices is inhibited by budget and staff constraints, ad hoc inter-institutional co-ordination and inefficient resource decisions, such as high fees among government agencies for climate datasets.

Some climate change projections are available, but research on vulnerability is limited

While Costa Rica has conducted **climate change projections**, the number of models used is limited. At present, IMN assesses the country's exposure to climatic risks, including forecasting and monitoring medium-term, climate change-related weather phenomena such as ENSO, cyclones and cold fronts. In collaboration with IMN, CNE also monitors weather phenomena in high-risk areas – for landslides and floods, for instance – and has published a preliminary inventory of current threats for different territories that could be expanded to incorporate climate projections.[25] Given the uncertain impact of climate change, however, a wider set of models should be considered.

While there are some studies on the implications of climate change for agricultural production, **vulnerability assessment coverage** remains limited to certain crops. With support from UNDP, IMN has assessed the vulnerability of rice, maize and beans. A couple of agricultural supply chain organisations[26] – the pineapple association (CANAPEP), for instance – are also conducting assessments.[27] However, as detailed in Section 3.1, vulnerability assessments and projections have not been completed for all of Costa Rica's main crops and regions. MAG-MIDEPLAN's Database on the Impact of Natural Phenomena is a first step in this direction – this free online database provides data on historical losses by region and crop, and could offer a supporting reference for future vulnerability assessments. Costa Rica's recent subscription to WAVES, a natural asset accounting system developed by the World Bank, will also provide an important source of information on the country's water resources and ecosystems for these assessments.

A range of institutions are researching adaptive solutions, but an overall strategy is yet to be developed

Public institutions have advanced several adaptive solutions, principally through research by MAG's research institute, the National Institute for Innovation and Transfer of Agricultural Technology (INTA). In recent years, INTA's priorities have included a number of adaptation-related themes, both independently and in co-operation with public universities (MAG, 2014). For instance, INTA has four experimental stations that focus on water efficiency in order to combat land degradation, desertification and drought. INTA also conducts research on climate-resilient crop varieties. Most recently, the institute has explored solutions to specific challenges for – among others – rice (drought resistance), maize (drought resistance) and beans (high temperature) (INTA, 2015a). Studies have also been conducted on adaptation in grass, fodder and herd management. Moreover, INTA is developing land use maps with information on soil use, soil quality and water resources to help the government, private sector and farmers understand the optimal locations for certain crops.[28] These maps will be developed over the next five years.

At the same time, **INTA's limited resources** and **focus on food sovereignty** – rather than adaptation – preclude more far-reaching research on adaptive solutions. Currently, INTA has a staff of only four working on adaptation and has difficulty planning long-term projects as funding is only secured on an annual basis and only received on a monthly basis. The institute's capacity to advance a comprehensive research agenda on this topic is thus limited.[29] A number of INTA projects also promote resilience in the context of current climate variability, but the emphasis on adaptation is lacking. INTA's research on climate-resilient seed varieties, for instance, focuses on crops linked to the food sovereignty goal (rice, maize, beans). An adaptive – and, arguably, more effective – R&D focus would re-orient research towards a broader range of crops which are projected to be more

productive and resilient in Costa Rica's changing climate. Similarly, INTA's current land use maps inform geographic crop choices, but as of yet, they have not incorporated data on climate change projections.

Beyond INTA, a number of **universities** and **non-governmental organisations** pursue climate change and adaptation research. For instance, the *Universidad Estatal a Distancia* (UNED) conducts adaptation-related projects, frequently in co-ordination with MAG, on: (i) efficient fertiliser application, (ii) bean varieties, (iii) the use of greenhouses and micro-tunnels, (iv) alternative crops to cope with changing weather and soil conditions, and (v) mapping risks. The *Universidad Nacional de Costa Rica* (UNA)[30] operates a programme aimed at developing indicators to measure adaptation progress – an important input if Costa Rica establishes an adaptation monitoring and evaluation scheme. The *Centro Agronómico Tropical de Investigación y Enseñanza*'s (CATIE) is currently exploring agricultural practices that curb the effects of weather shocks and excess rainfall on grains and coffee. Lastly, the *Instituto Interamericano de Cooperación para la Agricultura* (IICA) researches agricultural resilience in the context of climate change, focusing on soil and water in collaboration with, among others, INTA.

Finally, several **agricultural supply chain organisations** are developing more climate-resilient agricultural practices, albeit without a systematic focus on climate change. For instance, the livestock organisation (CORFOGA) conducts research on practices to strengthen the drought resilience of livestock. The banana producers' organisation (CORBANA) is also developing new technologies to support the resilience of bananas – with a particular focus on wind and disease resistance.[31] The sugar cane producers' organisation (LAICA), and rice organisation (CONARROZ) are also studying variety resilience to changes in temperature and rainfall. It should be noted, however, that these organisations do not systematically take climate change projections into account in their research agendas.

While many of these research programmes are indeed co-ordinated across institutions, a **comprehensive research strategy on adaptation** is lacking. The current patchwork of research projects covers a wide range of topics, but certain areas – the vulnerability of export crops, and adaptive solutions, for instance – are less well developed. Limited INTA resources and prioritisation of adaptation are partly the cause. However, research fragmentation also stems from co-ordination failures. The National System of Agricultural Research and Technology Transfer (SNITTA) is responsible for co-ordinating research across public, private and academic sectors, including on adaptation. Yet in practice, SNITTA is largely not operational (Chaves, 2011). Given the large number of public and private institutions that would need to co-ordinate on an adaptation research agenda, high-level political commitment is likely to be a prerequisite to remedy the existing research fragmentation around adaptation.

Some information on climate change is disseminated, but most initiatives focus on current vulnerabilities

MAG disseminates some information related to climate change, although projections are not incorporated into technical assistance programmes on farming practices. MAG has launched a number of initiatives to raise awareness about climate change in recent years. These include an annual calendar with climate change facts (MAG, 2010c); references to climate change and mitigation – albeit not adaptation – in a technical guide for sustainable agriculture (MAG, 2010a); and a series of bulletins to inform 10 000 farms (11% of all farms) about climatic conditions (focusing on ENSO in 2014).[32] MAG also disseminates information on practices that can indirectly support adaptation, including field trips for farmers to learn about innovative bean and rice techniques, and 133 integrated pedagogic farms to promote

crop diversification (Extension Services, 2016). Moreover, several of MAG's economic incentive programmes (Section 3.5)[33] are accompanied by technical assistance for practices that can be adaptive, for instance: cover crops, precision planting, planting trees and bushes to reduce water loss, and more productive feed options for cattle.[34] However, these programmes do not include information on climate change projections, or on which sustainable practices would be most relevant given these projections.

Some information about climate change risks and responses is also provided by **other government institutions,** albeit with a focus on current vulnerability as opposed to projected changes. For example, IMN publishes daily and weekly weather information via its website and mobile applications, and provides assistance, co-operation and extension to different institutions through lectures, training and agro-meteorological studies. CNE has developed a public online portal to bring together data and information generated by universities and research centres on threats – including landslides and floods – in different territories. CNE also operates an early warning system, supported by active community participation (Sancho, 2016). Moreover, the National Service of Underground Water, Irrigation, and Drainage (SENARA) has conducted a number of information campaigns on the importance of reducing water overuse. Lastly, INTA has successfully disseminated a new disease-resistant rice variety to nearly 90% of rice farmers (INTA, 2016). Moreover, INTA's soil maps are sometimes considered when determining farmer eligibility for certain bank loans (Section 3.3.4) (INTA, 2015b).

Several **agricultural supply chain organisations and donors** complement information dissemination by government agencies, although information on future vulnerability is also lacking. For instance, the coffee-growers', millers', roasters' and exporters' organisation, Instituto del Café de Costa Rica (ICAFE), sends weather projections to coffee farmers by mobile. Dos Pinos – the milk producers' co-operative – and CORBANA advise farmers on adapting products to different soil and climate conditions – with a particular focus on how to manage current droughts and floods rather than extreme events in a changing climate. CORFOGA has developed a workbook in collaboration with MAG and the United Nations Development Programme (UNDP) that provides its livestock members with information about adaptive practices such as pasture rotation, efficient water use, bush plantations for fodder, and more effective fodder storages (MAG et al., 2015). Donors also support a number of projects that indirectly promote principles of adaptation. The United Nations Food and Agriculture Organization (FAO), for instance, has encouraged crop diversification – a relatively neglected tenet of adaptation in other technical assistance programmes – amongst 1 000 poor farmers in Southern Costa Rica.

Farmer awareness is impeded by resource shortfalls, barriers to information sharing, and co-ordination failures

Notwithstanding these efforts, farmer awareness about climate change and adaptation remains low for several reasons. First, **resource shortfalls** in many agencies curtail information dissemination. Budgetary limitations, for instance, have precluded Extension Services from disseminating climate risk information to more than 11% of farms (Extension Services, 2015). Regional extension offices also lack – with the exception of certain regions – the requisite expertise to analyse climate data and, therefore, to identify and disseminate regional solutions. Moreover, extension staff are often taxed by heavy administrative responsibilities[35] and have limited funds for field visits (Extension Services, 2015). Agricultural supply chain organisations are an inadequate remedy for limited public capacity, as 70% of producers are

not members of any organisation (INEC, 2014). In practice, farmers therefore rely primarily on advice from input sellers, exacerbating vulnerability through input overuse (Extension Services, 2015).[36]

Barriers to information sharing also exacerbate the effect of budget constraints on information generation and dissemination. In particular, restricted access to IMN's retrospective climate and weather-related data hampers the development of vulnerability assessments for key crops. IMN's aggregate projections are freely available online, but disaggregated retrospective data is typically only available for purchase. Moreover, data is normally only provided for limited time periods, and data updates are difficult to obtain.[37] At the extreme, these barriers encourage duplication of information collection and dissemination efforts. CORBANA and ICAFE, for instance, deemed it more cost effective to build their own weather stations to gather meteorological data. Although IMN may not have all of the crop-specific data needed, this decentralised approach to data collection is a less efficient use of existing resources and impedes farmer awareness and the identification of adaptive solutions.

Lastly, **co-ordination weaknesses** constrain the dissemination of climate information and adaptive solutions. For instance, mechanisms for IMN to disseminate information about climate change to other relevant government stakeholders (e.g. SENARA, and Extension) are ad hoc rather than institutionalised. Extension's efforts to disseminate information to farmers – a handful of one-off initiatives rather than an institutionalised and cohesive adaptation education programme – are also impeded by limited co-ordination mechanisms with local offices and INTA. Lastly, as mentioned previously, DCC is making impressive efforts to co-ordinate across institutions – however, understaffing has slowed progress in its monitoring role. In line with the UNFCCC Paris Agreement, DCC aims to start fulfilling this mandate in the coming years with strengthened reporting and the development of baseline data on climate actions. To this end, DCC will develop indicators to measure adaptation for SINAMEC, a planned Integrated National Metrics System on Climate Change.

3.3.3. Ensuring effective rule-based regulation

Information is not always sufficient to incentivise farmers to adapt to climate change. Barriers to adoption such as market failures may impede adaptation. High set-up costs, for instance, constrain investments in climate-smart technologies (Stuart et al., 2014). Uncertainty about climate change – and thus about the benefits of adaptation – is another barrier (Eakin et al., 2015): farmers are less willing to invest in adaptive measures when the payoffs are unclear. Behavioural biases and the long-term nature of the payoff to adaptation can further limit incentives (Gruère and Ignaciuk, 2016). Moreover, regulations in support of other policy objectives may distort incentives to adopt adaptive practices. Lastly, regulations may also lack the requisite flexibility to adjust in a changing climate. Governments can overcome such barriers by aligning rule-based regulation and economic instruments (Section 3.3.4) with adaptation goals (Ignaciuk, 2015a).

Rule-based regulation is often referred to as a "command-and-control" approach – it entails setting a mandatory level of performance or prohibiting a specific behaviour. Individuals or firms that break the rule are penalised. A common approach in environmental regulation since the 1970s, rule-based regulation sends clear signals about expected behaviour (UNIDO, n.d.), although reforms can be slow to push through and enforcement can be resource-intensive.

Due to Costa Rica's historical emphasis on environmental issues, many **rule-based regulations** could potentially encourage adaptation to some degree; yet their impact is limited, both due to the lack of integration of clear adaptation objectives and to difficulties in monitoring and enforcement. For instance, while a number of environmental regulations to ensure land and soil quality have helped to improve resilience, they focus on current vulnerabilities, and their impact has been hindered by implementation difficulties. Recent regulatory reforms have strengthened water resource management, although weak co-ordination and monitoring and enforcement also curb the impact of these improvements. Climate-proofing infrastructure is also encouraged, but is not mandated – a common oversight that leaves the sector exposed to significant long-term losses if future extreme events affect agriculture-related infrastructure. Lastly, farmer decisions to adapt through crop diversification are effectively discouraged by a number of permit and licence requirements and weak zoning regulation.

Land-related regulation supports adaptation indirectly, but requires effective implementation

Soil conditions are a key determinant of vulnerability to climate change. As a large part of Costa Rica's crop cultivation and livestock production is carried out on sloping land, soil degradation due to water erosion is a growing challenge. Intensive farming techniques (in the case of agriculture) and overgrazing (in the case of livestock) are also contributing to degradation (SEPSA, 2016).

As discussed in Section 3.1, Costa Rica has attempted in recent decades to address soil degradation and thus to reduce farmers' vulnerability to natural disasters. The Organic Environmental Law 7554 (1995), for example, promotes economic and environmentally sustainable development. The "Conservation Management and Use of Soils Law 7779" (1998) (hereafter, the Soil Law) also supports adaptive behaviour by promoting the **protection, conservation and improvement of soils**. In particular, this law ordered the creation of soil maps (Section 3.3.2), and obliges land owners and tenants to prevent soil degradation. In an effort to achieve convergence between the objectives of agricultural production and soil and water conservation, the law also states that MAG and MINAE should regulate the use of products, machineries and tools that degrade soil, and control fertiliser and pesticide waste. However, this is not enforced in practice, and improvements in soil conservation and the recovery of fertile soil have reportedly been limited (Pomareda, 2015; INTA, 2016).

Tree-planting – which brings important benefits in terms of the reduction of soil erosion, provision of shade and protection of hydrological resources (GWP, n.d.) – has been promoted by the Forest Law 7575 (1996). This law forbids land cover changes (Nachmany et al., 2015); in particular, trees cannot be cut down in areas prone to soil erosion. Moreover, households must maintain a forest plan and monitor the different soil conditions of their properties. While reducing erosion, the current law may be overly stringent and limit adaptive opportunities to Costa Rica's changing climate. In particular, farmers are not allowed to use conservation land for wood production. Allowing sustainable wood production in certain protected areas could strengthen resilience through income diversification as climate change weakens the resilience of key products such as livestock.

Water resource management has been strengthened, but weak co-ordination and enforcement limit benefits for adaptation

Projections suggest that Costa Rica's water resources will decline and become more erratic in a changing climate. While supplies are dwindling in several key agricultural regions, a number of studies suggest that water inefficiency on farms, and the transportation of water

to farms is a key concern (e.g. Sancho, 2016).[38] Coupled with quality issues due to rising water pollution[39] – from municipal and domestic sources as well as agrochemical runoff from the pineapple industry (SENARA, n.d.) – future water shortages are likely to increase and negative public health consequences may occur. Rising demand for water, both due to the country's dependence on hydropower[40] and to increasing demand from other industries (ICE, 2012),[41] will further exacerbate competition for water resources. A range of national water regulations aims to address these challenges, and positive steps can be seen in recent years, but a number of barriers impede progress.

Costa Rica's **water legislation**, which was drafted in 1942, was not designed to cope with today's challenges of climate change and rising resource competition. The law's levy system (Box 3.3), for instance, caps water usage, but with such a high ceiling that it does not significantly curb water usage in the agricultural sector. The current law also decentralises water resources management across a number of institutions – MINAE, SENARA in MAG, and the Costa Rican Institute of Aqueducts and Sewers (AyA) – resulting in fragmented planning and overlapping functions that impede efficient management (Guzman-Arias and Calvo-Alvarado, 2013). Comprehensive revisions of the law were developed in 2014 and 2016 that could help to rectify current challenges, but these revisions have been held back by disagreements among stakeholders thus far.

Box 3.3. **Water pricing**

Improvements in water pricing have been made in the last decade. Public water users[1] have paid for water access since the introduction of the 1942 Water Law's levy system, but the rates were initially extremely low and heavily subsidised (Table 3.1). In 2006, MINAE reformed and dramatically increased water levies across all sectors,[2] leading many in the agricultural sector to reduce their concessions (GWP, n.d.). The rate increase in 2006 has enabled noteworthy improvements in water efficiency – and thus adaptation – but overuse remains a concern (SENARA, 2016). Water pricing schemes are most effective in the context of carefully designed water allocation rights and proper measurement, complemented by other tools such as information campaigns. While it is possible that water is still under-priced – as the agricultural sector is entitled to one of the lowest rates relative to most other economic activities – other factors may be driving inefficient water use. For instance, an information failure may contribute: farmers may simply not be aware of projections that Costa Rica's water resources are becoming scarce.

Table 3.1. **Levy for water use by activity**

Rate (USD/m³) until 2006			Rate (USD/m³) since 2006		
Use	Surface water	Groundwater	Use	Surface water	Groundwater
Domestic	0.00093	0.00129	Domestic	0.00263	0.00293
Industrial	0.00005	0.00035	Industrial	0.00475	0.00585
Population	0.00002	0.00002	Commercial	0.00475	0.00585
Irrigation	0.00003	0.00023	Agribusiness	0.00342	0.00445
Hydropower	0.00000		Tourism	0.00475	0.00585
Other	0.00001	0.00058	Agriculture	0.00232	0.00252
			Aquaculture	0.00022	0.00029
			Hydropower	0.00022	

Source: GWP (n.d.); Decree N° 32868 Canon for Water Use (2005).

StatLink http://dx.doi.org/10.1787/888933451940

A second water pricing scheme for DRAT users – the large-scale irrigation project in Guanacaste, a drought prone-region – has also recently been reformed to improve water efficiency. Until 2016, SENARA provided unlimited water access to qualifying farmers[3] for USD 113/ha/year. Taking climate change projections into

Box 3.3. **Water pricing** *(cont.)*

account, SENARA revised the pricing scheme and now charges a variable rate (0.0045 USD/m^3 on average) to all farmers according to availability and the costs of maintaining the irrigation system (Sancho, 2016). Crop-specific rates currently vary and provide a cross-subsidy to specific crops (such as rice, a crop that commonly overuses water in Costa Rica) (Table 3.2). Crop-specific rates will be adjusted in 2019 to reduce this preferential treatment. Although the cross-subsidy will not be completely eliminated in the short term, this new pricing scheme is expected to improve water efficiency and adjust production away from water-intensive crops in drought-prone areas.

Table 3.2. **Water pricing for agricultural production in drought-prone areas**

Crop	Rate (USD/m³)	
	2016-19	2019 onwards
Rice	0.00340	0.00414
Sugar cane	0.00562	0.00470
Pastures	0.00704	0.00506
Papaya	0.00612	0.00482
Watermelon	0.01107	0.00607
Onion	0.00878	0.00549
Citrus	0.008082	0.00531
Cotton	0.00630	0.00488
Corn	0.00747	0.00517
Pineapple	0.00835	0.00538
Pisciculture	0.00356	0.00419

Source: SENARA (2016).

StatLink http://dx.doi.org/10.1787/888933451957

1. Farmers rely on the following water sources: 37% on public-provided water; 55% on water directly from rivers, springs or wells; 1% on SENARA; 2% on water harvesting; 2% on other sources and 4% with no water use defined (INEC, 2014).
2. 25% of the levies is used to support the conservation of water resources in protected areas administered by the National System of Conservation Areas (SINAC), 25% is transferred to the National Forestry Financing Fund (FONAFIFO) for payment for environmental services on private land, and the remaining 50% is provided to MINAE's Directorate of Water for resource management.
3. Qualifying farmers included gravity irrigation users (approximately 95% of SENARA's users). For farmers that required pumping irrigation (approximately 5%), SENARA charged a variable rate based on volume (SENARA, 2016).

Notable efforts to improve **information-sharing and co-ordination** within the current system have been initiated in recent years. In particular, the Strategy for Integrated Water Resource Management took steps in 2014 to strengthen information management and sharing across MINAE and SENARA. For instance, an inventory of the country's water resources and development of a water accounting system, as well as a programme on water quality issues were recently initiated. A water resource information platform was also launched in August 2016. Moreover, the National Hydrological and Meteorological Committee (CNHyM) was created in 2015 to strengthen inter-institutional co-ordination and information sharing on water hydrology, climate variability and climate change (UNECLAC, 2016).

A number of **recent regulatory advancements** have also tried to ease water stress within the current system by promoting water conservation. The Organic Environmental Law (1995), for instance, was the first to state that aquatic ecosystems and water resources should be protected, preserved and restored. The Law for Integrated Water Resources Management (2014) also defines a protection radius for springs, rivers and streams.[42]

Although the necessary regulations for the strengthened resilience of Costa Rica's water resources are in place, **monitoring and enforcement** of these rules is uneven. As 50% of total water use is illegal (MINAE, 2013), and high pollution levels persist (SENARA, 2015; CGR, 2014), efforts have been made to strengthen monitoring and enforcement in recent years. Water meters have been installed on many wells in Guanacaste, a water-scarce region; however, other regions have been slow to follow. MINAE also conducts random checks at some farms to confirm appropriate drainage systems and ensure that production does not extend into vulnerable zones such as riverbanks. Moreover, MINAE has started to monitor groundwater: 40 measuring stations are already established in the North and Central regions, and 30% of Costa Rica will have stations by 2018. An online system called SIPECO is also being launched in the coming months to issue permits and levies. Many farmers operate without appropriate permits: 25% of wells are not authorised because of the long waiting periods and travel costs required to apply for a permit in San Jose (SENARA, 2016). Lastly, the recently-launched initiative, "Water for Guanacaste" (*Agua para Guanacaste*), aims to strengthen a number of dimensions of water resource management, including monitoring and efficient use to address long-term needs.

The lack of regulation for climate-proofing infrastructure puts agricultural productivity at risk

In addition to the direct effects of climate change on the agricultural sector, **damaged infrastructure** – such as roads, bridges, ports, electricity and irrigation – may indirectly inhibit production, processing and market access. From 2005 to 2011, the largest percentage of all economic losses due to natural phenomena was borne by road damage, with damage of USD 384 million (2011 constant). The electricity system was also negatively impacted, with losses of USD 309 million (CNE, 2015).[43] Looking forward, the vulnerability of Costa Rica's roads is likely to rise, with increasingly severe natural hazards. Rural roads, bridges and drainage systems are in particularly poor condition, and will likely suffer in areas with projected precipitation increases. Key ports – such as Limón, Puntarenas and Caldera – may also be vulnerable to floods (ProDUS, 2014). In addition, while most hydropower plants are located in water-rich areas of the country, several are in areas where droughts are projected to increase – such as the Northern Pacific and Central regions (Hidro Sur, n.d.).

Currently, Costa Rican **construction law** does not enforce minimum standards for climate-proof infrastructure. Climate-proofing is widely regarded as a critical tool for strengthening the resilience of infrastructure (Ignaciuk, 2015a; Siegel, 2015; Kay, 2015), as it ensures the risks and opportunities posed by alternative climate change scenarios have been taken into account in the project's design and maintenance (UNDP, 2011). The lack of regulation on climate-proofing increases the vulnerability of infrastructure to the increasingly severe hazards that have been projected.

Although no law exists on climate-proofing, MIDEPLAN does require[44] new public infrastructure projects to undertake a **natural hazard self-assessment** (as of 2009).[45] Climate change is specifically listed in MIDEPLAN's self-assessment as the most extreme example of socio-natural hazards. However, climate change projections are not included within the assessment framework (MIDEPLAN, 2010), and are not necessarily accessible for all users. Moreover, the assessment process is not monitored to ensure that users take climate change into account. An additional limitation is that this assessment is only required for public projects. The exclusion of the private sector may lead to underestimates of risk exposure and infrastructure vulnerability, as, for instance, only 30% of Costa Rica's irrigation systems are public (Astorga, 2013).

Notwithstanding these limitations, some public **efforts to adapt agriculture-related infrastructure** can be seen since the introduction of MIDEPLAN's risk assessment process in 2009. Costa Rica has, for instance, started mapping climatic risks to the infrastructure sector at the national level, focusing primarily on transport and water systems. One example is the programme of Investigation of Sustainable Urban Development (ProDUS, 2014), which assesses risks to transportation infrastructure – such as roads and bridges – due to bad drainage, as well as landslides, floods, rising sea levels and droughts (ProDUS, 2014). Costa Rica[46] has also mapped risks in the water sector, estimating that an investment of USD 2.05 billion (2005 constant) is needed for the 2010-30 period (UNDP, 2010). Moreover, CNE has started working with local governments to raise awareness about the importance of infrastructure standards and risk assessments to prepare for increasingly-severe natural disasters (CNE, 2016).

The risk assessment mandate has also coincided with a number of **climate-proof public projects** that will help the agricultural sector to prepare for a changing climate. For instance, climate change projections were taken into account in the current expansion of the Terminal de Contenedores de Moín (TCM) port – a USD 196 million investment (IDB, 2013; Baird and CH2M Hill, 2013). ProGIRH – an important water infrastructure project – has also considered climate change projections in the expansion of the DRAT, expansion of the Irrigation Area of the Small Area Irrigation and Drainage projects (PARD), and improvement of farmland drainage (SENARA, 2016). These initiatives target areas where water scarcity is already a concern and is projected to worsen. At the same time, many private sector initiatives and smaller projects do not make use of climate change projections, underscoring the need for further strengthening of climate-proofing regulations.

Some permit requirements impede diversification, but zoning plans indicate a possible way forward

Costa Rica's **permit and licence requirements** for changing crops are designed to protect the environment, but diversification – a useful strategy for reducing vulnerability to climate change – is impeded by their rigidity and slow procedures. For instance, the required permits to shift away from rice production or grassland to pineapple production aim to reduce agrochemical runoff into water, but also obstruct the flexibility of farmers to respond to changing climate conditions. Licences are also required to legally change business category, for instance from agriculture to livestock or to another economic activity. Moreover, the long-time horizons required for procuring such licences – 2-3 months in the best of cases, 6-12 when several ministries are involved (Sancho, 2016) – discourages diversification and thus constrains adaptation.

Costa Rica's emphasis on land-use **zoning** could encourage adaptive crop choices, but – as in many other countries – implementation has been limited. As early as 1983, the Organic Law No. 7064 indicated that MAG should support the agricultural and livestock sectors through – among other approaches – zoning programmes. The Environmental Planning Executive Decree 29393-MINAE (2001) elaborated on this law, mandating that agricultural activities should be limited to areas with appropriate soil conditions, as improper land use acts as a catalyst and magnifies hazards into disasters. Proper soil use depends on soil classification and whether the farmer is growing permanent or annual crops.[47] However, enforcement of this decree has been limited. Zoning was also identified as a priority for adaptation in the 2015-18 "Agricultural Policies" document and in the Second National Communication (MINAET, 2009). INTA's land use mapping exercise in the coming years will provide an important foundation for implementation in the coming years.

3.3.4. Aligning financial incentives

When information is not enough to encourage adaptation – for instance, due to market failures – a second tool that governments can turn to is financial incentives, or economic-based regulation. For instance, direct payments can provide short-term incentives to encourage behavioural changes in a subset of the population (though they are challenging to monitor, and often fall prey to a focus on practices instead of outcomes). Taxes can be effective measures to target the entire population, such as the reduction of environmentally harmful behaviours (OECD, 2006b). Risk-sharing measures – insurance, for example – help manage the catastrophic risks that climate change will increase, although they require specific terms and conditions to limit adaptation disincentives. Other types of economic instruments, such as market price support and input subsidies, are more difficult to align, as they can distort market – and thus, often adaptation – incentives (Ignaciuk, 2015a).

Adaptation is indirectly encouraged by many of Costa Rica's **financial incentives** for environmental protection and sustainable development, although the benefits for adaptation are constrained by the lack of systematic integration of adaptation objectives and a few distortive measures. For example, environmental benefits programmes encourage practices that are often adaptive, but adaptation is not explicitly referenced. Mitigation efforts (such as the NAMAs) and certain credit programmes may also indirectly incentivise a wide range of adaptive measures. In addition, the national insurance programme increasingly favours adaptation, although certain policy attributes counteract these benefits. Costa Rica also avoids using most types of input subsidies (Chapter 2); given the potential distortive effect that such subsidies can have for adaptation, Costa Rica is a model of good practice in this regard. On the other hand, other incentive-based regulations – namely, reference prices and trade restrictions – continue to encourage farmers to produce products that are not adapted to climate change in certain parts of Costa Rica.

Sustainable development and mitigation incentives can encourage adaptation

MAG may indirectly support adaptation through **financial incentives for sustainable practices** in a programme called "Recognition of Environmental Benefits of Sustainable Production" ('*Programa de Reconocimiento de Beneficios Ambientales*').[48] This programme provides technical assistance and 20-30% of the investment cost for 93 eligible sustainable practices in an effort to incentivise environmental management among small and medium-scale agricultural producers. Many of the eligible practices can also be adaptive.[49] However, climate change projections are not incorporated into the programme, a missed opportunity to tackle sustainable development and adaptation simultaneously.

The Soil Law (Section 3.5) set the **legal precedent for other financial incentives** that indirectly promote adaptation. For instance, land owners that comply with soil management, conservation and recuperation practices are eligible for property tax relief of 40% (Art. 49). Moreover, farmers that actively prevent soil degradation – through efforts to counter erosion, slump or salination, for instance – qualify for water use concessions (Art. 22). However, neither of these incentives are actually implemented in practice.

The **Environmental Services Programme**'s payments for planting trees and protecting water resources may also support adaptation by tempering climate variations. Established by the Forest Law **(1996)** through the Forest Fund and the National Forest Financing Fund (FONAFIFO), this compensation scheme provides USD 84 per year per hectare of land earmarked for conservation or agroforestry. The planting of an individual tree also qualifies

for a payment of USD 1.30 per tree, although this small sum is unlikely to be sufficient to incentivise farmers, given the bureaucratic obstacles involved.

While not a direct financial incentive and still small in scale, Costa Rica's **Ecological Blue Flag** *(Bandera Azul)* also deserves mention. This programme awards a blue flag to farmers in recognition of exemplary sustainable practices. While the farmer does not receive a financial payment from the government, a financial incentive is nevertheless implicit in the resulting publicity for the farmer's products. Importantly, one of the eligibility criteria for the flag is adaptation to climate change. However, the impact of the programme is limited by the fact that only 100 farms have been awarded the flag thus far (Azofeifa, 2013).

Nationally Appropriate Mitigation Actions (NAMAs) for several agricultural products (Box 3.1) also promote synergetic practices that can concurrently reduce emissions and promotion adaptation). For example, the coffee NAMA which is jointly implemented by the Costa Rican government and the coffee sector, encourages a range of practices with potential adaptive benefits, including: (i) improvements in water efficiency;[50] (ii) reductions in fertiliser use; (iii) the adoption of pest and disease-resistant seed varieties; and (iv) income diversification into agroforestry[51] (Fundecooperacion and ICAFE, 2015). Equally, the livestock NAMA provides financial incentives for several practices that could also be adaptive, including: (i) pasture resilience through livestock rotation, and (ii) fodder banks (MAG, 2015).[52] However, the strong potential of the NAMAs to promote adaptation is currently hampered by a lack of information-sharing; without information campaigns on regional climate change projections and relevant adaptive solutions for each local context, farmers cannot identify which practices maximise both mitigation and adaptation opportunities.

Financial incentives in several agricultural credit programmes have potential to promote adaptation

Although not actively involved in the adaptation agenda, and focused on current vulnerabilities, a number of **agricultural credit** programmes may also have the potential to indirectly encourage adaptation. Banks such as Nacional de Costa Rica, Banco de Costa Rica, Banco Popular and Bancredito allocate credit and determine loan availability partly based on current climate conditions. This incentivises producers to incorporate practices such as zoning according to land use potential and vulnerability. Banco Nacional also partners with ICAFE to offer preferential interest rates for farmers that buy specific seed varieties based on the farm location (highland or lowland). The Soil Law also provides the legal foundation for banks to withhold credit access in "critical areas" without a study about the ecological impact and land capacity – however, it is unclear whether any banks currently apply this.

The potential for Costa Rica's credit programmes to foster adaptation continues to be constrained by two key factors. First, bank conditions depend on current risk, and do not necessarily take future exposure into account (Sancho, 2016). This means that loans may be issued based on conditions that are not sustainable and thus actually increase farmers' vulnerability to climate change. Second, approximately 86% of farmers do not use credit to finance their activities (INEC, 2014). This is primarily due to cumbersome requirements for credit access. Thus, the benefit of these incentives for adaptation are currently limited.

Recent improvements in agricultural insurance encourage adaptation, but barriers remain

In 2015, Costa Rica's National Insurance Institute (INS) launched a **new insurance scheme** with a number of adaptation-enhancing dimensions. In contrast to the previous scheme's[53] focus on rice producers – which implicitly subsidised rice production in spite of

rising vulnerability in certain areas – the new scheme covers several of Costa Rica's main crops (rice, coffee, sugar cane and pineapples for export) and plans to expand to others this year (palm, banana, beans and maize).[54, 55] INS also aims to reduce vulnerability by limiting insurance access to farmers that subscribe to planting dates identified for each region, crop type and variety – these criteria are adjusted depending on weather conditions and IMN forecasts. The new insurance products also improve farmer awareness about risk exposure, by pricing the products according to three levels of geographic risk (low, medium, high). Moreover, discounts are provided to farmers that invest in risk-reducing activities such as soil conservation, the monitoring of pests and disease, soil analysis, and organic fertilisers (INS, 2016). While climate change projections are currently not considered, INS is planning to launch a pilot in co-operation with Fundecooperacion and CATIE that reduces premiums for coffee, sugar, potatoes, palm, pineapple, rice, beans, vegetables (onion, tomato, broccoli, carrot), poultry, pigs and livestock if farmers implement specific mitigation or adaptation measures (INS, 2016).

In spite of recent improvements, the potential for Costa Rica's insurance programme to facilitate adaptation continues to be constrained for several reasons. One concern is that **take-up levels are extremely low** (only 1.25% of all hectares were insured in 2015). Insurance is an important tool not only for enabling productive investments (Dercon and Christiaensen, 2011), but also for raising awareness about vulnerability to climate change and thus the importance of reducing risk exposure. Depending on the design, improving insurance coverage could thus simultaneously strengthen both productivity and adaptation. One barrier to take-up is the limited insurance culture among Costa Rican farmers (INS, 2015), suggesting the need for information campaigns or targeted insurance subsidies to overcome societal expectations that the government will step in when a disaster occurs and to encourage prudent management of lower levels of risk. As many of its products are still being fine-tuned, INS is taking a targeted approach to increasing coverage by collaborating with banks and co-operatives in the short-term.

Another key concern is that the **structure of crop insurance** may encourage maladaptive behaviour. In particular, crop insurance payouts are typically subject to lengthy waiting periods that disrupt efficient – and thus often adaptive – spending on farm expenditures. As claims are settled within 30 days, many farmers lack the liquidity needed to keep farms in operation, let alone to reduce vulnerability to future risks. Traditional forms of crop insurance can also incentivise moral hazard: as payouts are determined by losses at plot level, farmers may make less effort or engage in maladaptive practices in order to disrupt yields and benefit from the insurance coverage. Alternative insurance schemes, such as hybrid products with index components,[56] can address these challenges to some extent by providing more timely pay-outs and reducing moral hazard. Costa Rica is starting to explore such products, with an index pilot programme for coffee insurance and a feasibility study on drones to measure losses.

Price support mechanisms often encourage maladaptive product choices

Costa Rica's **reference price system** discourages shifts to crops that are more adapted to a changing climate. Of biggest concern is the reference price for rice, which encourages farmers to grow rice by offering stable prices that are often above the international price. As discussed in Chapter 2, the reference price is an improvement over the fixed price that benefited rice producers until 2015. However, the reference price is largely followed, and thus still distorts incentives to grow rice in regions with rising vulnerability. Price support

can have negative environmental consequences and is moreover not an effective tool to sustain food security in a changing climate (OECD, 2005).

Tariffs may also encourage farmers to produce products that are not adapted to climate projections for certain regions. For instance, farmers benefit from tariffs on beef, dairy, onions, rice, beans and sugar, in spite of climate projections that the vulnerability of these products will increase in certain areas. These products are also excluded from many Free Trade Agreements (or are subject to extended phase-out periods). Trade is an important mechanism for countries to adapt to changing climate conditions and to develop sustainable comparative advantages (Nelson et al., 2009). Costa Rica's tariffs and other trade barriers impede this adjustment, a further reason that they should be addressed as a priority.

3.4. Summary

- Costa Rica's **vulnerability to extreme events** is negatively impacting its agricultural productivity. Conditions are expected to worsen in many regions due to climate change, further harming the sector.
- **Adaptation** can help Costa Rican farmers to minimise the negative effects of climate change and take advantage of the new opportunities that these changes will bring. While some adaptive practices are already widespread among farmers, others are underused.
- Cognisant of the threats posed by climate change to the sector's broader objectives of increasing productivity growth and reducing poverty, the government has **prioritised adaptation** in several strategies. Adaptation measures also benefit indirectly from the government's integrated approach with other priorities such as sustainable development and climate change mitigation. Nevertheless, several strategic objectives – such as food sovereignty – are misaligned with adaptation, promoting the production of crops that are not adapted to all regions of the country.
- Costa Rica's budget allocations appear in line with the good practice of providing farmers with information about climate change, and addressing market failures where information is not enough; however, not all of the specific priorities identified by the government have been **allocated funding**.
- Costa Rica has made noteworthy progress in both **information generation and dissemination** about the agricultural sector's vulnerability to climate change and adaptive solutions. Research into climate risks is institutionalised, and a range of public and private bodies are researching some adaptive solutions. Similarly, government agencies, donors and agricultural organisations provide technical assistance on a wide range of measures that can potentially promote synergies with adaptation, although most focus on current vulnerability concerns.
- Notwithstanding these efforts, **farmer awareness** of climate change projections and adaptive solutions is uneven, due to both information generation and dissemination constraints. In terms of information generation, vulnerability assessments for Costa Rica's main crops remain incomplete, and institutions pursue a fragmented set of research activities. Moreover, resource shortfalls, barriers to information sharing, and co-ordination weaknesses also limit information dissemination.
- Many **rule-based regulations** already encourage adaptation to some degree, yet their impact is limited by the lack of integration of clear adaptation objectives, and limited monitoring and enforcement. For instance, a number of environmental regulations to ensure land and

soil quality have helped to improve resilience against disasters – however, their impact has been hindered by implementation challenges. Recent regulatory reforms have also strengthened water resource management, although co-ordination and enforcement challenges limit the impact of these improvements. Climate-proofing infrastructure is also encouraged, but not mandated – an important oversight that leaves the agricultural sector exposed to significant losses. Lastly, farmer decisions to adapt through crop diversification are largely discouraged by permit and licence requirements – however, the strengthened implementation of zoning plans in the coming years may help address these distortions.

- Costa Rica has a number of **financial incentives** in place that encourage adaptive practices to a certain extent, although again, the benefits for adaptation are constrained in the absence of the systematic integration of adaptation objectives and climate change projections. Environmental benefits programmes, for instance, have the potential to encourage sustainable development practices that are often adaptive – however, adaptation is not explicitly referenced. Mitigation efforts (such as the NAMAs) and certain credit programmes may provide a similar incentive for a wide range of adaptive measures, although the impact is constrained without information about climate change projections and adaptive solutions for the local context. Recent improvements in the insurance programme have the potential to enable greater adaptation, although certain policy terms risk counteracting these benefits.
- Lastly, Costa Rica's limited reliance on **input subsidies** – a common distortion towards maladaptive practices – is laudable. At the same time, other incentive-based regulations – namely, **reference prices and trade restrictions** – encourage farmers to produce products that are not adapted to climate change in certain parts of Costa Rica.

Notes

1. Under the Intergovernmental Panel on Climate Change (IPCC) A2 and B2 scenarios and with a discount rate of 2-4%.
2. 10% of coffee farmers use tolerant varieties to combat the recent spread of rust (SEPSA, 2016).
3. This is the case, for instance, for rice and bean farmers in the North region (Extension Services, 2015).
4. Maladaptive choices are more harmful than helpful and in fact increase vulnerability to climate change.
5. The *El Niño* Southern Oscillation (ENSO) consists of three phases: *El Niño* (warm phase), *La Niña* (cold phase) and the neutral phase. See Chapter 1 for further details.
6. On an upside, productivity has increased in some cantons during *La Niña* (MINAE, 2014).
7. Pests and disease have proliferated in crops such as rice (bacterial blight); coffee (rust); sugar (orange rust); and cattle (ticks) (MAG, 2014). The rat population in Guanacaste has also increased due to higher rainfall from La Niña, raising concern about the spread of disease and the destruction of crops. Moreover, rising humidity has encouraged the proliferation of molluscs such as snails and slugs, threatening crops east of Cartago and in the Caribbean (MAG, 2010c). The spread of pests and disease may also have been exacerbated by the overuse of agrochemicals (Section 3.5).
8. Projection is based on the PRECIS model (A2 scenario). Other models provide similar projections (IMN, 2012).
9. With discount rates of 4% and 2% respectively.
10. This extrapolation acknowledges that the projections are limited by the consideration of only one model and scenario.
11. Costa Rica has its own definition for food sovereignty (Chapter 2).

12. As subsequent sections will discuss in more detail, MINAE is responsible for the design, development, evaluation and control of sector policies relating to climate change, including adaptation. Within MINAE, the Directorate of Climate Change is the multi-sector co-ordinator in the formulation of policies, plans, programmes and projects focused on compliance with the National Strategy on Climate Change.
13. SICA's members include Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. The Dominican Republic is an associate member.
14. Established in 2009, this framework aims to address long-term problems in water management. The National Plan of Integrated Management of Water Resources is a technical instrument to support this process.
15. Although not included in the specific objective, the policy notes that climate change is a key risk and that risk management should be more flexible in order to adjust to this changing context.
16. The Environmental Sectoral Council recently replaced the Inter-Ministerial Council for Climate Change.
17. Technical advisory committees by CNE are also co-ordinated on threats and risks.
18. The National Adaptation Plan for 2017 should help to strengthen the matching of adaptation needs and financing in a more systematic way.
19. Not all components of this project are related to adaptation.
20. The extent to which this funding targets adaptation rather than mitigation could not be determined.
21. The projects to install irrigation technology and extend drainage infrastructure are funded by the BCIE Progirh project.
22. A careful balance is required. Productivity can suffer if farmers are stuck in a risk-induced poverty trap (Dercon and Christiaensen, 2011).
23. As outlined above for other climate change and agricultural budgets, adaptation practices may also be affected by other expenditure items which do not directly target adaptation.
24. MAG extension services focus primarily on basic grains, cattle, dairy and vegetable farmers, while agricultural supply chain organisations provide extension support Costa Rica's other main crops (Chapter 2).
25. *www.cne.go.cr/index.php/prevencie-desastres-menuprincipal-93/mapas-de-amenazas*.
26. Agricultural supply chain organisations complement government services such as research and development and technical assistance for specific agricultural products. All of these organisations have private sector participation; in many cases, the public sector is also involved (Chapter 2).
27. These assessments are being conducted under the Action Plan for Strengthening Responsible Production and Trade of Pineapple in Costa Rica 2013-2017.
28. Maps for certain regions, such as the Central Occidental and the Jesus Maria basin/valley, have already been completed (MAG, 2011; MAG, 2014). The maps will be developed at a scale of 1:50 000. A previous version was developed in 1989 at a scale of 1:200 000.
29. As INTA's budget does not earmark R&D expenditures for adaptation, a similar inference based on budget expenditure is precluded.
30. UNA also manages a USD 200 million World Bank loan to enable four state universities to conduct research and provide scholarships on climate change, risk management, and food security.
31. CORBANA funds this research by drawing on part of a USD 0.05 surcharge on each box of bananas sold.
32. Only one bulletin highlighted that climate change increases uncertainty and shifts the timing of seasons in temperate regions forward, due to rising temperatures.
33. These include the Recognition of Environmental Benefits of Sustainable Production Program, and the Organic Agriculture National Program (MAG, 2015).
34. In total, extension supported 32 902 producers in 2014. Data on how many of these producers benefited from adaptation-related extension is not available.
35. These responsibilities include issuing vehicle and fire permits, conducting surveys on rural income levels, and distributing emergency supplies.

36. A UNDP study found that only 3.1% of respondents viewed agrochemicals as a problem for the environment, and only 0.6% considered the use of agrochemicals in monocultures, such as pineapple and bananas, as serious (UNDP, 2014).
37. There are some exceptions: INTA, CNE and CONARROZ, for instance, reportedly have access to some of the data that they require (INTA, 2015b).
38. SENARA receives 1 300 million cubic metres of water per year, but only 600 million cubic metres of this are used; the remaining 700 million cubic metres flows into the sea. Under the "Agua para Guanecaste" Project, Costa Rica plans to build a new reservoir to capture the remaining water (SENARA, 2015).
39. 57% of Costa Rica's rivers and estuaries have high levels of pollution (WB, 2016).
40. Nearly 64% of Costa Rica's electricity capacity is derived from hydropower (ICE, 2012).
41. 55% of total water used is for the agricultural sector. Urban and industrial growth and the intensification of agriculture, livestock and tourism are increasing demand for water resources. As discussed later in this section, infrastructure for the storage, handling and distribution of water is also lacking (ICE, 2012).
42. In practice, this has meant that some farmers – small and medium-scale farmers in particular – have lost their farms (MAG, 2014b). While impacts such as these are severe in the short-term, this measure helps to ensure the long-term sustainability of water resources for future farmers in a changing climate.
43. This does not include losses to the agricultural sector as a result of breakdowns.
44. Mandatory according to the Executive Decree No. 35374-PLAN Standards Guidelines and Procedures for Public Investment, published in 2009.
45. The Natural Hazard Self-Assessment is also called the "Risk Analysis Matrix for Construction Sites to Natural and Socio-Natural Hazards for Investment Projects in Costa Rica".
46. With support from the Investment and Financial Flows Assessment by the UNDP.
47. MAG defines the classification of types of usability as follows: Class I lands have little or no constraint on agricultural and forestry activities, including livestock ecologically adapted to the area; Class II lands have slight limitations that alone, or in combination, reduce the choice of activities or increase production costs, due to the need for management practices and soil conservation; Class III lands have moderate limitations that restrict the choice of crops. The use for annual crops requires intensive management practices, soil conservation and water; Class IV lands have severe limitations, alone or in combination, to restrict their use to semi-permanent and permanent vegetation; Class V lands have severe limitations to the development of annual, semi-permanent or permanent crops or forest, therefore its use is restricted to grazing or natural forest management; Class VI lands are used for forest production and permanent crops such as fruit and coffee, although the latter require intensive management practices and soil and water conservation; Class VII lands have severe limitations, therefore only management of forest cover is allowed. Class VIII lands do not meet the minimum conditions for agricultural production or forestry activities (Sancho, 2016).
48. This programme originated as the Program Promoting Sustainable Agricultural Production (PFPAS), following a loan agreement with the Inter-American Development Bank (IDB). The programme received USD 14.5 million in funding. The PFPAS supported 105 projects in 2010-11, benefiting 20 000 families and 64 000 hectares (MAG, 2010b). Since 2011, MAG has allocated funds from its regular budget to continue funding environmental projects. While the scale of the programme has been reduced (approximately 2 500 farmers benefited in 2015, for instance), its structure is relatively similar to before.
49. For instance, fodder banks for sustainable livestock systems; improved sustainable livestock grazing systems; irrigation systems that optimise water use; cover crops; terracing; trees for reforestation purposes for protective use, windbreaks, shade coffee and apparatus in pastures; landslide control measures; flood control; conservation equipment; and infrastructure to reduce water pollution.
50. This includes, for instance, reducing water use in coffee processing, and using wastewater to irrigate pastures.
51. New trees also help to prepare for rising temperatures by creating shade for crops below and combatting soil erosion.
52. 134 farms have already been enrolled, with plans for expansion (Box 3.1).
53. The previous scheme operated from 1969 to 2015.
54. Insurance payouts cover the cost of production, as opposed to estimated income losses.

55. Group policies are available to financial entities, co-operatives and farmer associations, with discounts depending on the number of hectares secured together and types of crop. Discounts up to 35% are available for group policies (an effective mechanism for increasing take-up).

56. Index insurance issues payouts according to a pre-determined index, such as rainfall levels at the local weather station or average crop yields in the region.

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ANNEX 3.A1

Key strategy documents related to adaptation

National Adaptation Plan	2017
National Risk Management Policy	2016-2030
Intended Nationally Determined Contributions (INDC) to the UNFCCC	2015-2050
National Development Plan	2015-2018
Sector Plan for Agricultural and Rural Development	2015-2018
Low Carbon Livestock Strategy	2015
Third National Communication to the UNFCCC	2014
National Climate Change Action Plan	2012
State Policy for the Agro-food Sector and Rural Development	2010-2021
National Risk Management Strategy	2010-2015
National Climate Change Strategy	2009
Second National Communication to the UNFCCC	2009
C-neutral strategy	2007
First National Communication to the UNFCCC	2000

ANNEX 3.A2

Selected governmental departments involved in adaptation

The Ministry of Agriculture and Livestock (MAG) sets the strategic direction for the agricultural sector's priorities – including adaptation – and supports implementation in certain areas through extension services (Office of Agricultural Extension).

The National Institute for Innovation and Transfer of Agricultural Technology (INTA) conducts research and development for the agricultural sector, including a number of adaptation-related projects.

The National Service of Underground Water, Irrigation, and Drainage (SENARA) is responsible for projects on water access and efficiency in drought-prone regions.

The Ministry of Environment and Energy (MINAE) is responsible for the design, development, evaluation and control of sector policies relating to climate change, including adaptation. Within MINAE, the **Directorate of Climate Change (DCC)** is the multi-sector co-ordinator in the formulation of policies, plans, programmes and projects focused on compliance with the National Climate Change Strategy.

The National Meteorological Institute (IMN) co-ordinates Costa Rica's meteorological and climatological activities. This includes the systematic monitoring of weather and research on issues such as climate variability and climate change.

The National Commission of Risk Prevention and Emergency Response (CNE) focuses on risk reduction (e.g. through early warning systems and infrastructure projects) as well as emergency response when a disaster occurs.

The Inter-Ministerial Technical Committee on Climate Change is an advisory body of MINAE. The Committee monitors the implementation of the National Climate Change Strategy, the National Climate Change Action Plan and other initiatives at the national and international level, and provides technical inputs for the implementation of proposed climate change policies. The Committee meets every one to two months.

The **Environmental Sectoral Council** recently replaced the Inter-Ministerial Council for Climate Change to support high-level political co-ordination on environmental issues including adaptation (preparation of Costa Rica's INDC, for example).

The **Sectoral Climate Change Commission** was established in 2016 to co-ordinate across the main agricultural institutions. Its role is still under development.

ANNEX 3.A3

Adaptation fund activities

Component 1: Agricultural sector

- Implementation of new farm zoning scenarios for selected communities, according to vulnerability.
- Identification of farming technology that can be adapted or implemented in order to enhance resilience to climate change (droughts, heat, intensive rain, plagues, and others) and the validation of technology by geographic areas.
- Implementation of validated farming technology for climate resilience enhancement.
- Creation of agricultural insurance policies and programmes, including criteria on climate resilience.
- Provision of access to revolving funds to agricultural producers to enable the implementation of sustainable management practices for lands, and the implementation of strategies to adapt to climate change and/or invest in new rural economic activities as contingencies against the impact caused by climate change.

Component 2: Sector water resources, coastal zones and fisheries

- Creation of water safety pilot plans at district and regional level to mitigate risks of water shortage or excess, and the implementation of irrigation management plans through an infrastructure vulnerability assessment.
- Development and implementation of Management Plans for selected watersheds.
- Implementation of measures to protect aquifer recharge areas.
- Planning and design of water use and distribution infrastructure to strengthen adaptation, modernisation and improvement and thus enhance climate resilience.
- Promotion of revolving funds to local water management associations, and national water systems to implement sustainable management practices for water.
- Design and implementation of coastal protection and restoration measures.
- Development of a comprehensive management plan for specific coastal marine resources and sustainable productive activities.
- Development and implementation of strategies for the preservation and recovery of mangroves.

Component 3: Capacity building

- Development and implementation of Early Warning Systems (SAT in Spanish) and district risk reduction plans.
- Provision of assistance to communities in the development of Early Warning Systems, district risk reduction plans.
- Stakeholder mapping and consultation to determine the level of awareness about climate change.
- Promotion and training in new rural economic activities due to the impact of climate change, including technical and financial considerations.
- The organisation of public information and awareness-raising programmes about the problem and measures to adapt to climate change in different vulnerability areas.
- Workshops among community organisations, professionals, technical groups, producers, and beneficiaries to exchange knowledge and experiences.
- Systematisation of lessons learned and good practices.
- Dissemination of information through printed, audiovisual and electronic means.
- Modernisation and expansion of the different hydrometeorological networks of the country through automated technological equipment and instrumentation.
- Development and adaptation of information systems of satellite imagery, integrated information systems for disaster risk management, systems of updated digital geographic and cartographic information for the analysis of threats and the reduction of impacts of hydrometeorological events.
- Creation of risk maps by using models for the development of future climate scenarios.
- Systematisation of information about climate variability by territory of interest/farming, water or coastal priority.

Source: Adaptation Fund (2014), pp. 79-82.

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Agricultural Policies in Costa Rica

These reviews provide comprehensive assessments, according to different angles, of countries' agricultural policies, including OECD estimates of the level of support; major reform efforts and their potential impacts; or conduciveness of the broad policy framework to generating the innovation that will improve agricultural productivity sustainably.

Costa Rica's strong agricultural sector is underpinned by the country's political stability, robust economic growth and high levels of human development. The sector has achieved significant export success, yet raising productivity and staying competitive in world markets will require efforts to address bottlenecks in infrastructure, innovation and access to financial services. Maximising Costa Rica's comparative advantage in higher-value niche products will depend upon more efficient services to agriculture, including better implementation of programmes, improved co-ordination among institutions, and reduced bureaucracy. While overall protection for agriculture is relatively low compared to OECD countries, it is nonetheless highly distorting to production and trade. Managing the transition to scheduled liberalisation presents an opportunity to reform costly policies, and to implement an alternative policy package with new investments in innovation, productivity and diversification, supported by transition assistance where needed. Costa Rican agriculture's vulnerability to extreme weather events is expected to worsen with climate change, and even while the country is among global leaders in environmental protection, sustainable development and climate change mitigation, further adaptation efforts will be necessary.

Consult this publication on line at ***http://dx.doi.org/10.1787/9789264269125-en***.

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