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OECD Environmental Performance Reviews: Costa Rica 2023

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Note by the Republic of Türkiye
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Note by all the European Union Member States of the OECD and the European Union
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Foreword

The principal aim of the OECD Environmental Performance Review programme is to help member and selected partner countries improve their individual and collective performance in environmental management by:

- helping countries assess progress in achieving their environmental goals
- promoting continuous policy dialogue and peer learning
- stimulating greater accountability from governments towards each other and public opinion.

This report reviews the environmental performance of Costa Rica for the first time since its accession to the OECD in 2021. Progress in achieving domestic objectives and international commitments provides the basis for assessing Costa Rica's environmental performance. Such objectives and commitments may be broad aims, qualitative goals or quantitative targets. A distinction is made between intentions, actions and results. Assessment of environmental performance is also placed within the context of Costa Rica's historical environmental record, present state of the environment, physical endowment in natural resources, economic conditions and demographic trends.

The OECD is grateful to Costa Rica's Ministry of Environment and Energy for providing information and comments, organising the review mission (27 November – 2 December 2022), as well as for facilitating contacts inside and outside government institutions. Thanks are also due to all government ministries and agencies, as well as non-governmental stakeholders, that participated in the missions and provided information or comments.

The participation in the review of the representatives of two examining countries, Ana Celia Salinas Martin (Colombia) and Cassandra Moll (New Zealand), is also gratefully acknowledged.

The authors of this report are Ivana Capozza (co-ordinator and main author), Olivia Cuq, Kathleen Dominique, Eugene Mazur and Maria Adelaida Rojas Lleras of the OECD Secretariat. Nathalie Girouard and Ivana Capozza provided oversight and guidance. Maria Adelaida Rojas Lleras provided statistical support, while Lydia Servant provided administrative support. Mark Foss copy-edited the report. Natasha Cline-Thomas provided communications support. Preparation of this report also benefited from inputs and comments from several members of the OECD Secretariat.

The OECD Working Party on Environmental Performance discussed the Environmental Performance Review of Costa Rica at its meeting on 14 April 2023 and approved the Assessment and Recommendations on 12 May 2023.

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Signs

The following signs are used in figures and tables:

.. : not available

– : nil or negligible

. : decimal point

Country aggregates

OECD Europe: This zone includes all European member countries of the OECD, i.e. Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

OECD: This zone includes all member countries of the OECD, i.e. the countries of OECD Europe plus Australia, Canada, Chile, Colombia, Costa Rica, Israel*, Japan, Korea, Mexico, New Zealand and the United States.

OECD LAC: This zone includes Latin American countries that are OECD members (Chile, Colombia, Costa Rica and Mexico) and candidate countries for accession to the OECD (Argentina, Brazil and Peru).

LAC: This zone includes 33 countries in Latin America and the Caribbean, namely Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

Country aggregates may include Secretariat estimates.

Currency

Monetary unit: Costa Rican Colon (CRC)

In 2022, USD 1 = CRC 647.1

In 2021, USD 1 = CRC 620.8

In 2020, USD 1 = CRC 584.9

In 2019, USD 1 = CRC 587.3

Cut-off date

This report is based on information and data available up to mid-April 2023.

Indicators

Internationally-comparable indicators presented in the OECD Environment at a Glance online platform support the analysis. They should be read in conjunction with this report.

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Basic statistics of Costa Rica

2021 or latest available year (OECD values in parenthesis)[a]

PEOPLE AND SOCIETY					
Population (million)	5.16	(1374)	Population density per km^2	101	(37)
Share of population by type of region:			Population compound annual growth rate, latest 5 years	1.1	(0.5)
Predominantly urban (%)	72	(49)	Income inequality (Gini coefficient)	0.49	(0.32)
Intermediate (%)		(28)	Poverty rate (% of pop. with less than 50% median income)	20	(11)
Rural (%)	28	(23)	Life expectancy	81	(81)
ECONOMY AND EXTERNAL ACCOUNTS					
Total GDP (National currency, billion)	40 113		Exports of goods and services (% of GDP)	37	(30)
Total GDP (USD, billion, current prices and PPPs)	117		Value added shares (%)		
GDP compound annual real growth rate, latest 5 years	2.5	(1.6)	Agriculture	5	(2)
GDP per capita (1 000 USD current PPPs)	23	(49)	Industry including construction	23	(24)
Imports of goods and services (% of GDP)	35	(30)	Services	73	(74)
GENERAL GOVERNMENT Percentage of GDP					
Expenditure	43	(46)	Education expenditure	7.6	(5.3)
Revenue	42	(39)	Health expenditure	6.1	(8.8)
Gross financial debt	68	(124)	Environment protection expenditure	0.4	(0.6)
Fiscal balance	-1	-(8)	Environmental taxes: (% of GDP)	2.3	(1.4)
			(% of total tax revenue)	9.8	(4.6)
LABOUR MARKET, SKILLS AND INNOVATION					
Unemployment rate (% of civilian labour force)	16	(6)	Patent applications in environment-related technologies (% of all technologies, average of latest 3 years) [b]	13	(11)
Tertiary educational attainment of 25-64 year-olds (%)	25	(40)	Environmental management	9	(3)
Gross expenditure on R&D, % of GDP	0.4	(2.7)	Climate change mitigation technologies	8	(10)
			Climate change adaptation technologies	0	(1.3)
ENVIRONMENT					
Energy intensity: TES per capita (toe/cap.)	0.98	(3.81)	Mean population exposure to air pollution ($PM_{2.5}$), µg/m^3	14.3	(13.9)
TES per GDP (toe/1 000 USD, 2015 PPPs)	0.05	(0.09)	Water stress (abstraction as % of available resources)	3	(7)
Renewables (% of TES)	51.5	(11.6)	Water abstraction per capita (m^3/cap./year)	668	(735)
Carbon intensity (energy-related CO_2):			Municipal waste per capita, (kg/capita)	313	(534)
Emissions per capita (t/cap.)	1.5	(8.3)	Material productivity (USD, 2015 PPPs/DMC, kg)	1.96	2.45
Emissions per GDP (t/1 000 USD, 2015 PPP)	0.08	(0.19)	Land area (1 000 km^2)	51	
GHG intensity: [c]			% of arable land and permanent crops	11	(11)
Emissions per capita (t/cap.)	2.9	(10.5)	% of permanent meadows and pastures	24	(23)
Emissions per GDP (t/1 000 USD, 2015 PPP)	0.16	(0.26)	% of forest area	59	(33)
			% of other land (built-up and other land)	6	(32)

a) Values earlier than 2016 are not taken into consideration. OECD value: where the OECD aggregate is not provided in the source database, a simple OECD average of the latest available data is calculated where data exist for a significant number of countries.
b) Higher-value inventions that have sought protection in at least two jurisdictions.
c) Excluding emissions/removals from land use, land-use change and forestry.
Source: Calculations based on data extracted from databases of the OECD, IEA/OECD, EUROSTAT and the World Bank.

Executive summary

Costa Rica has made good environmental progress, but could better align itself with more advanced countries

Costa Rica is globally known as a green country and ecotourism destination. It should be commended for reversing deforestation, producing all of its electricity from renewables and committing to net zero by 2050. The country has made some progress in delinking environmental pressures from its economic growth over the last decade. However, energy use and related greenhouse gas (GHG) emissions rose. Air quality is of concern in major urban areas. Increasing population, urbanisation and tourism have strained the undersized water, waste and transport infrastructure and services. Pressures on the environment are likely to grow with rising living standards and climate change.

Zero net deforestation is a major achievement, but biodiversity pressures persist

A megadiverse country, Costa Rica hosts diverse ecosystems and about 6% of the world's species. Its biodiversity supports the country's florid nature-based tourism, agriculture and fisheries. However, these activities, along with infrastructure development, pollution and climate change, exert pressures on biodiversity. The country's extensive protected area network and pioneering Programme of Payments for Environmental Services (PPSA) have helped curb biodiversity loss and extend forest cover to nearly 60% of land. However, land conversion to pastures, crops and urban areas has grown since the mid-2010s. Coastal areas, mangroves and other wetlands have deteriorated. Some marine resources are overexploited.

There is scope to strengthen coherence, implementation and effectiveness of biodiversity policy

Costa Rica has achieved or is on track to achieve most of the 100 targets of the National Biodiversity Strategy 2016-25. The planned update of the strategy is an opportunity to bring the multitude of biodiversity-related programmes and policy measures into a more consistent framework, reduce institutional fragmentation, and improve implementation and cost effectiveness. The strategy should also identify actions to mainstream biodiversity considerations in sectoral policies and reform harmful subsidies. Subsidies linked to production or use of inputs in agriculture and fishing could be replaced with time-bound payments targeted to vulnerable producers, as well as to further encourage sustainable farming and fishing practices. Pesticide use is high in Costa Rica. The recent regulation on agrochemical risk assessment is a step to better control its environmental and health impact.

The government acknowledges the urgent need to complete spatial planning and has taken initiatives to mainstream biodiversity in it. As of July 2021, less than half of municipalities had regulatory plans, with most of them outdated, partial and without an environmental assessment. The lack of land-use and marine

spatial plans is an indirect driver of biodiversity loss. It exacerbates Costa Rica's high vulnerability to climate-related natural hazards and pressures on coastal areas, which host much of the new tourism-related developments.

Costa Rica has expanded its officially protected areas to cover 25% of land and 30% of marine areas, well above the respective OECD averages. An extensive network of biological corridors ensures connectivity. There is scope to improve the ecological representativeness, management and funding of protected areas. Entrance fees are a large source of finance, but they should be systematically reviewed to ensure cost recovery. The use of concessions for tourism-related services in protected areas should be extended and made more efficient, to provide additional revenues, improve quality of services and engage local communities.

The long-standing PPSA has largely contributed to restoring degraded forestlands. Building on this successful experience, Costa Rica should promptly establish a coherent framework for reinforcing the PPSA and extending it to non-forest ecosystems, in recognition of the valuable services they provide. Fuel tax revenue accounts for nearly 90% of the PPSA funds. The government should further broaden the sources of finance for the PPSA, with a view to delinking its financial viability from fuel tax revenue, which is expected to decline with the progressive shift to electric transport.

More investment in water and waste infrastructure and services is urgently needed

Water governance has advanced. However, the country needs to accelerate and scale up investment in water infrastructure to expand access to water and sanitation services, extend wastewater treatment and reduce water losses. In 2020, only 30% of the population had access to safely managed sanitation. Three-quarters of households collected their wastewater with septic tanks, which are not regularly monitored. Much wastewater is untreated, resulting in contamination of soil and water bodies.

Costa Rica has made some progress in material recycling, including through several extended producer responsibility schemes. However, waste disposal relies on landfills, with only 7% of waste being recovered (in 2021). Less than half of households properly sort their waste – a major barrier to recycling. The quality of waste management services varies widely across municipalities. Collection fees often do not incentivise waste sorting or cover operating costs, let alone investment in treatment infrastructure. More waste prevention actions are also needed. While low in international comparison, generation of municipal waste has gradually increased since 2016. The ongoing development of the National Circular Economy Strategy aims to address these challenges.

Costa Rica needs to follow through on plans to meet its ambitious climate goals

Costa Rica developed a comprehensive National Decarbonisation Plan (PND) to achieve carbon neutrality by 2050 – one of the few Latin American countries to do so. It set a 2030 target in line with this goal. Further expanding and diversifying renewable electricity sources will be crucial to sustain the electrification of transport, industry and buildings, which is a pillar of the PND. This requires upgrading electricity grids and improving the operating efficiency of power systems. Costa Rica has advanced in rolling out smart meters. However, economic incentives and more stringent energy performance standards are needed to tackle energy use and GHG emissions from transport and buildings. GHG emissions from fuel combustion grew by 11% in 2010-21. Still, net GHG emissions declined (by 13% in 2010-17) thanks to increased carbon removals by forests.

Decarbonising transport is essential to meet climate mitigation goals and improve quality of life

Costa Rica heavily relies on road transport, which accounts for three-quarters of energy-related GHG emissions. GHG emissions from road transport grew by over 30% in the last decade. Road vehicles are also a major source of air pollutants. More than 88% of the population is exposed to harmful levels of air pollution. The vehicle fleet has grown rapidly in the last decade, but most vehicles are over ten years old. Vehicle emission standards are lenient and weakly enforced.

The PND aims to radically increase the role of public transport, cycling and walking in mobility patterns. This is welcome. Actions have been taken to better integrate land-use and transport planning, but progress has been slow. The Greater Metropolitan Area (GAM), where most people live, has no integrated public transport system.

Costa Rica has expanded the charging network for electric vehicles (EVs) and adopted regulations and fiscal incentives to encourage their purchase. The number of EVs has increased in the last few years, but it represents a negligible share of the fleet. EV purchase subsidies should be combined with stringent vehicle standards and higher taxation of conventional vehicles. As in other emerging economies, encouraging the use of electric two/three-wheelers and urban buses would be more cost effective. Investing in an extended, integrated and electricity-based public transport would help reduce car dependence and avoid exacerbating inequality.

The environmental governance system is well established, but implementation could be improved

Costa Rica has comprehensive environmental policy and legal framework and well-developed mechanisms of environmental democracy. It has shown continued commitment to aligning its legislation and practices with OECD standards. However, a fragmented governance, limited institutional capacity and resource constraints have hampered effective implementation. The country should build on the 2022 bill that strengthens the environment ministry's purview to streamline environmental governance. The financial and administrative capacity of local governments should be strengthened so they can deliver quality environmental and mobility services. Costa Rica should swiftly complete and implement the reform of environmental assessment and permitting, which would bring it in line with OECD best practice. Collection and dissemination of environmental information have markedly improved. However, more work is needed to fill persistent information gaps – including on GHG emissions, waste, air and water quality, and oceans – to inform decision making and engage citizens.

Costa Rica should scale up finance for environment-related investment and improve efficiency of public spending

Public environment-related spending does not seem commensurate with Costa Rica's goals. Human resources are insufficient to ensure adequate environmental planning, management and enforcement. There is a need to reallocate resources to address infrastructure gaps, ensure the climate resilience of physical assets and improve service delivery. The scale of investment needed to implement the PND 2018-50 and achieve the Sustainable Development Goals is daunting. It calls for improving the quality and efficiency of public management and spending, engaging the private sector, mobilising alternative sources of finance, strictly enforcing regulations and providing adequate incentives. Costa Rica can build on its environmental reputation and experience with conservation trust funds, debt-for-nature swaps, green bonds and REDD+ to attract international green finance.

Implementing a green tax reform would help improve price signals and raise revenue for the green transition

At 10% of total tax revenue, environment-related taxes are an important source of fiscal revenue in Costa Rica, especially because of low proceeds from income taxes. Fuel taxes are higher than in many Latin American countries, while subsidies are lower. Still, less than half of the country's GHG emissions face fuel taxation. Costa Rica should adopt a green tax reform and carbon pricing, as commendably outlined in the PND. It should review taxes on fuels and vehicles to better reflect the social costs of their use and encourage a shift towards cleaner vehicles and sustainable transport modes. It should also raise road tolls, which have been unchanged since 2002. Implementing congestion charges would help curb peak-time congestion in critical areas of the GAM in a cost-effective and socially fair manner.

The gradual removal of fuel tax concessions and other environmentally harmful subsidies should be a priority. Increasing allowances for poorer households is a preferable way to shield the population most affected by high energy prices. Costa Rica could build on the finance ministry's regular stocktaking of tax expenditure to develop a subsidy reform plan. Revenues for environmental taxes and subsidy removal could help finance the transition to a greener economy. Well-targeted and transparent policies for using these additional revenues will be key to improve social acceptability of reforms.

Assessment and recommendations

The Assessment and Recommendations present the main findings of the OECD Environmental Performance Review of Costa Rica. They identify 52 recommendations to help the country make further progress towards its environmental objectives and international commitments. The OECD Working Party on Environmental Performance discussed and approved the Assessment and Recommendations on 12 May 2023.

1. Environmental performance

The economy has grown strongly in the last decade, but social and environmental outcomes have been uneven

Costa Rica has earned a worldwide image of a green and sustainable country. Its environmental and natural resources are a pillar of the country's development model. The economy grew faster than on average in Latin America and the Caribbean (LAC) and the OECD in the last 20 years, underpinned by openness to trade and foreign direct investment (OECD, 2023[1]). However, Costa Rica's per capita income remains less than half the OECD average. Despite significant social advances, poverty and inequality are persistently high, and about 45% of employment is informal (INEC, 2022[2]; OECD, 2023[3]). The population grew to reach about 5.2 million inhabitants in 2022. Urbanisation has intensified, with the Greater Metropolitan Area (GAM) around San José hosting about 73% of the population.[1] Increased population, urbanisation and tourism have been straining water, waste and transport infrastructure and services.

Costa Rica is known globally as the first tropical country to have reversed deforestation (Section 3). It produces all its electricity from renewable energy sources. The country has made some progress in decoupling environmental pressures from its fast economic growth. Energy use, greenhouse gas (GHG) emissions and domestic material consumption continued to increase but at a slower rate than gross domestic product (GDP) in the last 15 years. However, other pressures, such as waste generation, nitrogen oxides (NO_x) emissions, nitrogen balance and water abstractions grew in line with or faster than GDP (Figure 1). In addition, the reforestation rate has declined in recent years (Section 3). Pressures on the environment are likely to increase with rising income and consumption, population, urbanisation, tourism, energy use and transport demand. Further efforts are needed to consolidate results and reinforce decoupling trends to meet the country's climate mitigation target and the Sustainable Development Goals (SDGs) to 2030.

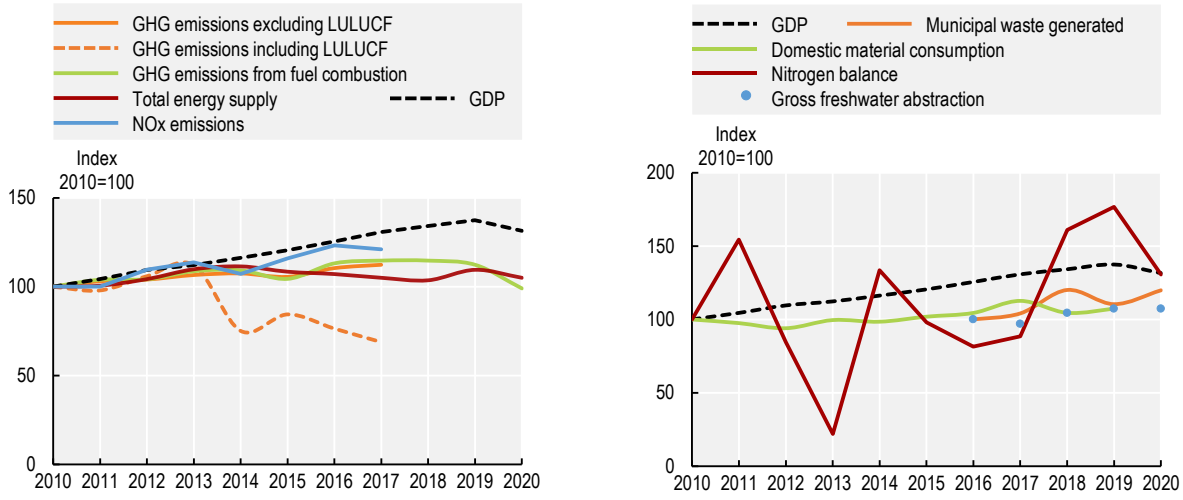
Efforts to build resilience to climate change impact have intensified but more investment is needed

Costa Rica is highly vulnerable to the consequences of climate change. Some key agricultural regions are exposed to both drought and extreme rainfall. About one-third of the country's forest-covered areas is at high risk of wildfires (IEA/OECD, 2023[4]). The lack of adequate land-use plans and urban planning exacerbates the impact of natural disasters on infrastructure and settlements, increasing the population's vulnerability to climate-related events (Section 3). Nearly 80% of the population live in areas at high risk from multiple hazards, including those related to climate (World Bank Group, 2021[5]). The National Adaptation Policy 2018-30 indicates the costs of climate-related extreme weather events could reach 1.6-2.5% of GDP by 2025, including costs to repair damaged water and transport infrastructure.

Nature-based solutions (NbS) are among the main lines of action of the National Climate Change Adaptation Plan (PNACC) 2022-26. This is welcome as NbS – including the sustainable management of forest, marine and freshwater ecosystems – may be more cost effective and flexible than traditional approaches such as "grey" infrastructure. Further extending the use of NbS would provide multiple benefits, including reducing GHG emissions and biodiversity loss, as well as creating employment and income opportunities for local communities. However, additional investment will be needed to build climate-resilient infrastructure, retrofit existing infrastructure and protect the most vulnerable communities and ecosystems. In 2021, the Ministry of Environment and Energy (MINAE) released three technical guidelines to support local governments in developing their plans to prepare for and adapt to climate change impacts.

Figure 1. Costa Rica has made progress in decoupling some environmental pressures from economic growth

GDP and selected environmental indicators, index 2010=100, 2010-20.



Note: GDP = gross domestic product; GHG = greenhouse gas; LULUCF = land use, land-use change and forestry; NO_x = nitrogen oxides. Data for GHG emissions and NO_x emissions are available until 2017.
Source: IEA (2023), *IEA World Energy Statistics and Balances* (database); OECD (2022), "OECD Economic Outlook No 112 (Edition 2022/2)", *OECD Economic Outlook: Statistics and Projections* (database); OECD (2022), *Environment Statistics* (database); SINAMECC (2020), Inventario Nacional de Gases de Efecto Invernadero.

StatLink https://stat.link/eyno7w

The PNACC acknowledges the urgent need to generate robust information on climate and hydrological risks and impacts, as well as to enhance the institutions' capacities to develop adaptation measures based upon scientific knowledge. Some progress has been made with establishment of the national system to monitor climate change (SINAMECC), which also maps adaptation actions. This system could provide the basis for monitoring the effectiveness of adaptation actions. Improved collaboration with the private sector, scientific institutions and local communities would help generate quality information to support climate adaptation policy and raise public awareness.

Costa Rica needs to strengthen the policy mix to achieve its ambitious climate targets by 2030 and 2050

Forests have helped mitigate growing GHG emissions from other sectors

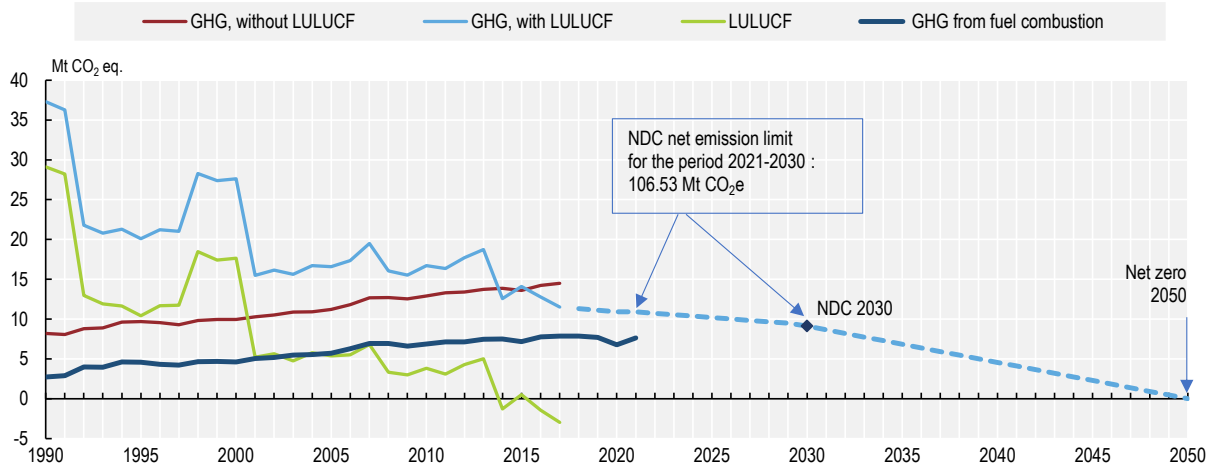
Costa Rica's GHG emission profile differs from that of most other OECD countries. Thanks to its zero-emission power generation mix, GHG emissions from energy industries are a minor share of total emissions. Transport, nearly exclusively by road, is the largest emission source making up 42% of emissions in 2017.[2] Agriculture accounted for 20% of emissions, reflecting its large economic role. Waste management followed with 15% of total emissions due to the reliance on landfills for disposal (see below).

According to International Energy Agency (IEA) data, GHG emissions from fuel combustion have continued to increase since 2000, although at a lower rate than GDP, with a drop in 2020 due to the pandemic

(Figure 2). Emissions from road transport grew by over 30% in 2010-19 (OECD, 2023[6]). Overall, Costa Rica's gross GHG emissions (i.e. excluding land use, land-use change and forestry, or LULUCF) grew by 12% in 2010-17. However, when considering LULUCF, net GHG emissions declined by 13% in the same period. This trend is the result of increased carbon removals by forests thanks to a zero net deforestation rate in 2012-19 (Figure 2). The long-standing Programme of Payment for Environmental Services and the network of protected areas have been key to achieving this outcome. These are also the pillars of the Costa Rica strategy for reducing carbon emissions from deforestation and forest degradation (REDD+) (Section 3).

Figure 2. Costa Rica aims to be carbon neutral by 2050

Historical and projected GHG emissions, targets and pathways to targets.



Note: GHG = greenhouse gas; LULUCF = land use, land-use change and forestry; NDC = Nationally Determined Contribution. Net GHG emissions include those from the LULUCF sector. Data on GHG emissions from fuel combustion are produced by the International Energy Agency (IEA).
Source: OECD (2023), *IEA CO_2 Emissions from Fuel Combustion Statistics: Greenhouse Gas Emissions from Energy*; MINAE (2020), Contribución Nacionalmente Determinada 2020; SINAMECC (2020), Inventario Nacional de Gases de Efecto Invernadero.

StatLink https://stat.link/td3j92

Climate mitigation action has improved, but the policy mix is limited in scope and stringency

Costa Rica has intensified its efforts to curb emissions from energy use in the last decade. However, the range of implemented policies targeting emissions from industry, building and transport is limited and not sufficiently stringent.[3] In addition, information gaps persist, with the national GHG emission inventories being released with a time lag of several years. At the time of writing, Costa Rica was updating the GHG emission inventory and preparing its reporting obligations under the Paris Agreement.

The climate policy mix relies heavily on regulations and voluntary approaches (rather than markets) and governance tools (such as target setting and reporting). Market-based instruments are limited to fuel taxes, which apply mainly to the transport sector (Section 2). Measures in the buildings and industry sectors focus on energy performance standards and labels. Policies in the agriculture sector focus on encouraging innovation, as well as on training and assisting farmers to adopt practices that can reduce GHG emissions.

These include two Nationally Appropriate Mitigation Actions (NAMAs) for coffee production and livestock (Section 3). Another NAMA aims to curb emissions from waste disposal. The Sustainable Landscape Initiative 2022-30 builds on guidance and voluntary measures to reduce emissions from agriculture,

forestry and other land uses in line with Costa Rica's commitment under the 2021 Glasgow Declaration on Forests and Land Use.

Costa Rica has raised its ambition towards a net-zero economy

The updated Nationally Determined Contribution (NDC) commits the country to keep its cumulative net GHG emissions within 106.53 million tonnes of carbon dioxide equivalent ($MtCO_2eq$) in 2021-30, and to reach 9.1 $MtCO_2eq$ in 2030 (equivalent to about 20% below its 2017 level). The 2030 target is in line with the pathways to reach the 2050 net-zero goal, as set by the National Decarbonisation Plan (PND) 2018-50 (Figure 2).

Costa Rica is among the few LAC countries that submitted detailed long-term strategies to achieve the net-zero goal. The PND, based on extensive public consultations, is more ambitious and comprehensive than previous plans and strategies. It lays out priorities to decarbonise the economy and the policy and institutional reforms needed to achieve them (e.g. a green fiscal reform, see Section 2). Key objectives include electrification of transport; increased public transport use; upgraded electricity grids; improved energy efficiency; increased waste recycling and composting; completion of the sewer system coverage; and improved farming practices. Continuing to increase forest coverage plays a key role in the country's net-zero strategy (Section 3). Costa Rica met most of the targets of the first PND implementation phase, which ended in 2022. However, the targets related to transport and waste were missed.

To reach its 2030 NDC and carbon neutrality goal by 2050, Costa Rica needs to address planning, regulatory and political economy barriers, in addition to securing the necessary funding. Achieving the PND targets would require massive investments, estimated at USD 37 billion in 2020-50, and would provide more than USD 40 billion in net benefits (Groves et al., 2020[7]). Implementing the PND would also yield numerous co-benefits, including health improvements from reduced pollution, fuel cost savings from electrification, and ecosystem services from preserved and enhanced forests. Engaging the private sector and mobilising alternative sources of finance are of paramount importance (Section 3).

Sourcing power from renewables helps decarbonisation, but reducing energy consumption is a priority

Costa Rica has made important strides towards the clean energy transition…

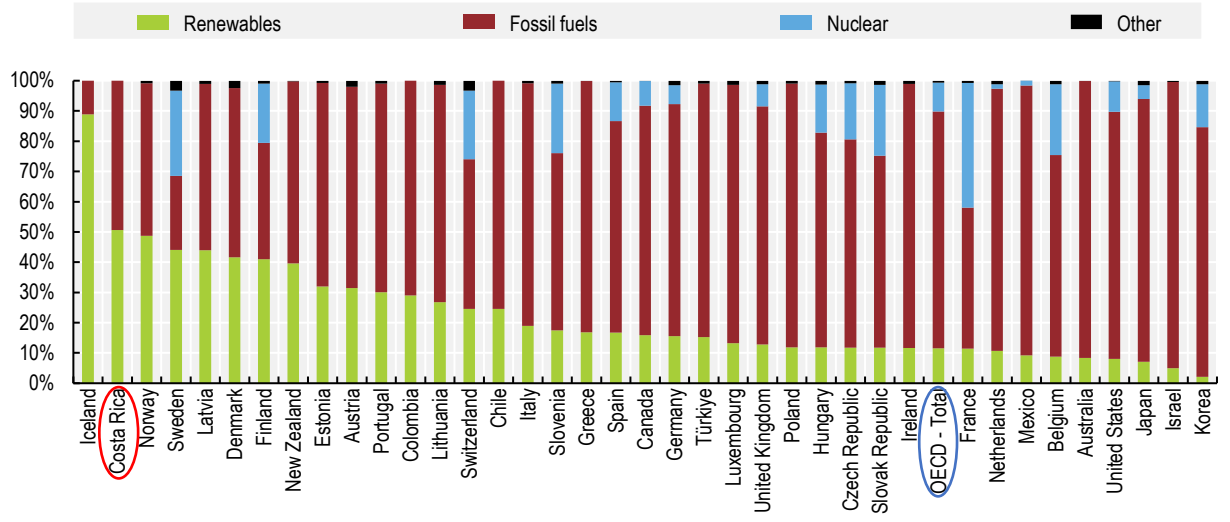
The country's electricity generation has been fully sourced from renewables, mostly hydropower, since 2015. Overall, renewables hovered around half of total energy supply in the last decade, well above the OECD average.[4] However, half of energy supply is still based on fossil fuels, mostly oil used for transport (Figure 3).The government plans to expand production and use of biofuels from agricultural organic waste to replace transport fuels. In 2019, the government suspended oil exploration and exploitation projects on its territory until 2050.

Expanding and diversifying the renewable electricity generation capacity will be crucial to maintain clean electricity generation and decarbonise energy use. Electrification of transport, industry and buildings is a pillar of Costa Rica's PND and of the National Energy Plan 2015-30. With its large renewable power base, Costa Rica is also in a good position to produce and deploy green hydrogen to fuel transport vehicles and industry. In line with the net-zero goal, electricity demand is expected to increase nearly four-fold by 2050.

While the country has an excess electricity generation capacity, climate change is projected to severely affect hydropower production by the end of the century (IEA, 2021[8]). In addition, most of the remaining potential from hydro and geothermal power is in protected natural areas or on indigenous land. Power generation capacity from wind and biomass has increased in recent years. Further diversifying the renewable electricity mix will require upgrading electricity grids and improving the operating efficiency of power systems to integrate rising generation from variable renewable sources. It is essential to lighten regulatory barriers such as the restrictions on private sector participation and foreign ownership to encourage investment and innovation in the sector (OECD, 2023[1]). Legislation to remove these restrictions was under development at the time of writing.

Figure 3. Costa Rica is a leader in using renewables

Total energy supply by source, OECD countries, 2021.



Note: Values exclude electricity trade.
Source: IEA (2022), "World energy statistics", *IEA World Energy Statistics and Balances* (database).

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… but greater effort is needed to improve energy efficiency

Energy consumption trends are a concern, especially in the transport, residential and commercial sectors. Measures to improve energy efficiency have been limited. They include minimum energy performance standards (MEPS) or labels for some appliances and industrial motors, as well as some fiscal incentives to purchase high-efficiency equipment. There are no MEPS for buildings, but voluntary labelling for sustainable buildings has been implemented since 2020. A regulation for sustainable social housing, including energy efficiency parameters, was under development at the time of writing. Costa Rica is on track to achieve the target of 1 million smart meters installed by 2026 (or about 60% of households) set by the National Strategy for Smart Grids 2021-31.[5] Smart metering will also help consumers understand their energy use and adapt their consumption to prices. Yet, a broader set of regulatory, fiscal and education measures is needed to encourage energy savings.

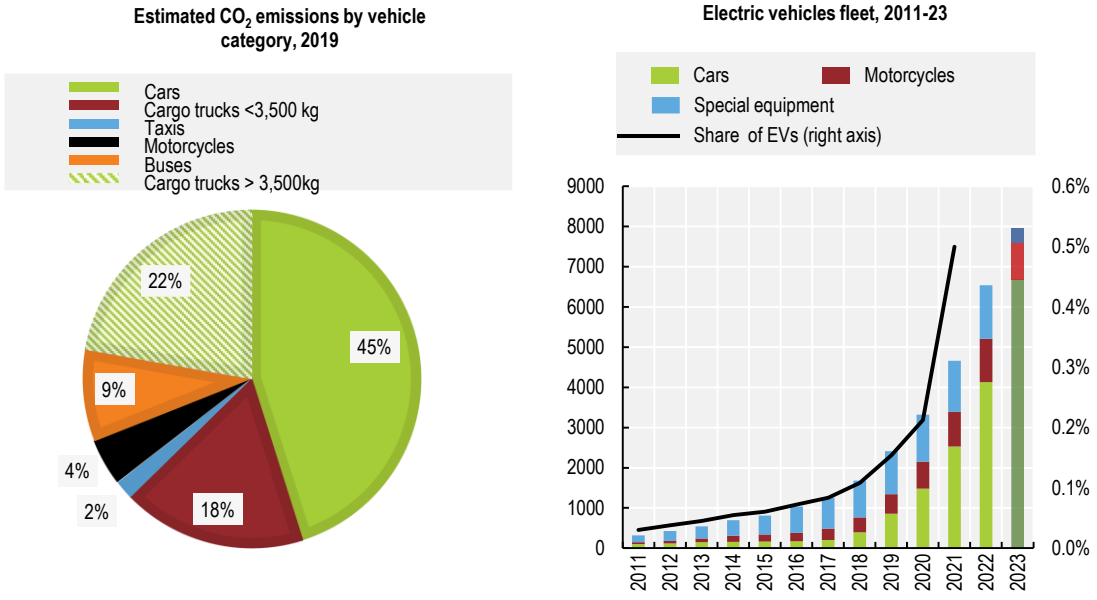
Decarbonising transport is essential to meet national climate mitigation goals and improve quality of life

Costa Rica's heavy reliance on road transport has led to rising environmental pressures

Energy use for road transport and related GHG emissions grew by over 30% in 2010-19 (before dropping with the pandemic). Transport, nearly exclusively by road, was close to half of total energy consumption and three-quarters of GHG emissions from fuel combustion in 2020 (OECD, 2023[6]). Road vehicles are also a major source of other air pollutants such as carbon monoxide (CO), hydrocarbons, NO_x and fine particulate matter (PM) (see below). Private cars account for most of fuel use and related emissions (Figure 4). The vehicle fleet has grown by about 60% in the last decade, but most vehicles are over ten years old.

The road network is extensive and has received the bulk of land transport funding in the last decade. However, quality of road infrastructure is generally poor, suffering from years of underspending on maintenance due to weak governance, planning and execution (Section 2). Inadequate public transport services, chaotic building development and poor road design and quality have led to heavy congestion on the main national roads and in the GAM. Driving restrictions based on licence plates have been the only tool to manage congestion and air pollution in the capital city of San José, with little effectiveness.

Figure 4. A massive electrification of road vehicles is required to help reduce CO_2 emissions



Note: 2023 data on electric vehicles fleet correspond to projections. The category of special equipment vehicles includes golf carts, quadricycles, forklifts and work trolleys, all with number plates.
Source: CONARE (2020), *Informe Estado de la Nación 2020*; MINAE (2022), Vehículos eléctricos en Costa Rica, Dirección de Energía.

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Decarbonising transport requires changes in mobility patterns and land-use planning

Improving public transport, as well as walking and cycling conditions, is of outmost urgency to reduce car dependence and extend access to employment and social opportunities. The PND aims to reach 32.5% of passenger travels covered by public transport by 2035 (from 25% in 2018). It also seeks to increase the share of travels by walking and cycling to 4% by 2035. Roads are mostly not safe for walking and cycling due to the lack of sidewalks and bicycle lanes. Historically, settlements have developed in an unplanned manner and without considering access to public transport. Urban areas are sprawling, with much of the new built area at their fringes. On average, settlements built between 2016 and 2019 were nearly 2 kilometres from a bus stop (compared to a commonly accepted walking distance of 400-500 metres), with a large variability between the GAM and rural zones (CONARE, 2021[9]).

In the GAM, heavy congestion affects public transport performance and attractiveness. The share of passenger travel by buses has declined over time in the metropolitan area (from 41% to 34% between 2007 and 2017). Urban and interurban railways services are limited. The GAM has no integrated public transport system, with most bus lines passing through San José city centre and interconnecting only there, if at all. Nearly 90 private bus companies operate based on concession contracts. Frequency of buses is inadequate to serve demand, especially at the outskirts of the metropolitan areas, where most low-income people live.

In the last few years, actions have been taken to modernise bus transport in the GAM and improve walkability and cycling conditions. These include setting priority bus lanes and assigning some bus concessions by sector (area) of the city rather than by route. In 2020, the Ministry of Public Infrastructure and Transport launched a plan to implement an integrated public transport system in the GAM. However, progress has been slow and fragmented. The experience of other countries shows that establishing metropolitan transport authorities can help co-ordinate planning, investment and operation of transport infrastructure and services across neighbouring municipalities.

Efforts to electrify transport are welcome, but they should prioritise public transport to help reduce car dependence and avoid regressive impacts

The PND puts great emphasis on electrifying public and private transport. It aims to achieve 30% of electric vehicles (EVs) in the fleets of both buses and light vehicles (including cars) by 2035, and much higher shares by 2050. The number of EVs has increased in the last few years, but it still represented 0.5% of the vehicle fleet in 2021 (Figure 4). Costa Rica shares with other emerging economies some challenges to develop electromobility, including weak electricity grids and reliance on second-hand vehicles (IEA, 2022[10]). The government has put in place the regulatory framework for EV promotion and installation of the charging network. Private EVs benefit from several tax exemptions and other incentives such as green plates and free parking spaces. The experience of the leading EV markets shows that EV purchase subsidies should be combined with stringent vehicle efficiency and/or CO_2 standards – which Costa Rica lacks – and higher taxation of internal combustion engine vehicles (Section 2).

As in other emerging economies, electrification of road transport should prioritise two/three-wheelers and urban buses, which are the most cost-competitive vehicle categories (IEA, 2022[10]). As lower-income households rely on public transport for their mobility needs, investing in an extended, integrated and electricity-based public transport would help reduce car dependence and avoid exacerbating inequality.

Steps have been taken in this direction with the piloting of electric buses on two routes in the GAM. High investment and maintenance costs and lax emission standards are among the main barriers to the uptake of electric buses.

A large part of the population is exposed to air pollution, posing risks to human health

Emissions of most air pollutants have grown over the last 20 years in Costa Rica. Energy use, especially in road transport, accounts on average for 70-95% of total emissions of air pollutants. NO_x emissions from transport have almost doubled since 2000. The impact of the vehicle fleet on air pollution in the GAM is significant. Motorcycles are a major source of CO and hydrocarbon emissions. Vehicle emission standards are lenient. The entry into force of stricter Euro 6 or Tier 3 emission standards was postponed to 2027. Many vehicles continue to circulate even after failing the mandatory technical inspections (which also checks engine emissions) due to lax enforcement.

Air quality limits are set in legislation, but there is no penalty for exceeding them. More than 88% of the population is exposed to harmful levels of air pollution (OECD, 2023[11]). Average annual concentrations of PM are above the OECD average. Since 2013, when the GAM started monitoring $PM_{2.5}$, the annual average concentration at all sites has always been above 15 micrograms per cubic metre ($\mu g/m^3$), exceeding the 2021 World Health Organization Air Quality Guidelines of 5 $\mu g/m^3$ (MoH et al., 2020[12]). This poses a risk to human health. The average number of premature deaths caused by $PM_{2.5}$ exposure increased slightly during the last decade in Costa Rica (OECD, 2023[13]).

The lack of data on air emissions and quality is of serious concern and hampers the country's ability to take informed policy decisions. The monitoring network is too limited to generate sufficiently frequent and consistent data on air quality and exceedances of thresholds. Expanding capacity for air quality monitoring will help improve systems to warn the population of high exposure to air pollution. Some progress has been made to disseminate information on air quality with development of a webpage and mobile application.

Waste management needs to be improved to move towards a circular economy

Waste infrastructure and services are inadequate to address rising waste flows

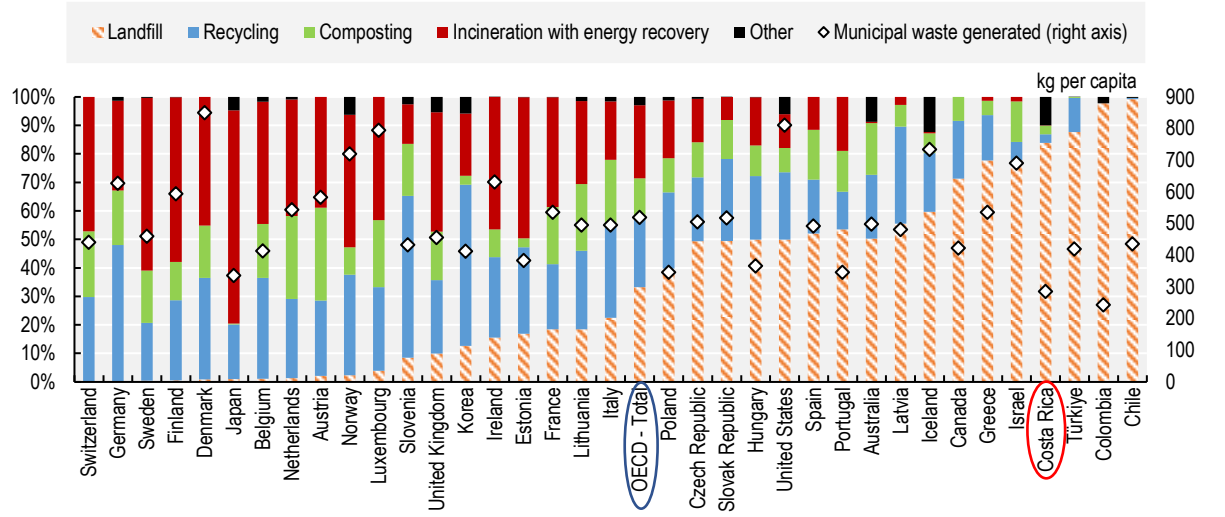
Generation of municipal waste is among the lowest in the OECD but has gradually increased since 2016. It is likely to grow further with the expected increase in population and income. Costa Rica still relies on landfills for waste disposal, more than most other OECD countries (Figure 5). Despite progress in closing illegal dumpsites, waste disposal in inappropriate sites remains considerable, especially in some rural regions. Nearly 10% of households still burn or bury their waste (INEC, 2022[14]). This waste, including lots of plastics, ends up in fields, rivers, wetlands and oceans. Estimates indicate that, due to illegal disposal, the actual amount of waste generated could be some 25% higher than shown in official statistics. All this calls for urgent action to increase waste collection, sorting and recovery to divert waste from landfills, as well as to improve waste data collection. Enhancing circularity will also contribute to abate GHG emissions, given the large share of emissions generated by the waste sector (see above).

Waste collection rates vary widely across municipalities, which are responsible for waste management. About 80% of municipalities have the integrated waste management plan required by law. However, many municipalities lack the financial and administrative capacity to invest in waste treatment infrastructure and provide sound waste management services. Only 24 municipalities offer separate waste collection services with a limited coverage of their resident households (CGR, 2021[15]). Consequently, less than half of households in the country properly separate their organic waste, glass, plastics, cardboard and aluminium.

Incentives are needed to encourage timely waste collection, sorting and recovery beyond the deterrent of fines for non-compliance. In most municipalities, waste collection fees do not cover the costs of the service and are not structured to incentivise waste sorting. Municipalities could improve waste service delivery and encourage job creation by integrating informal waste pickers and public-private initiatives such as "*Ecoins*" into their waste management plans.[6] Costa Rica has launched education campaigns on waste sorting and recycling in schools. This is a step in the right direction, but broader and more regular education, training and awareness-raising campaigns are needed to encourage households and businesses to change behaviours.

Figure 5. Costa Rica has one of the highest shares of landfilled waste in the OECD

Municipal waste treatment and generation, OECD countries, 2020 or latest available year.



Note: Other recovery includes refuse-derived fuel, waste used for backfilling, process loss from mechanical biological treatment facilities, incinerator bottom ash sent for recycling, metals from incineration sent for recycling. Other disposal includes waste treated/disposed of through other unspecified treatment processes, as well as process and moisture loss.
Source: OECD (2023), "Municipal waste, generation and treatment", *OECD Environment Statistics* (database).

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Despite recent progress, barriers to increasing waste recovery remain

With adoption of the 2010 Integrated Waste Management Law, Costa Rica established the policy and regulatory framework for integrated waste management, setting targets on waste prevention and recovery. It has made efforts to increase the recycling rate of materials. Plastics and metals are recovered and exported. Extended producer responsibility schemes cover 14 types of products. However, they do not cover major waste streams (e.g. construction waste, packaging) and lack compulsory recovery targets (Soto Córdoba, 2019[16]). In 2021, only 7% of total waste generated was recycled or composted, far below the OECD average (Figure 5) and the 15% waste recovery target set in the 2016-21 National Strategy for Waste Separation, Recovery and Valorisation.

Poor waste sorting and the lack of demand for, and low prices of, recovered materials are among the main factors limiting the country's recovery and recycling rates. Incentives for use of recovered and recycled

materials as inputs in production processes are needed to develop a domestic market. Work is in progress to update the National Waste Management Plan and develop the National Circular Economy Strategy, with a view to preparing Costa Rica's transition towards a circular economy. The government has been promoting the principles of the circular economy in local governments and businesses through technical guidelines, organisational standards and training.

More investment in water infrastructure is urgently needed to deliver access to services and improve water quality

Improving water quality and reducing high water losses are major challenges

Costa Rica benefits from abundant freshwater resources, but high levels of water losses from public water supply and irrigation networks are problematic. Freshwater withdrawals have steadily increased in 2010-20, although abstractions as a share of total renewable resources remain below the threshold for water stress. Water losses as a share of total withdrawals for irrigation sharply declined in 2018, but they were still 40% in 2021. For public water supply, water losses remained relatively high over the period, rising to just over 65% in 2021, underscoring the need for renewal and upgrading of ageing infrastructure. The Non-Revenue Water Reduction and Energy Efficiency Optimisation Project diagnosed challenges related to water losses and developed an action plan to address them.

Water pollution and deterioration of water quality in rivers are among the major environmental challenges in Costa Rica (CONARE, 2022[17]). Monitoring of water quality remains at early stages and is not sufficient to provide an accurate and comprehensive understanding of the state and evolution of water quality. Most river basins are monitored, but many water bodies only have a few monitoring sites and data are not collected consistently across sites and pollution parameters. Enforcement of violations of wastewater discharge standards should be strengthened. In many cases, inspections are a reaction to pollution incidents or complaints (Section 2). Sanctions imposed for non-compliance should be increased.

Investment in water infrastructure lags far behind, and new approaches to financing are needed

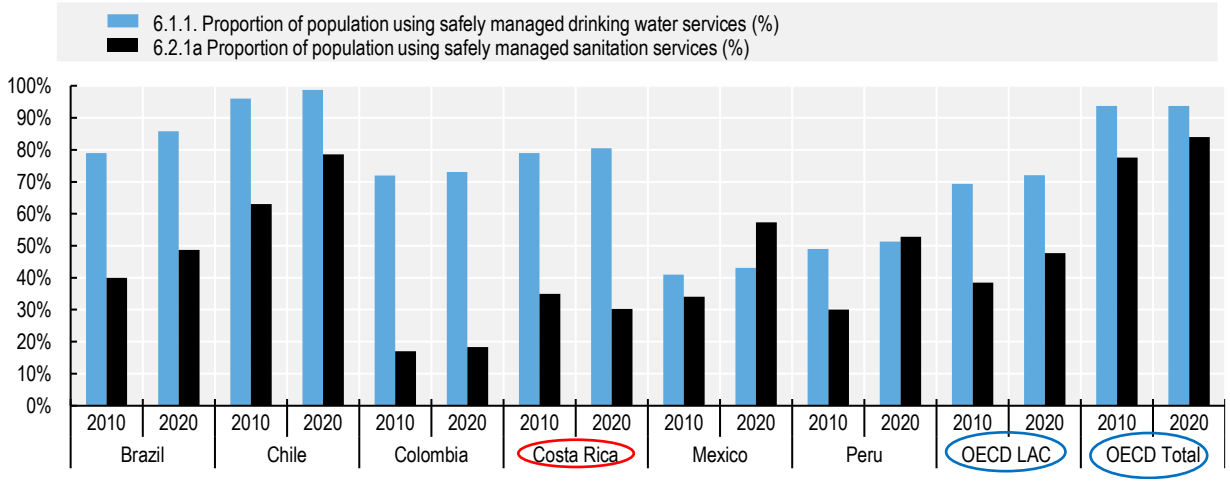
There is an urgent need to scale up investment to expand water and sanitation services, and wastewater treatment; upgrade public water supply and irrigation networks; and ensure resilience to the impacts of climate change. In 2020, about 80% of the population benefited from access to safely managed drinking water,[7] although progress to increase access has stagnated (Figure 6). Access to safely managed sanitation has deteriorated from 35% of the population with access to such services in 2010 to 30% in 2020 (UNICEF, 2023[18]). The lack of wastewater treatment is also a major issue, with implications for public health and water quality. Only about 15.5% of the sewage collected receives some type of treatment (CONARE, 2022[17]), a low share compared to OECD countries and others in the region. A large share of wastewater from homes and industries flows into rivers without treatment. The majority of Costa Rica's population has independent wastewater treatment (septic tank), while 24% are connected to a public sewage collecting network and less than 10% to public wastewater treatment plants . Septic tanks usually only capture a small share of wastewater from households (mainly sewage), while the remaining wastewater drains into water bodies untreated. Further, the construction, operation and maintenance of septic tanks are not supervised (MINAE, 2013[19]). Unless carefully managed and monitored, septic tanks can leak into the soil and groundwater, resulting in contamination.

Costa Rica has a dedicated programme to scale up investment in sanitation and wastewater treatment. However, the pace and scale of investment are not commensurate with the investment needed to reach the target of universal coverage. The 2016 National Wastewater Sanitation Policy (PNSAR) set an

objective to achieve, by 2045, the safe management of all wastewater generated in the country. However, under business as usual, only about 15% of the population will be connected to public wastewater treatment systems by 2045, far from the 100% target in the PNSAR. If existing plans are executed, coverage is estimated to reach 38% (CONARE, 2021[9]).

Figure 6. Access to drinking water has marginally improved while access to sanitation services has deteriorated

Progress assessment of SDG 6 "Clean water and sanitation", selected LAC countries, 2010-20.



Note: Indicator 6.1.1 refers to the population that is supplied with intra-domiciliary water from an aqueduct; Indicator 6.2.1a refers to the population that lives in dwellings with a sanitary service connection to sewers or a septic tank.
Source: CTIE-Agua (2021), Estadísticas e Indicadores Claves para la Gestión Integrada de Recurso Hídrico, Comité Técnico Interinstitucional de Estadísticas del Agua; WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (2021).

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Costa Rica uses economic instruments to manage the quantity and quality of water, which contribute to cost recovery of water services and funding for water management. The Water Utilisation Levy applies to water use, with different rates according to type of use and source. The Water Discharge Levy applies to wastewater discharge based on discharged loads of chemical oxygen demand and total suspended solids. The amount for each pollution parameter is adjusted annually to reflect inflation. Both levies could be adjusted to better apply the user-pays and polluter-pays principles. Water supply and sanitation tariffs should also reflect the full cost of service provision, with targeted social measures to address affordability issues.

The ongoing revision of the water policy framework is a welcome development to ensure it is fit for purpose to address current and future challenges, including improved water quality and enhanced resilience to climate change. Costa Rica has made progress on water governance with the establishment of regional stakeholder forums and the ongoing work on river basin planning. The new water policy framework and implementation of river basin planning should reflect the results of extensive consultations with stakeholders and indigenous communities.

Recommendations on environmental performance

Strengthening climate mitigation and adaptation policy

- Fully implement the measures outlined in the National Decarbonisation Plan 2018-50 in all sectors in a timely fashion; use the periodic monitoring of the plan to identify barriers to implementation and good practices, and for adjusting policy actions accordingly.
- Update the GHG emission inventory more frequently; further improve the knowledge base on climate-related hazards and vulnerabilities.
- Secure and efficiently use funds for investment in improving the climate resilience of physical assets, including through effective maintenance, management and operation of infrastructure; systematically integrate vulnerability and resilience to climate change impacts into the appraisal procedures for land-use plans and infrastructure and settlement projects, public procurement process and public-private partnerships.

Decarbonising energy generation and use

- Upgrade the power grids and their operating efficiency to support expansion of the charging network for electric vehicles, as well as the integration of power generation from geothermal, onshore and offshore wind, photovoltaics, biomass and wave technology.
- Introduce stringent mandatory energy standards for new buildings and renovations (near-zero energy building standard); strengthen the minimum energy performance standards for appliances and extend their coverage to other electrical devices and equipment.
- Accelerate development of smart grids and high-resolution pricing; require electricity retailers to provide clear information to customers about their power consumption, as well as advice on energy savings; conduct regular campaigns to raise awareness about energy savings.

Improving the environmental performance of transport

- Increase public investment on public transport, cycling and pedestrian infrastructure projects; accelerate implementation of an integrated public transport system in the Greater Metropolitan Area (GAM); rationalise and improve transport governance in the GAM; to this end, consider establishing a metropolitan transport authority to co-ordinate mobility systems in the GAM.
- Ensure that local land-use plans integrate sustainable mobility concerns by promoting settlements with easy access to transport links and including a network of safe walking and cycling routes; rearrange the road layouts in cities to give more space to cyclists, pedestrians and public transport.
- Pursue the electrification of motorcycles and urban buses in addition to that of private cars; extend the pilot implementation of electric bus routes, including in municipalities outside the GAM; consider providing financial assistance to buy electric buses; continue to extend the charging points for electric vehicles across the road network.
- Strengthen pollutant emission standards for all passenger and freight road vehicles without delay; adopt fuel efficiency or CO_2 emission standards for vehicles; reinforce mandatory vehicles' technical inspections and include more air pollutants in the emissions tests; prohibit the circulation of non-compliant vehicles.

Monitoring air pollution

- Produce data on national air emissions more frequently and improve reporting; expand the ambient air monitoring network, including in regions outside the GAM.

Modernising waste services for the circular economy

- Complete development of integrated waste management plans in all municipalities; include public-private initiatives in the plans; reinforce the capacity to invest in waste treatment and provide sound waste management services, including through inter-municipality agreements supported by government policy.
- Expand extended producer responsibility schemes to major waste streams, including organic waste, packaging and construction and demolition waste; set compulsory recovery targets for all schemes and ensure their enforcement; include the use of recovered materials and recycled waste among the criteria for public procurement; introduce a ban on disposal of biodegradable waste in landfills.
- Reform waste collection fees to ensure cost recovery and encourage waste sorting at source, while addressing the impacts on poor households adversely affected by the related price rises.
- Improve the collection and dissemination of information about waste generation and treatment; strengthen reporting obligations of waste operators; establish an integrated digital platform to disseminate data on waste by type of material.

Ensuring effective water resources management

- Expand water quality monitoring, in terms of parameters covered, frequency of monitoring and coverage of water bodies; periodically and publicly report on the quality of water bodies.
- Accelerate and scale up investment in water infrastructure to expand access to drinking water and sanitation services, extend wastewater treatment, reduce water losses and ensure resilience to the impacts of climate change.
- Ensure adequate supervision of the construction, operation and maintenance of septic tanks to minimise risks of contamination.
- Progressively raise water supply and sanitation tariffs to better reflect the costs of service provision based on long-term strategic investment plans with independent oversight of the regulator; expand targeted social measures to address affordability issues.
- Review the rates of the Water Utilisation Levy to better reflect the full cost of water use by users from a given source, including the scarcity value in cases where demand exceeds supply; expand the Water Discharge Levy to cover a broader range of pollution parameters to more fully apply the polluter-pays principle.

2. Towards green and inclusive growth

Sustainable development and green growth are high on Costa Rica's political agenda, but challenges lie ahead

Costa Rica is strongly committed to meeting the SDGs. To that end, it has established a solid policy framework to support and evaluate SDG implementation and engage civil society. Its 2016 "Social Pact for the Implementation of the SDGs" is the first such pact in the world.[8] The President of the Republic chairs the High-Level Council for the SDGs to ensure policy coherence. A comprehensive system of statistical indicators is in place to monitor progress. Costa Rica's strategy prioritises SDGs related to poverty and inequality, sustainable production and consumption, and resilient infrastructure and sustainable communities; these are considered instrumental to meet all other goals. The SDGs have been guiding strategic policy making. The National Development and Public Investment Plan (PNDIP) 2023-26 is the second multiannual investment plan to link investment projects to the SDGs they contribute to achieve.

The scale of the investment needed to achieve the SDGs is extensive. Meanwhile, the government is facing severe fiscal constraints in an uncertain global context. With high public debt, maintaining fiscal prudence is critical for macroeconomic sustainability (OECD, 2023[1]). It is essential to improve the quality and efficiency of public management and spending. There is a need to further engage households and businesses in environmental protection, as well as to mobilise private finance towards a green and inclusive economy. To that end, Costa Rica should promote compliance with environmental regulations, provide stronger price signals and remove harmful subsidies, while considering the rising cost of living and supporting vulnerable groups in getting out of poverty and job informality.

The environmental governance system is well established, but implementation is lagging behind

Institutional and policy fragmentation hampers policy coherence and implementation effectiveness

Costa Rica has a long-standing environmental policy and a comprehensive legal framework. Diverse environmental programmes, laws and regulations are in place, and many more are under development. The country has shown continued commitment to aligning its legislation, policies and practices with OECD standards. However, policy objectives have not always translated into actionable measures and adequate financing (CONARE, 2022[17]).

Costa Rica has adopted a whole-of-government approach to environmental management and sustainable development. However, the institutional framework could be streamlined with a view to enhancing coherence and effectiveness of policy making and implementation. As in many countries, several ministries share responsibilities for sustainable development and environmental policies with the MINAE. In addition, the environmental governance structure comprises a multitude of subsidiary and autonomous or decentralised bodies. These have varying degrees of autonomy from government ministries and limited steering and accountability mechanisms – a common feature of Costa Rica's public administration (OECD, 2021[20]). Recognising this problem, a 2022 legislative proposal aims to consolidate MINAE and reduce the number of its subsidiary bodies. The environmental legislation establishes several inter-ministerial bodies to ensure co-ordination at the political, technical and operational levels. The country is divided by geographical demarcations for different purposes (e.g. for regional development, watershed management, integrated natural resource management), each with associated institutions for multi-level governance. All this creates an overly complex, expensive and fragmented system (CGR, 2022[21]; OECD, 2021[20]).

Stronger implementation capacity at local level is needed

The autonomy and financial resources provided to the 90 local governments (82 cantons or municipalities and 8 district municipal councils) should be strengthened so they can deliver quality environmental and mobility services to their inhabitants. As in many countries, local governments are responsible for a wide range of environment-related matters – from land-use management to waste collection. The 2001 constitutional reform has formally allocated more powers and budget to subnational governments. However, the delay in implementing the reform implies that local authorities still have limited financial and human resources, and implementation capacity (OECD, 2021[20]). Most local governments face difficulties in collecting taxes and service fees, whose revenue barely covers staff costs. Service quality and delivery vary greatly across municipalities and regions. The experience of other OECD countries shows that inter-municipal arrangements to pool or share resources help provide better services at lower costs through economies of scale (OECD, 2019[22]). However, Costa Rica's legislation does not allow municipalities to do so. The Greater Metropolitan Area (GAM) lacks a metropolitan structure to co-ordinate the management of public urban services such as public transport and waste management (Section 1).

Environmental regulation is becoming more efficient but should be further improved and better enforced

The ongoing permitting reform aims to reduce the regulatory burden on businesses

In 2022, Costa Rica launched a comprehensive reform to streamline the now cumbersome system of government approvals. Integrated environmental permits will be part of the "Single Window of Investment" (VUI), a paperless one-stop shop for permits. This aims to simplify application procedures for activities with a low level of environmental risk. Environmental inspections will also be integrated. This would align Costa Rica with the OECD standard on integrated pollution prevention and control.

In line with OECD standards, an environmental impact assessment (EIA) is required for any activity, work or project that entails risks of adverse impacts on the environment. The process, conducted by the National Environmental Technical Secretariat (SETENA), leads to the issuance of an Environmental Licence or Viability (VLA), which lays out specific environmental requirements for activities or projects. Costa Rica could further improve environmental permitting by introducing cross-media, process-oriented licences based on Best Available Techniques (BAT).[9] SETENA also issues VLAs of local land-use plans, which are the only plans to undergo a strategic environmental assessment (SEA). As in other countries, the overall effectiveness of the assessment process can be strengthened. A 2023 regulation aims to streamline the EIA and VLA issuance processes and make them more efficient.

Compliance promotion, proactive inspections and stronger enforcement are needed

Authorities' inspection plans give priority to facilities with high environmental and health risks.[10] However, in practice, most on-site inspections are reactions to complaints or incidents. Costa Rica has encouraged the participation of citizens in compliance monitoring activities, with the establishment of 40 committees of volunteer environmental inspectors. There is room to better support the regulated community in fulfilling its environmental requirements by providing technical assistance and information on best practices. This would also help reduce the compliance monitoring workload on authorities. The staff of monitoring and enforcement authorities is largely insufficient to cope with the increasing number and complexity of suspected violations. In case of non-compliance is detected, the Environmental Administrative Tribunal (TAA) can impose administrative sanctions such as fines. Fines are calculated in relation to the estimated value of environmental damage but not to the benefits of the operator from non-compliance, which would provide a stronger deterrent. Revenues from fines are channelled to a fund administered by the health ministry or to the municipality where the offence occurred rather than to the general state budget, which can entail conflicts of interest.

There is scope to improve price signals through a system of green taxes and charges and by removing harmful subsidies

Costa Rica should follow through on its plan to implement a green tax reform and carbon pricing

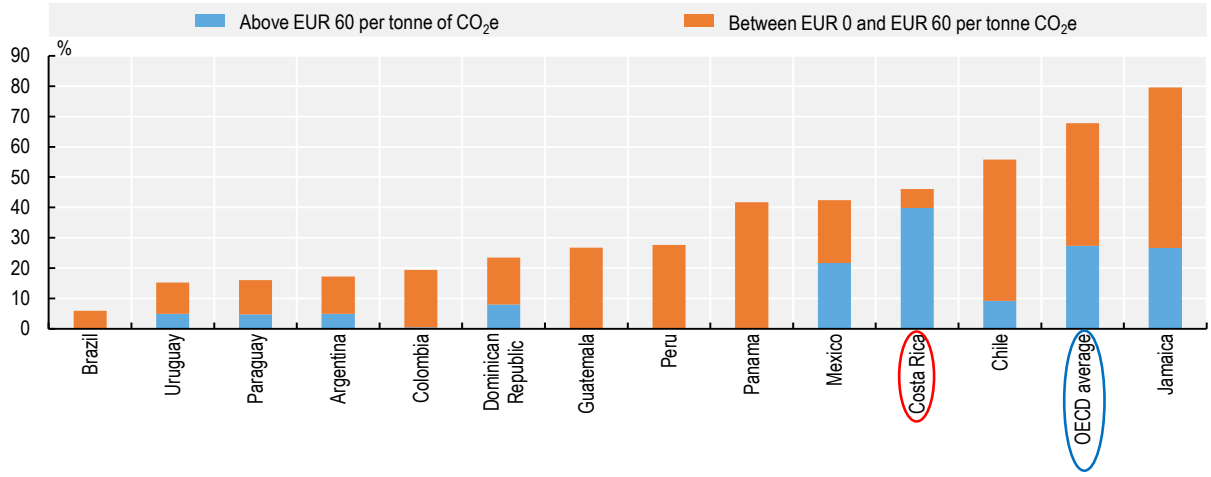
Environment-related taxes are an important source of fiscal revenue in Costa Rica, especially because of generally low revenues from income taxes and large informal employment. On average, they accounted for about 10% of total tax revenue and 2.3% of GDP in 2010-21, above the respective OECD averages (6.8% and 2.2%). Revenue increased steadily and strongly over the same period, in line with a rising number of vehicles on the roads and higher fuel consumption (except in 2020, at the peak of the COVID-19 pandemic). As in most other countries, most receipts come from the excise duty on fuels and, to a lesser extent, from vehicle taxes. Taxes on pollution and resource management mainly apply to wastewater discharges and water use (Section 1) and generate limited revenue. Proceeds from environment-related taxes are partly earmarked for environmental purposes (Section 3).

The fuel and vehicle taxes should be redesigned to encourage a shift towards cleaner vehicles, public transport and active mobility. The annual vehicle tax applies the same rate, regardless of fuel efficiency or emission levels. In addition, the tax amount decreases with vehicle age, which favours old and potentially more polluting and less safe vehicles. Electric vehicles (EVs) benefit from several tax exemptions. EV subsidies should be accompanied and progressively replaced by rising taxation of internal combustion engine vehicles (ICEVs), with a view to reducing the difference in purchase price or lifetime cost between EVs and ICEVs. Vehicle taxes should be combined with more stringent emission standards (Section 1).

As in most countries, road fuel prices and taxes do not fully reflect the social costs of fuel use, including costs associated with emissions of greenhouse gases (GHGs) and local air pollutants, accidents and congestion (Parry, Black and Vernon, 2021[23]). The excise duty on diesel is less than 60% that on petrol, despite the higher carbon content per litre of diesel and higher emissions of local pollutants from diesel vehicles. Fuel taxes are generally higher than in other LAC countries, while subsidies are lower. As a result, Costa Rica's net effective carbon rates (ECRs) are the highest among the major LAC economies. However, in 2021, the average net ECR on road transport fuels was just two-thirds the OECD average. According to OECD estimates, less than half of the country's GHG emissions are priced via the fuel tax (Figure 7). All emissions of GHGs other than CO_2 (mostly methane and nitrous oxide) are not priced at all (OECD, 2022[24]).

Figure 7. Energy taxes cover a higher, albeit insufficient, share of GHG emissions than in many LAC countries

Share of GHG emissions subject to a positive effective carbon rate (net of subsidies), selected LAC countries and OECD average, 2021.



Note: The Effective Carbon Rate (ECR) is the sum of permit prices from emissions trading systems, carbon taxes and fuel excise taxes. The Net ECR is the ECR minus fossil fuel subsidies that decrease pre-tax fossil fuel prices. The carbon benchmark of EUR 60 tCO_2e is a low-end estimate of the climate damage caused by each tonne of CO_2 emitted in 2030 and the carbon prices that would be needed by then for consistency with net-zero emissions targets. It is also a mid-range benchmark of current carbon costs.
Source: OECD (2022), Pricing Greenhouse Gas Emissions: Turning Climate Targets into Climate Action, *OECD Series on Carbon Pricing and Energy Taxation*, OECD Publishing, Paris.

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The National Decarbonisation Plan (PND) 2018-50 mandates the Ministry of Finance, in collaboration with MINAE, to design a green tax reform, including the introduction of carbon pricing and the removal of fossil fuel subsidies. The intention is welcome. It should be followed through to align price signals with the country's ambitious climate goals (Section 1). The reform also aims to find alternative sources of tax

proceeds to offset the revenue loss from vehicle and fuel taxes, which will likely result from the progressive electrification of the vehicle fleet and the shift to public transport and active mobility. To this end, the tax package should include well-designed vehicle taxes and, in the medium term, distance-based road charges. As a first step, the government should raise road tolls, which have not been updated since 2002. Implementing congestion charges would help curb peak-time congestion in critical areas of the GAM in a cost-effective and socially fair manner. There is also room to introduce taxes on resource use and pollution. These taxes could target chemical fertilisers and pesticides, which are intensively used (Section 3), as well as landfilled waste and selected plastic products (e.g. bags), with a view to improving waste management and reduce plastic pollution (Section 1).

The green tax reform should also aim to reduce tax avoidance and make the tax mix more progressive and conducive to creating jobs and moving towards a more formal economy. Gradually introducing a comprehensive package of tax measures will help smooth the costs of the reform across sectors and over time. Well-targeted and transparent policies for using additional revenues from environment-related taxes and subsidy removal are key to improve social acceptability of reforms, especially at times of high cost of living.

Many fiscal incentives have a negative impact on the environment

In 2021, the Ministry of Finance categorised tax exemptions and discounts according to their environmental impact. It estimated that revenue losses due to environmentally harmful tax incentives amounted to 0.24% of GDP in 2020, including tax discounts and exemptions on fossil fuel use and agricultural inputs (Section 3). Tax expenditures with positive environmental impact were negligible (Ministerio de Hacienda, 2021[25]). Costa Rica should build on this exercise to develop a plan to phase out environmentally harmful subsidies, including support to energy use and agriculture (Section 3). Fossil fuel support amounted to about 0.13% of GDP in 2021 (OECD, 2023[26]). Support is nearly exclusively linked to the use of petroleum products. It increased in the last decade, mainly due to the introduction of a price discount on liquefied petroleum gas (LPG) in 2016. Exemptions from the fuel excise duty for fuels used in commercial aviation and fishery is the main form of support, followed by the LPG price discount.

The government response to the 2022 hike in global energy prices will likely lead to increasing amounts of fossil fuel support. That year, the government more than halved the tax rate on LPG for six years. This measure targeted low-income households, who are the main users of LPG for cooking and heating, as well as the pandemic-stricken service sectors. Temporary measures moderately reduced the price of petrol and diesel, which is mostly used in freight, agriculture and shipping. Overall, these measures were less costly and less regressive than in regional peers (Garcimartín and Roca, 2022[27]). Nonetheless, increasing the temporary allowance for poorer households (*Bono inflación*) is a preferable way to shield the population most affected by rising prices as it does not discourage energy savings (OECD, 2023[1]).

The transition to a green and decarbonised economy requires large-scale investment

Public environment-related investment should be increased and made more efficient

Public spending on environmental protection averaged 1.2% of general government expenditure in 2012-19.[11] Waste management accounted for more than half of public environmental expenditure, followed by biodiversity with about one quarter. All waste related spending occurs at local level. Current expenditure (i.e. for covering operating costs) makes up the bulk of spending in environmental protection, neglecting much-needed investment in waste and wastewater infrastructure. Similarly, investment in transport infrastructure has been insufficient and mostly focused on roads.

There is a need to reallocate resources to address infrastructure gaps, improve service delivery and implement the PND 2018-50 (Section 1). Financial needs for implementing the PND are estimated at USD 5 billion for 2021-25 (7% of GDP), mostly for investment in electric and public transport and waste

management. However, the PNDIP 2023-26 continues to focus infrastructure investment on roads. Accelerating the PND investments would boost economic recovery and employment (Groves et al., 2022[28]). At longer term, achieving a decarbonised and digital economy could create 135 000 net jobs by 2050 (equivalent to 5% of the 2021 labour force), mainly related to clean energy, sustainable transport and efficient use of natural resources (Quirós-Tortós et al., 2022[29]).

Further improving capacity to execute capital investment projects will require stronger accountability mechanisms, transparency and impact evaluation. Costa Rica's well-developed National Public Investment System (SNIP) aims to improve and harmonise project selection across the public sector. However, only part of the public investment by autonomous institutions is reported to the SNIP (OECD, 2021[20]). On average, only 30% of the budgeted capital spending is used (OECD, 2023[1]). The government issued regulations and guidelines to integrate climate mitigation and adaptation considerations into the SNIP and started implementing a taxonomy of sustainable infrastructure. Costa Rica has defined standards for using cost-benefit analysis but in practice has made little progress in using them to select projects (OECD, 2020[30]). Implementing green budgeting practices would help the government align public expenditure, as well as revenue, with climate and other environmental goals.

There is a clear need to explore new financing avenues

Given the limited fiscal space, more private participation in infrastructure projects is needed. Concessions and public-private partnerships (PPP) can help in this respect. Costa Rica's PPP legal framework is aligned with OECD standards, but inefficiencies and long execution delays remain (OECD, 2021[20]). Thorough assessment of projects, adequate specifications of the contracts and proper fiscal accounting are crucial to maximise value for money of PPPs and limit risks for public finances.

Costa Rica's long-standing environmental commitments place the country in a favourable position to access international green finance, including through green, social, sustainability and sustainability-linked (GSSS) bonds. Costa Rica is among the ten largest LAC issuers of GSSS bonds on international markets. The experience of Colombia shows that sovereign green bonds in local currency could help mobilise finance from private and institutional investors in the domestic market (OECD et al., 2022[31]). Work is ongoing to develop official government guidance to access finance from the Green Climate Fund. The General Superintendence of Financial Institutions developed a methodology to assess climate-related financial risks of the country's banks and financial institutions. A systematic application of this assessment methodology would enhance transparency, provide incentives for redirecting finance towards cleaner activities and prepare for the introduction of climate-related financial disclosure requirements. Costa Rica would benefit from joining the efforts of other LAC countries in further developing and harmonising a GSSS bond standards, corporate sustainability standards and taxonomies to identify activities and investment that contribute effectively to the green transition.

More effective incentives are needed to encourage businesses' environmental investment

Costa Rica has several measures to encourage businesses to engage in environment-friendly activities and investment, in line with its 2018 National Policy for Sustainable Production and Consumption. These include fiscal incentives for investment in environment-friendly equipment and processes and a programme of voluntary agreements led by MINAE. A variety of business certification programmes and labels is available. According to a survey by the Central Bank of Costa Rica, 65% of companies had some form of environmental certification in 2018-20, mostly under the Country Programme for Carbon Neutrality and the Ecological Blue Flag Programme. The Certification for Sustainable Tourism has helped position Costa Rica as a pioneer of ecological tourism (OECD, 2023[32]). However, this multitude of certifications and labels risks creating confusion for customers and generating "greenwashing". Businesses spend little in environmental activities. In 2018-20, the share of environmental protection expenditure in total business

expenditure was less than 1% (BCCR, 2022[33]). Most spending went to managing waste and reducing air emissions.

With large spending on public procurement (12.5% of GDP in 2018), expanding green public procurement (GPP) can greatly help raise demand for cleaner products and services, thereby stimulating entrepreneurship, innovation and job creation in green industries. For instance, GPP can foster the creation of markets for recovered and recycled materials (Section 1). In 2015, Costa Rica was the first LAC country to adopt a National Policy for Sustainable Public Procurement, followed by technical regulations setting environmental criteria for public purchases of several items and services. However, results have been modest, largely because the overall public procurement system is still fragmented and inefficient (OECD, 2020[34]). The new law establishing that all public institutions must carry their purchases through the central procurement system is a welcome step.

Costa Rica has consolidated its framework for environmental democracy

Provision of environmental information has greatly improved, but gaps remain

Costa Rica has made remarkable progress in implementing the open government principles of transparency, accountability and participation. Its legal and institutional frameworks for open government are on par with OECD standards. The National Environmental Information System (SINIA) was established in 2013 to co-ordinate the collection of environmental statistics and disseminate them through a single web repository. The National System of Climate Change Metrics (SINAMECC), established in 2018, is a parallel platform for information related to climate change. Work is progressing to implement statistical environmental accounts and a pollution release and transfer registry, as well as to update the state of the environment report (the first and last was released in 2017). However, more work is needed to extend the coverage of SINIA, as much information is still scattered across ministries, their subsidiary entities and other autonomous bodies. Information gaps persist, including on GHG emissions, air and water quality, and waste (Section 1), as well as the oceans (Section 3). These gaps impede evidence-based decision making and informed citizen engagement.

Public participation features in many environmental decision-making processes

Public participation and consultation of indigenous communities are required by law for the formulation of several public policies and environmental decision-making processes. These include EIA procedures and, to a lesser extent, SEA. Several mechanisms for public participation are in place. In 2018, the government introduced the General Mechanism for Consultation of Indigenous Peoples. The population shows a high degree of satisfaction (67%) with the country's efforts in protecting the environment. Citizens' support for environmental policies has remained above 50% since 2010 (Gallup, 2022[35]). However, active engagement of citizens and civil society organisations remains limited, and trust in government is relatively low (OECD, 2023[1]; OECD, 2021[20]). Education and awareness-raising policies can help accelerate cultural change.

Citizens are granted access to justice in environmental matters

Every person has legal standing to denounce any acts that may violate the constitutional right to a healthy and ecologically balanced environment and to safe drinking water. Every citizen can file a complaint for suspected non-compliance with environmental provisions and claim compensation for the resulting damage. A centralised system for collecting and following up on environmental complaints, operated by the Environmental Comptroller, is accessible to all citizens. Complaints have increased steadily since 2017. In 2021, almost half of them concerned forests (mostly about illegal logging), followed by complaints related to biodiversity loss and water pollution.

In line with its environmental democracy tradition, Costa Rica was among the promoters of the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement), which entered into force in April 2021. Costa Rica has taken several measures to protect environmental human right defenders and Indigenous Peoples but has not ratified the agreement. Ratifying the Escazú Agreement would further improve the country's advanced legal framework to manage the environment and guarantee environmental democracy (OECD, 2023[32]).

Recommendations on green and inclusive growth

Improving environmental and sustainable development governance

- Build on the legislative proposal on strengthening the environment ministry's competencies to develop a plan for rationalising the environmental governance system, based on transparent criteria for maintaining or establishing institutional entities; simplify and streamline the councils and committees for horizontal co-ordination and multi-level governance for sustainable development.
- Provide guidance, support and training to central and local government bodies to improve their capacity to develop science- and evidence-based policies and carry out their environment-related responsibilities.
- Allow and encourage inter-municipal arrangements to build the necessary economies of scale to deliver environment-related services in a more cost-effective manner.

Ensuring compliance with environmental requirements

- Swiftly implement integrated environmental permitting and inspections; make Best Available Techniques the basis for setting conditions in environmental permits for high-risk installations.
- Extend the strategic environmental assessment (SEA) requirement to sectoral plans and programmes, giving priority to public investment plans, and build related institutional capacity; broaden public participation mechanisms for SEA procedures.
- Implement risk-based planning for environmental inspections to improve efficiency of compliance monitoring and reduce its reliance on environmental complaints; conduct systematic inspections to ensure compliance of activities with requirements set in the Environmental Licence or Viability.
- Impose fines that reflect the gravity of the offence and recover the economic benefits to the operator from non-compliance, with a view to increasing the deterrent effect of monetary penalties; allocate revenues from fines to the state budget.

Greening taxes and subsidies

- Accelerate the development and implementation of a comprehensive green tax reform, as foreseen by the National Decarbonisation Plan 2018-50. As part of the reform:
  - introduce a carbon tax component in the fuel excise levy; set the rate at an initially low level and gradually raise it over time according to a pre-defined schedule
  - progressively raise the fuel tax rate on diesel to at least match that on petrol
  - increase taxes on conventional vehicles and modulate them according to the vehicles' weight, fuel efficiency and levels of local pollutant emissions; reduce the annual depreciation rate of the vehicle's fiscal value to eliminate the distortion in favour of old vehicles

  - update road tolls and differentiate them according to vehicles' emission parameters; lay the groundwork for a fully-fledged system of distance- and time-based road charges
  - consider introducing congestion charges, potentially in combination with low-emission zones, to address congestion and air pollution in critical areas of the Greater Metropolitan Area, as well as to raise revenue to finance investment in sustainable transport infrastructure and services
  - introduce taxes on pollution and resource use, such as on chemical fertilisers and pesticides, landfilled waste and selected plastic products
  - use part of the revenue from increased environment-related taxes to mitigate their impact on low-income households and most affected economic sectors, as well as to finance policies and investment for the green transition; periodically review revenue earmarking arrangements in a transparent way
- Develop the regular stocktaking of tax expenditure into a systematic screening of actual and proposed subsidies with a view to identifying those not justified on economic, social and environmental grounds; prepare a plan to phase out fossil fuel and other environmentally harmful subsidies.

Investing in the green transition

- Scale up and accelerate environment- and climate-related investment; increase private participation in infrastructure projects through transparent and fiscally sound concessions and PPPs; ensure timely execution and quality of infrastructure projects.
- Systematically apply cost-benefit and climate risk analysis to capital investment projects, as required by regulations; include shadow costs of GHG emissions and other environmental impact in public investment appraisal; regularly evaluate that executed spending contributes effectively to improving environmental outcomes and resilience.
- Extend the use of green bonds to finance investment in decarbonisation and biodiversity; consider issuing sovereign green bonds for the domestic market; promptly finalise the official guidance to access finance from the Green Climate Fund.
- Strictly enforce environmental criteria in public procurement and monitor implementation; expand the categories of products and services covered by sustainable public procurement.

Promoting environmental democracy and citizen engagement

- Improve production, collection and dissemination of environmental statistics as part of the SINIA, including through increased funding, deployment of Earth observation technologies and enhanced collaboration with the scientific community; strengthen the capacity of decentralised institutions and local governments of collecting and processing environment-related information.
- Consider the possibility of taking steps towards ratifying the Escazú Agreement.

3. Biodiversity conservation and sustainable use

Costa Rica has reversed deforestation, but pressures on its rich biodiversity remain strong

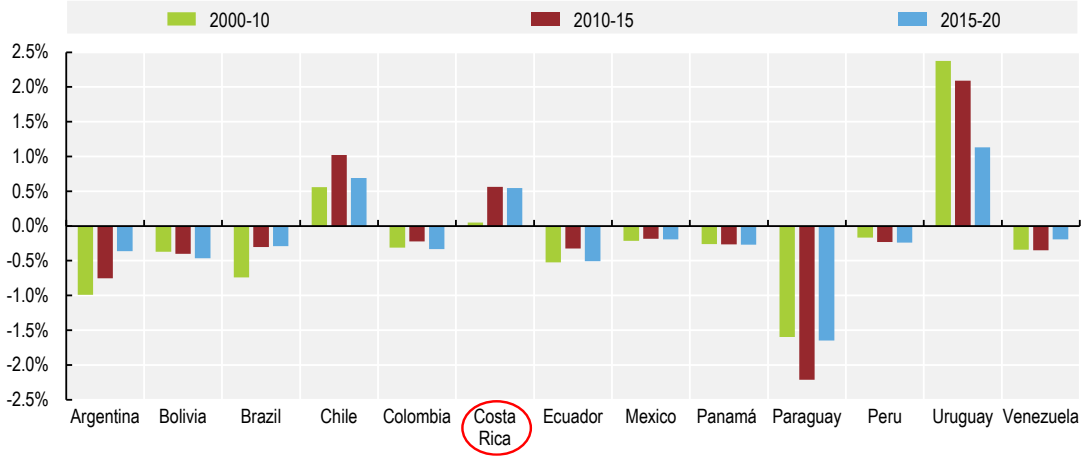
A megadiverse country, Costa Rica is home to about 6% of the world's known species and hosts a large variety of ecosystems. Its biodiversity supports the country's florid nature-based tourism, productive agriculture and artisanal fisheries. Costa Rica's natural capital is estimated at no less than USD 15 billion

per year, or 23% of the 2019 gross domestic product (GDP). Much of this value arises from ecosystem services such as climate regulation, erosion prevention, food and water provision, and nature-based tourism (Hernández-Blanco and Costanza, 2021[36]). Infrastructure development, urbanisation, tourism, farming, fishing, untreated wastewater, pollution and climate change exert pressure on Costa Rica's biodiversity. The conservation status varies across regions and ecosystems.

Costa Rica has managed to increase secondary forest cover (Figure 8), thanks to a mix of targeted policies (see below), as well as external factors such as the collapse of the beef market in the 1980s (Ardila et al., 2020[37]). Today, forests cover 59% of the country's land areas, up from an all-time-low of 21% in 1987, but still far from 75% in 1940. About half of the forested area is under some form of protection, either within official protected areas or in biological corridors. However, reforestation and regeneration rates vary across types of forests and regions, with substantial forest fragmentation. Dry forests have recovered well, while humid and cloud forests show low to moderate deterioration levels (MINAE et al., 2018[38]). Secondary forests on abandoned agricultural lands are ecologically different from the original forest of a site. Land conversion from forests to pastures, crops and urban areas has grown since the mid-2010s (CONARE, 2021[9]). Wildfires and climate change are affecting forests, some of which have stored carbon that might be released (Section 1).

Figure 8. Costa Rica is among the few Latin American countries to have increased forest cover

Average annual percentage change in forest area in selected Latin American countries.



Source: FAO (2020), Global Forest Resource Assessment 2020, www.fao.org/forest-resources-assessment/en/.

StatLink https://stat.link/jywhe4

While coastal areas are sparsely populated, they are under rising pressure from intensive fishing practices, massive tourist flows and uncontrolled development of tourism-related infrastructures and buildings (Moreno Díaz et al., 2019[39]), as well as runoffs, sediments, waste and untreated sewage produced in the Central Valley (where most people live). These are also the main drivers of deterioration of mangroves and other wetlands (MINAE et al., 2018[38]). About 7% of Costa Rica's known species are threatened, which is relatively low compared to other megadiverse countries. However, the number of threatened species has been increasing since the late 1990s. Knowledge about the health of marine ecosystems and species is limited, but there is evidence of unsustainable exploitation of marine resources.

The revision of the National Biodiversity Strategy is an opportunity to enhance policy coherence

Costa Rica's environmental policy took a decisive turn in the 1990s, in a bid to halt deforestation, recover lost forests and promote economic activities based on the sustainable use of biodiversity. The Biodiversity Law, the Forest Law and the Wildlife Conservation Law established the institutional and policy settings for biodiversity management that are still largely in place today. They introduced a ban on mature forest clearing and the nationwide Programme of Payments for Environmental Services (PPSA), as well as a multi-level governance system for managing the network of protected wilderness areas (ASPs) and natural resources (forest, wildlife and water) in an integrated fashion. As in other sectors of Costa Rica's public administration, several institutions at central and subnational levels share biodiversity management, which often creates conflicting objectives and overlapping responsibilities (Section 2).

Costa Rica has an array of strategies and programmes in place, broadly in line with the country's international commitments. The National Biodiversity Management Commission (CONAGEBIO) oversees the implementation and monitoring of the National Biodiversity Policy 2015-30 and the National Biodiversity Strategy 2016-25 and Action Plan (ENB2) – the main documents guiding the country's biodiversity policy. They also aim to foster social inclusion and citizen participation. The ENB2 is itself the result of a broad participatory process that included Indigenous Peoples in an effective manner for the first time.

The ENB2 adopts a result-based approach by setting 100 targets, identifying the administrations responsible for achievement of each target and establishing an interinstitutional committee to monitor progress. Most ENB2 targets have been achieved or are on track to be achieved, including those for protected areas management, connectivity, forest cover and area under the PPSA. However, progress on some key targets has been slower, namely those related to enforcement of environmental legislation and spatial planning, recovery of mangrove ecosystems and coral reefs, illegal extraction and trade of species, pesticide use, knowledge of marine biodiversity and environmental education (MINAE, CONAGEBIO and SINAC, 2023[40]).

The planned revision of the ENB2 aims to align the strategy with the targets of the Kunming-Montreal Global Biodiversity Framework (GBF) for 2030. It provides the opportunity to address the barriers to achieving biodiversity-related targets in a cost-effective way. The updated strategy should bring the multitude of biodiversity-related programmes and policy measures into a coherent framework and identify concrete actions to mainstream biodiversity considerations in agriculture, fisheries, tourism and urban development policies. It should also consider how to reduce institutional fragmentation, which hinders implementation and risks increasing the costs of achieving targets. Increasing cost effectiveness is even more crucial given the fiscal constraints Costa Rica is likely to face for the years to come. Further improving knowledge and data, particularly on marine and freshwater ecosystems, is essential to build consensus around biodiversity policy, identify priorities for action and manage natural resources effectively.

Protected areas have helped reduce biodiversity loss, but their ecological representativeness and management could be improved

Costa Rica expanded its network of protected area and biological corridors

Costa Rica's extensive ASP system has been effective in controlling human pressures such as hunting, logging, extraction of flora and fauna, and agriculture. It also plays an important climate mitigation role, as forests in large national parks are among the major carbon sinks (CONARE, 2022[17]). As of 2022, there were 151 ASPs. A quarter of terrestrial area is included in the ASPs, above the 2020 Aichi Target (17% of land area). A wide marine ASP was established in 2021, bringing the share of marine protected areas up from less than 3% of the exclusive economic zone (EEZ) to 30%. This is the second highest share among countries in LAC, after Chile. Costa Rica is not far from achieving GBF Target 3 (30% of land and sea

under protected areas and other area-based effective conservation measures or OECMs). However, it will need to accelerate the pace of progress for terrestrial areas compared to the last decade, as well as the identification of OECMs and the establishment of a national framework for the implementation of these measures.

To achieve Target 3, more efforts will also be needed to improve the ecological representativeness of protected areas. The ASPs cover 44.5% of the key biodiversity areas and 16% of the ecologically or biologically significant marine areas (EBSAs) present in Costa Rica (CBD and UNDP, 2021[41]). Forest ecosystems and the EBSAs off the Caribbean coast are generally better represented than rivers and coastal and mangroves areas on the northern Pacific and central Caribbean coasts. The ASPs cover less than 2% of the biodiversity-reach Costa Rica Thermal Dome in the country's northern Pacific EEZ.

Costa Rica has placed great emphasis on connectivity between ecosystems and participation of non-governmental stakeholders and local communities in natural resource management. It has also traditionally encouraged land donations and the creation of protected areas on private land through tax incentives. A network of 51 biological corridors, including six interurban biological corridors in the Greater Metropolitan Area (GAM), is in place to reduce fragmentation between ecosystems within and outside protected areas. They cover 38% of the land area. As of 2022, the Costa Rican Network of Natural Reserves, which includes fully private natural reserves outside the official ASP system, covered about 2% of national territory. In some cases, these reserves are located in biological corridors and act as buffer zones between larger state-owned protected areas. Non-governmental organisations (NGOs) own and manage some private reserves, as well as being actively engaged in the management of biological corridors.

Little progress has been made in identifying the areas for biodiversity conservation and sustainable use that will be managed by Indigenous Peoples (*Áreas de Cuido*) – one of the ENB2 targets. Forests cover 70% of the area within the 24 indigenous territories' (CONAGEBIO, 2023[42]), with overlaps between the indigenous territories and the official ASPs (FAO and FILAC, 2021[43]). The restrictions to resource use and ancestral activities in the ASPs have been a source of conflict. There are positive examples of public-private co-operation to support indigenous-led businesses in their territories. However, the staff devoted to engaging and empowering Indigenous Peoples is limited.

There is scope to improve the management of protected areas and biological corridors

Management of protected areas has improved since the mid-2010s. As of 2020, 70% of protected areas had a management plan, but only half had management effectiveness evaluations. The quality and the details of management plans differ substantially across ASPs. In addition, several biological corridors do not have their local multi-stakeholder managing committee and management plan in place. These are essential for ensuring the participatory organisation that is at the core of the biological corridor concept.

Costa Rica should make sure the ASPs are properly funded and staffed. The National System of Conservation Areas (SINAC), a subsidiary body of the environment ministry (MINAE), oversees the ASP network. It is tasked with the integrated management of natural resources (forest, wildlife and water) within and outside protected areas. Between 2015 and 2020, the SINAC budget increased by about 5% per year (Molina-Escalante, 2021[44]). However, the SINAC suffered a heavy cut in 2021 as part of the government's fiscal consolidation efforts. Due to understaffing, many activities on the ground within and outside ASPs take place thanks to the co-operation of civil society and NGOs.

Tourism generates revenue for protected areas and employment for local communities but also puts pressure on fragile natural areas

Costa Rica's long coastlines and rich biodiversity are the main tourist attraction. The ASP system has been a driver of the country's success as tourist destination, generating income and jobs. In 2017-19, 65% of travellers to Costa Rica visited the country to engage in nature-based activities. In 2011-19, the number of

visitors to the ASPs increased by 50% to about 2 270 000. The ASPs are estimated to contribute USD 1.8 billion per year to the national economy, or 3% of GDP, more than three-quarters of which is related to tourism (Moreno Díaz and Villalobos Salas, 2019[45]). This is more than three times the biodiversity-related public budget, which indicates the high economic returns from biodiversity-related spending.

Costa Rica tourism policy has long recognised the key role of healthy ecosystems and species for the competitiveness of tourism, as well as the potential negative impact of the sector on biodiversity. The country has branded itself as an ecotourism destination, including through voluntary certification and labelling schemes. The Global Sustainable Tourism Council recognised the Certification for Sustainable Tourism (CST) as compliant with its criteria. Costa Rica could consider assigning the audit for the CST and Ecological Blue Flag for beaches to accredited bodies, as required for the "Essential Costa Rica" country brand. This would help further consolidate the labels' credibility.

Tourism generates finance for biodiversity through ASP entrance fees, which are a major source of revenue for SINAC. However, massive tourist flows concentrated in a few months and areas put pressure on ecosystems and species, within and outside the ASPs. Entrance fees are relatively low, have not been adjusted to inflation for years and do not cover operating costs. As in many emerging economies, entrance fees are much higher for foreign tourists. This price discrimination effectively subsidises wealthier Costa Ricans, who may be willing to pay as much as foreign tourists to enjoy their country's nature. Costa Rica could also consider introducing other tourism-related fees such as diving or climbing fees, as well as fees on tourism companies to recognise the benefits they receive from a preserved nature. These would provide additional revenue.

The use of concessions for tourism-related services in the ASPs, such as restaurants, shops and parking, should be extended and made more efficient. These concessions allow the ASPs to earn revenue and improve the quality of services, while generating jobs for neighbouring communities. As of 2020, there were only two active concessions (CGR, 2020[46]). In 2021, MINAE and SINAC, with the technical support of the Biodiversity Finance Initiative of the United Nations Development Programme (UNDP-BIOFIN), released technical guidelines for management of concessions in the ASPs.

There is an urgent need to complete spatial planning and mainstream biodiversity in it

The lack of land-use planning has been a major indirect driver of biodiversity loss in Costa Rica, and it weakens the country's capacity to respond to natural hazards. As of July 2021, less than half of the country's 82 municipalities had cantonal regulatory plans (PRCs). Most plans are more than 20 years old, cover only a part of the municipal territory and have not been granted an Environmental Viability (VLA) (Section 2). Uncontrolled land conversion continues outside the ASPs, including in biological corridors, where spatial management is regulated through the PRCs (CONARE, 2022[17]). When in place, the PRCs do not impose specific land-use restrictions in biological corridors. The ENB2 acknowledges the need of better integrating biodiversity into spatial planning. Some initiatives have been taken in this direction, such as the San José "Biodiver_City" Project and the National Urban Environment Agenda, but it is too early to appreciate their results.

The absence of land-use and marine spatial plans exacerbates pressures on coastal areas, where much of the new infrastructure and building development linked to tourism occurs (CONARE, 2021[9]). Many maritime terrestrial zones (ZMTs) have experienced illegal building development. This further strains the already insufficient waste and wastewater infrastructure, thereby threatening marine-coastal ecosystems. The Costa Rica Tourism Board (ITC), which is the competent authority for the ZMTs, has provided guidance to municipalities for developing integrated ZMT management plans. However, a fragmented regulatory framework, weak inter-instructional co-operation, little participation of local communities and strong interest groups have impeded the effective development and use of these plans (Moreno Díaz

et al., 2019[39]). In response to these challenges, in 2022, the government established an interinstitutional technical group for the revisions and approval of cantonal and coastal regulatory plans.

Costa Rica pioneering programme of payment for ecosystem services should be extended and reinforced

The long-standing national PPSA has largely contributed to restoring degraded forestlands and, to a lesser extent, preventing forest clearing (CONARE, 2022[17]). The National Forestry Financing Fund (FONAFIFO), under the aegis of MINAE, manages the PPSA and finances afforestation and reforestation activities. The programme pays landowners that commit to forest conservation, reforestation, regeneration of pastures, sustainable forest management or agroforestry on their lands, thereby contributing to providing ecosystem services.[12] Of the 1.3 million hectares covered by the PPSA since its inception in 1997, more than 560 000 hectares were added between 2011 and 2021, mostly under forest conservation contracts. In 24 years, the programme paid more than USD 600 million to small and medium producers and led to the creation of 3 500-4 000 direct jobs each year (ILO, UNEP and IUCN, 2022[47]). The PPSA provides more favourable conditions to farms led by Indigenous Peoples or women. This is in line with the Gender Action Plan of the REDD+ strategy, which aims to strengthen the role of women in biodiversity conservation and close the employment and income gaps in the forestry sector.

FONAFIFO has been active in mobilising finance for the PPSA, through private donations, international co-operation, and carbon credits produced through forest plantations and REDD+. However, the PPSA funding remains highly dependent on fuel tax revenue, which is expected to decline with the progressive decarbonisation of transport (Section 2). A 3.5% share of annual fuel tax receipts is ring-fenced for the programme and accounts for nearly 90% of its funds. Between 2015 and 2021, the area under the PPSA declined, partly due to decreasing fiscal transfers to FONAFIFO. This corresponded to a decline in reforested area per year (CONARE, 2022[17]). Since 2016, FONAFIFO has consistently received less than the amount due based on fuel tax revenue. In 2020, it suffered an additional cut due to the pandemic-related drop in fuel use and associated tax revenue. This shows vividly the impact that transport decarbonisation will have on the PPSA funding and area coverage, as well as on the capacity to monitor landowners' compliance with the programme requirements.

Costa Rica should promptly approve the legislative proposal on reinforcing the PPSA that was submitted to Parliament in April 2022. The bill would help establish a coherent framework for extending the PPSA to other ecosystems, in recognition of the valuable services they provide. There is scope to broaden the set of financing instruments for the conservation and restoration of all ecosystem services, as well as to introduce a biodiversity offset system. This would contribute to ensuring a fair allocation of resources across ecosystem services and to promoting the long-term financial sustainability of the programme.

There is a need for scaling up finance for biodiversity and better spending it

Expenditures that protect biodiversity and landscape as their primary objective are a relatively large share of public environmental spending (25% in 2012-19), reflecting the country's policy priorities.[13] However, they represented just 0.1% of GDP and declined (in real terms) in the same period. Biodiversity-related expenditures, including spending with biodiversity conservation as a co-benefit or secondary purpose, are much higher. They are estimated at 0.6-0.8% of GDP per year in 2015-20. However, a large part of the biodiversity-related budget was not spent in the same period (Molina-Escalante, 2021[44]). There is a need to reinforce the capacity of institutions to manage their budget effectively and carry out their functions.

Public budget allocations do not seem commensurate with the objectives Costa Rica set for itself. Investments represent a negligible part of total public expenditure in biodiversity. Human resources for biodiversity management are insufficient, resulting in inadequate planning, management and compliance monitoring. The objectives of the ENB2 have been mainstreamed in the National Plan for Development

and Public Investment 2023-26. However, the funding gap is estimated at USD 90 million per year (0.18% of GDP) for 10-15 years.

There is a need to mobilise new sources of finance. Financing for biodiversity comes from a variety of fiscal sources. Part of the revenue from fuel taxes, water-related charges and stamp duties is earmarked for the institutions with environment-related responsibilities. Except for fuel taxes, revenue is negligible. A green tax reform could help raise revenue to finance biodiversity management, among other purposes (Section 2). Priority should be given to removing subsidies harmful to biodiversity, including for agriculture and fishing (see below), in line with the GBF (Target 18). The fiscal savings from subsidy removal could be partly redirected to finance biodiversity policy.

There is much scope to engage the business sector in private-public initiatives, including through more use of concession contracts for services in protected areas. Businesses spend very little in biodiversity conservation (BCCR, 2022[33]). Costa Rica has some experience with conservation trust funds (such as the Sustainable Biodiversity Fund managed by the National Bank of Costa Rica) and debt-for-nature swap. Green bonds could also be used to attract finance for investment in biodiversity conservation, waste and wastewater infrastructure and NbS for adaptation to climate change (Section 1). At the time of writing, the government was working, with the support of UNDP-BIOFIN, to issue a green bond for securing funds for infrastructure investment in protected areas.

REDD+ actions have vast fund-raising potential. In 2022, Costa Rica became the first LAC country to receive payments from the Carbon Fund of the Forest Carbon Partnership Facility for reducing GHG emissions in 2018-19. Costa Rica is on track to unlock up to USD 60 million for cutting up to 12 megatonnes of carbon dioxide emissions by 2025 through actions in the forest sector (World Bank, 2022[48]). The PPSA and protected areas are key tools for implementing the national REDD+ strategy and reaching net zero by 2050 (Section 1). In 2022, Costa Rica presented its National Strategy for Blue Carbon to seize the finance opportunities provided by carbon credits from conserving and restoring coastal ecosystems such as mangroves.

The equitable use of genetic and biochemical resources can be a driver of innovation and business opportunities

Costa Rica has put in place a coherent system for regulating access to its genetic resources and ensuring a fair sharing of benefits arising from their use (ABS). Since 2016, CONAGEBIO has granted the permit for using genetic and biochemical resources to seven companies, which have concluded contracts with local producers to share the benefits of the commercialisation of the products using such resources. In 2018, Costa Rica launched the "*Distintivo ABS*", a label certifying that a product using the country's genetic resources complies with the ABS regulations and good practices. This is a first for Latin America. Since 2021, six products have obtained the ABS certification.

The National Bioeconomy Strategy 2020-30 promotes equitable use of genetic and biochemical resources as a driver of innovation and business opportunities. However, an agreement on access to, and use of, genetic resources in indigenous territories and on the preservation of indigenous practices and knowledge, is still pending. This has impeded the ratification of the Nagoya Protocol on ABS, which entered into force in 2014.

Removing harmful subsidies is key to encourage good agricultural practices

Costa Rica has a large and productive agriculture sector. However, some monocultures and use of agrochemicals have exerted pressures on the environment, including clearing of forestland, soil degradation and water pollution (Roosendaal et al., 2021[49]). Agricultural support for producers has declined since 2000 and is relatively limited. It includes support to advisory services and innovation, with significant emphasis on environmental protection. In a welcome move, the government reduced

market-price support to rice (OECD, 2023[1]). Prior to this, in 2019-21, 89% of support was based on market-price support (through border tariffs and minimum reference prices).[14] Being linked to production, this form of support can increase pressures on natural resources (OECD, 2022[50]). In addition, sales of agricultural inputs, such as fertilisers and pesticides, have long benefited from tax exemptions (Section 2), which has encouraged their use. Costa Rica has among the highest intensity of pesticide use in the OECD and LAC. Many of these pesticides are highly hazardous and have not been assessed for environmental risk since their first registration in Costa Rica. In many cases, this dates back several years (Vargas Castro, 2021[51]). A new regulation on the environmental risk assessment and approval of pesticides entered into force in early 2023.

The government has put a strong focus on promoting environmentally sustainable and low-carbon farming, most recently through the National Bioeconomy Strategy 2020-30 and the Sustainable Landscape Initiative 2022-30. The government and private sector have developed several initiatives such as guidance, training and capacity building for producers, as well as a voluntary certification programme, to promote adoption of environment-friendly agricultural practices. The NAMAs for coffee and livestock production, launched in the mid-2010s, identify technologies and practices that minimise the impacts on biodiversity and water, in addition to reducing GHG emissions. Additional NAMAs for large production sectors (sugarcane, rice and bananas) are in a pilot phase. Costa Rica has been an early mover in the field of organic production, but organic farming remains marginal. Less than 1% of total agricultural area was under organic farming in 2020, compared to the OECD average of 4.8% (FAO, 2023[52]). Costa Rica should further encourage the uptake of organic farming practices by providing technical assistance to small-scale producers and helping them access international markets.

Sustainable fishery management calls for better knowledge and fewer harmful incentives

Fishing has high social value and is a major source of income for artisanal fishers in the rural and isolated communities in coastal areas. Overexploitation of coastal fisheries has affected the livelihood of artisanal fishers. Since 2008, the organisations of small-scall fishers can create Marine Areas of Responsible Fishing and participate in the zoning, management and vigilance of the areas, as well as monitoring and conservation of fish stocks. Costa Rica adopts regulatory tools to manage fish stocks but not total allowable catch limits. However, the biological sustainability of fish stocks, which is the basis for the sustainable management of fisheries, has not been recently assessed. High-capacity fishing gear with low selectivity, lost or abandoned gear at sea and harvesting during reproductive seasons are a threat to several marine species and habitats (MINAE et al., 2018[38]). The government adopted a regulation for reducing mortality of dolphins in tuna fishing and launched the "*Pura Vida*" label for certifying sustainably caught and processed fish and seafood.

Costa Rica's support to fisheries was 35% of the value of landings in 2018-20, the fifth highest share in the OECD (OECD, 2022[53]). Progress has been made in reducing support linked to input use, while increasing general support to improve efficiency and sustainability of fisheries and maintain coastal employment. However, in 2018-20, 46% of support was still given through tax exemptions on fuel use and other subsides that lower input costs. Such support tends to disproportionally benefit large fishing companies. It can encourage unsustainable fishing in the absence of effective fisheries management. Furthermore, it is more likely to increase illegal fishing, resulting in higher impacts on marine species and ecosystems, as well as higher GHG emissions (OECD, 2022[53]).

Recommendations on biodiversity conservation and sustainable use

Strengthening the policy framework

- Ensure the updated national biodiversity strategy for the post-2025 period provides a coherent policy framework consolidating strategies and programmes; thoroughly assess the results achieved by the current strategy and the costs of achieving them and identify the barriers to progress that should be addressed in the next period.
- Invest in improving the knowledge base on the country's biodiversity, particularly on marine and freshwater ecosystems, and the interlinkages between biodiversity, agriculture, fishery, tourism, and coastal and urban development.
- Approve an agreement on the scope of access to, and use of, genetic resources in indigenous territories and on the preservation of indigenous practices and knowledge; ratify the Nagoya Protocol on access and benefit sharing.

Boosting the effectiveness of area-based conservation measures

- Continue to strengthen the protected area system and improve its ecological representativeness and connectivity, by prioritising the ecologically significant terrestrial and marine areas that are less covered (such as coastal, mangroves and other wetlands, and the Costa Rica Thermal Dome); accelerate the identification of other effective area-based conservation measures and the establishment of a national framework for the implementation of these measures.
- Enforce the legislation requiring all municipalities to adopt adequate and sufficiently up-to-date land-use plans that consider environmental concerns, including impact on biodiversity, vulnerability to climate-related hazards and specific restrictions that may be needed in biological corridors; develop spatial marine plans and integrated management plans for the maritime terrestrial zones.
- Develop and systematically review the management plans for all protected areas, Ramsar wetlands and biological corridors; ensure they include mechanisms to evaluate management effectiveness, as well as ecosystem health or ecological integrity whenever possible; complete the establishment of local committees for the management of biological corridors.
- Accelerate identification of areas for biodiversity conservation and sustainable use to be managed by the Indigenous Peoples (*Áreas de Cuido*); further engage indigenous communities in the PPSA; increase the number of civil servants devoted to engaging and empowering indigenous communities.

Enhancing the contribution of tourism to biodiversity management

- Adopt a consistent methodology for setting entrance fees to protected areas, with a view to increase cost recovery; systematically adjust the fees for inflation, as required by law; consider differentiating fees between high and low seasons and reducing the gap between fees applied to local and foreign tourists, while applying discounts based on socio-economic status.
- Extend use of concession contracts for tourism-related services in protected areas; systematically implemented the technical guidelines for the management of concessions.

Reinforcing payments for ecosystem services

- Reinforce the PPSA and extend it to other ecosystems beyond forests; consider establishing a natural capital trust for financing the conservation and restoration of all ecosystem services, as well as a biodiversity offset system.
- Broaden the sources of finance, including fiscal resources, for the PPSA, with a view to delinking the financial viability of the programme from fuel tax revenue.

Mobilising finance for biodiversity

- Improve the timeliness and effectiveness of public spending for biodiversity conservation and sustainable use; further mainstream biodiversity in budget allocations; systematise statistics on budget and expenditure on biodiversity, as part of a broader rationalisation of the budget process.
- Expand the use of innovative financing mechanisms such as green bonds, conservation trust funds and debt-for-nature swap to raise revenue for financing biodiversity management.

Mainstreaming biodiversity in agriculture policy

- Remove tax exemptions for agrochemicals; consider introducing taxes based on the amount of active ingredients in pesticides and of nutrients in chemical fertilisers; ensure all pesticides are submitted to an appropriate environmental risk assessment and remove from the market those that exceed acceptable hazard levels for ecosystems and human health.
- Continue to phase out market-price support (given through border tariffs and minimum reference prices) for agricultural products; replace it with time-bound payments targeted to producers in need, as well as to encourage green farming practices.

Mainstreaming biodiversity in fishing policy

- Assess the biological sustainability of fish stocks; improve knowledge about the pressures on fish stocks and the impact of fishery policy on marine biodiversity.
- Continue to remove fishery support linked to input use, primarily fuel use; repurpose the saved financial resources for targeted direct income support to fishers in need and for improving the environmental sustainability of fishing; accept the 2022 World Trade Organization's Agreement on Fisheries Subsidies.

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Notes

[1] The GAM comprises the four largest cities (San José, Alajuela, Cartago and Heredia).

[2] The latest national GHG emission inventory, released in 2021, presents emission data up from 1990 to 2017.

[3] According to the definition of the OECD Climate Actions and Policies Measurement Framework, stringency is defined as the degree to which climate actions and policies encourage or enable GHG emissions mitigation at home or abroad.

[4] Geothermal is the main renewable source in Costa Rica, followed by hydro, biomass and wind.

[5] As of 2022, Costa Rica had installed about 740 000 smart meters.

[6] "Ecoins" is a virtual currency earned against the deposit of properly sorted waste to recognised collection centres. The system is organised through an online platform.

[7] As defined by the target 6.1.1. under SDG 6 on clean water and sanitation.

[8] The "Social Pact for the Implementation of the SDGs" was signed by representatives of the parliament, government and judiciary, local governments and various social stakeholders.

[9] BATs are "advanced and proven techniques for the prevention and control of industrial emissions and the wider environmental impact caused by industrial installations, which are developed at a scale that enables implementation under economically and technically viable conditions" (OECD, 2020[54]).

[10] Authorities include SETENA, Ministry of Health, National System of Conservation Areas, municipalities and others.

[11] This analysis is based on the Classification of the Functions of Government (COFOG) of the OECD National Accounts Statistics.

[12] The PPSA recognises four forest-related ecosystem services: carbon sequestration, water provision, biodiversity protection and natural scenic beauty.

[13] "Protection of biodiversity and landscape" is an expenditure category under the Classification of the Functions of Government (COFOG) of the national accounts statistics.

[14] Market-price support is defined as the "monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level" (OECD, 2022[51]).

Chapter 1. Environmental performance

Costa Rica made important strides in delinking environmental pressures from its fast economic growth in the last 15 years. It has expanded forest cover and electricity generation from renewable sources. However, cars are a growing source of emissions of greenhouse gases and air pollutants. Waste disposal still relies on landfills, and much wastewater is untreated. Pressures on the environment are likely to increase with sustained economic growth and rising living standards. This chapter provides an overview of Costa Rica's environmental achievements since 2010, and its remaining challenges. It reviews progress in moving towards a low-carbon and climate-resilient economy, controlling air pollution, ensuring sound waste services and improving management of water resources.

1.1. Introduction

Costa Rica is considered a global environmental leader, particularly in the field of biodiversity conservation. It is a megadiverse tropical country, rich in water and forest resources. It produces all its electricity from renewable energy sources. Costa Rica is a pioneer in nature-based tourism, which is a pillar of the economy. Income per capita has increased in the last two decades, thanks to strong economic growth. However, poverty and inequality remain stubbornly high.

Costa Rica has made some progress in improving its environmental performance since 2010. The continued increase of forest cover to nearly 60% of the land area is a major achievement. This has contributed to absorbing emissions of greenhouse gases (GHGs) and offsetting their continued growth. However, targeted policy measures are needed to address several remaining challenges. Energy use, especially for transport, has continued rising. Transport is a major source of GHG emissions and local air pollutants. Poor air quality affects most of the population. Most waste is still disposed of in landfills, and wastewater from homes and industries flows into rivers without treatment. Human pressures on the country's rich biodiversity have intensified, including unplanned urban development, tourism, farming and fishing (Chapter 3).

This chapter provides an overview of the main environmental trends observed in Costa Rica. It highlights the country's progress in the last decade towards its national and international goals, as well as remaining challenges for green growth and sustainable development. Where possible, trends are compared with those of other OECD member countries, as well as countries in Latin America and the Caribbean (LAC).

1.2. Promoting sustained and inclusive economic growth

1.2.1. Economic performance and structure of the economy

Costa Rica is an upper middle-income country that has continued to grow steadily over the last decades. In 2010-19, before the COVID-19 pandemic, the country's gross domestic product (GDP) grew on average by 3.2% per year, faster than in other major Latin American economies and the OECD. Costa Rica has one of the highest GDP per capita in LAC, but this is still less than half the OECD average (Figure 1.1).

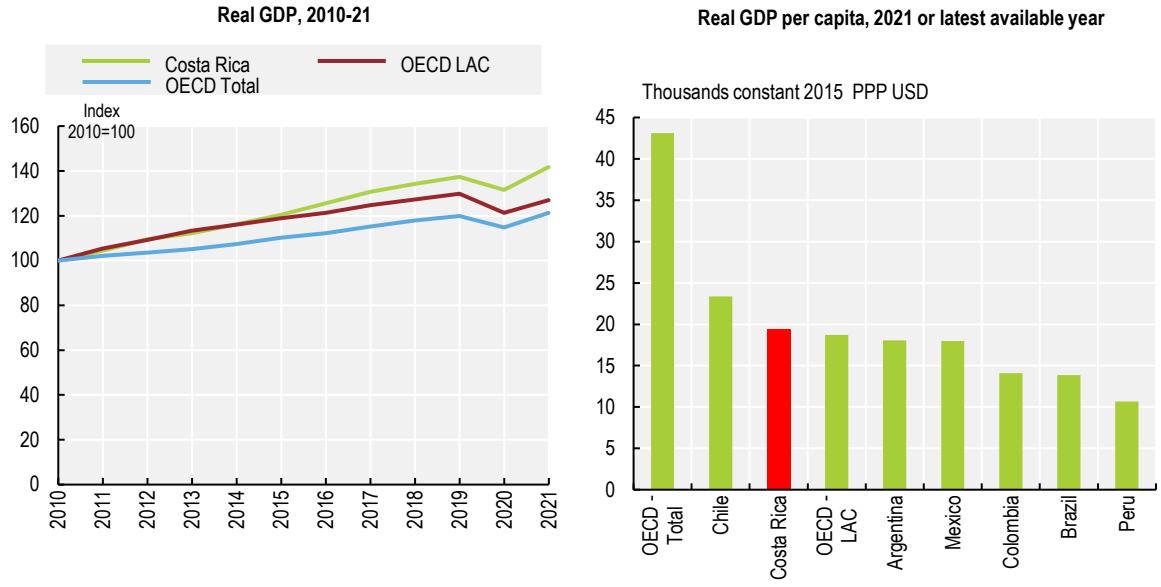
In the aftermath of the 1980 oil crisis, the country started transforming its economic profile from a predominantly rural base to a manufacturing- and service-based economy, thanks to more liberal trade policies and openness to foreign direct investment. Nonetheless, agriculture, forestry and fishing play a larger role than in most other OECD countries. They accounted for about 5% of value added in 2021, or nearly double the OECD average. The agro-food sector made up 38% of exported goods in 2021 (PROCOMER, 2022[1]). Costa Rica is the world's largest producer of pineapple. Industry accounted for over 18% of value added in 2021, below the OECD average, while services accounted for over 73% of value added, slightly above the OECD average. Before the pandemic, tourism accounted for 37% of service exports (OECD, 2022[2]).

The country's dependence on foreign markets for investment and trade makes it highly vulnerable to external shocks. GDP fell by 4% in 2020 due to the impact of the COVID-19 crisis with tourism most affected. The economy rebounded strongly and recovered to pre-crisis levels in 2021 (Figure 1.1). However, economic growth slowed down in 2022 and is expected to slow further in 2023 due to the complex international scenario (OECD, 2023[3]). The Russian war in Ukraine strengthened inflationary pressures, especially of energy and food.

The fiscal situation has recently improved, but maintaining fiscal prudence is critical for macroeconomic sustainability (OECD, 2023[3]). With its 2018 fiscal reform, Costa Rica worked to reduce its high public debt (which was nearly 70% of GDP in 2022). This has resulted in severe cuts to government spending. The

government has also been considering measures to raise more tax revenue. With about 45% of employment being informal, total tax revenue is low (23% of GDP in 2020). Nearly 10% of this revenue is from environment-related taxes (Chapter 2).

Figure 1.1. The economy has grown steadily over the last decades, but GDP per capita lags behind



Note: GDP data at constant 2015 purchasing power parity. OECD LAC average includes Latin American countries that are OECD members (Chile, Colombia, Costa Rica and Mexico) and candidate countries for accession to the OECD (Argentina, Brazil and Peru).
Source: OECD (2022), *National Accounts* (database); UNECLAC (2022), *CEPALSTAT Demographic and social* (database).

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1.2.2. Population's well-being

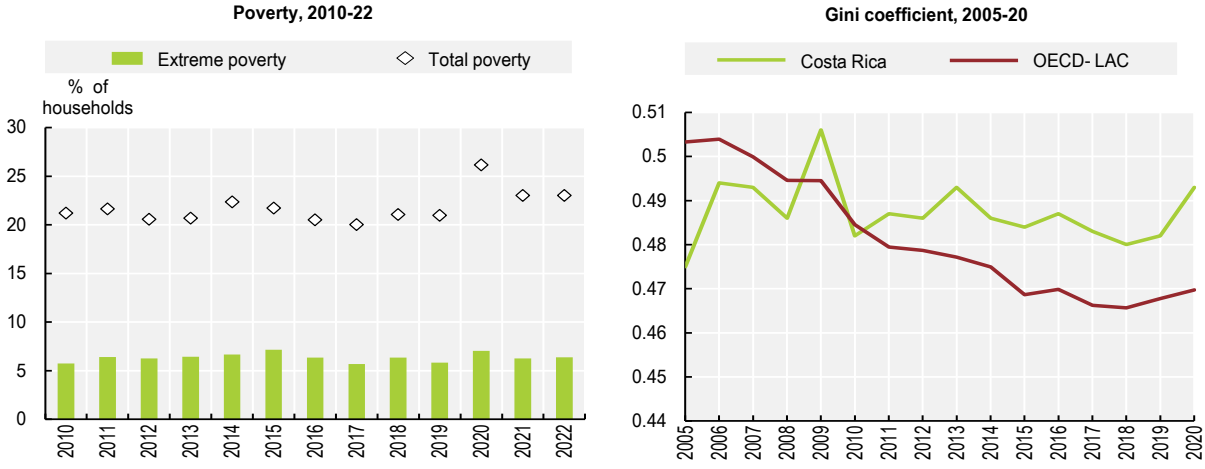
Higher population, urbanisation and tourist arrivals have exacerbated the pressure on the environment and the demand for public services, such as public transport, waste collection, and water supply and sanitation (WSS) (Sections 1.6, 1.8 and 1.9). Costa Rica's population increased by 11% in 2010-22 to reach about 5.2 million inhabitants and is projected to reach 5.4 million by 2025 (INEC, 2021[4]). Population density has steadily risen in the last decade from 88 inhabitants per square kilometre (km²) in 2010 to 101 inhabitants/km² in 2021, above the OECD average of 37 inhabitants/km². Urbanisation has progressed, with the share of the population living in urban areas reaching 72% in 2022 from about 60% a decade earlier. Most of the country's population (73%) live in the Greater Metropolitan Area (GAM) around San José (INEC, 2021[4]).[1] In 2018-19, prior to the pandemic, international tourist arrivals were more than 3.3 million in 2018-19, equivalent to about 60% of the country's population (OECD, 2022[2]). Tourism is highly seasonal and concentrates in relatively few areas of the country (Chapter 3).

Costa Rica's social outcomes could be improved further. Life expectancy (81) is in line with the OECD average and is among the highest in Latin America. Costa Rica has among the highest shares of women in managerial and ministerial positions in the OECD (OECD, 2023[5]). The country has achieved almost full enrolment in primary education. However, only half of the population aged 25-34 has completed upper secondary education, far from the OECD average (85%). Nearly 30% of Costa Ricans between 18 and 24

years are neither studying nor in formal employment. This is the fifth highest share in the world and the third highest in Latin America (OECD, 2022[6]).

Poverty remains a historic burden and inequality has kept rising. The challenging economic context and rising inflation can further deepen poverty and inequality. Poverty, defined as having an income below half the median household income of the total population, has fluctuated at more than 20% of households since 2010 (Figure 1.2). The COVID-19 pandemic triggered an increase of poverty in 2020. Extreme poverty affects around 6% of Costa Rica's households. Inequality is higher than in most LAC economies and OECD countries (Figure 1.2). The poorest 20% of households earn 4.2% of total income (OECD, 2021[7]).

Figure 1.2. Poverty increased during the pandemic, and inequality is trending upwards



Note: Panel A: Total poverty and extreme poverty indicate the share of households whose income falls below the respective poverty lines. The total poverty line is half the median household income of the total population. The extreme poverty line of USD 2.15 per person per day in 2017 purchasing power parities. Panel B: The Gini coefficient is based on disposable household income. OECD LAC average includes Latin American countries that are OECD members (Chile, Colombia, Costa Rica and Mexico) and candidate countries for accession to the OECD (Argentina, Brazil and Peru).

Source: INEC (2022), "Nivel de pobreza por LP según características de los hogares y las personas", *Encuesta Nacional de Hogares 2021 y 2022*; World Bank (2021), *Poverty and Equity* (database); World Bank (2022), *World Development Indicators* (database).

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1.3. Strengthening resilience to the impacts of climate change

1.3.1. Costa Rica's vulnerability to climate change

Costa Rica is highly vulnerable to the environmental, social and economic consequences of climate change. Nearly 80% of Costa Rica's population live in areas at high risk from multiple hazards, including those related to climate. These high-risk areas are also where 80% of the GDP is produced. Floods (42%) and storm surge (16%) were among the main climate-related extreme weather events that occurred in 1980-20 (World Bank Group, 2020[8]).[2] Extreme weather events took the lives of some 546 Costa Ricans between 1980 and 2017 (IMN, 2021[9]). The lack of adequate land-use and urban planning exacerbates the impact of natural disasters on infrastructure and settlements and increases people's vulnerability to climate-related events. Only a few land-use plans include an assessment of vulnerability to hydrogeological risks (CONARE, 2022[10]).

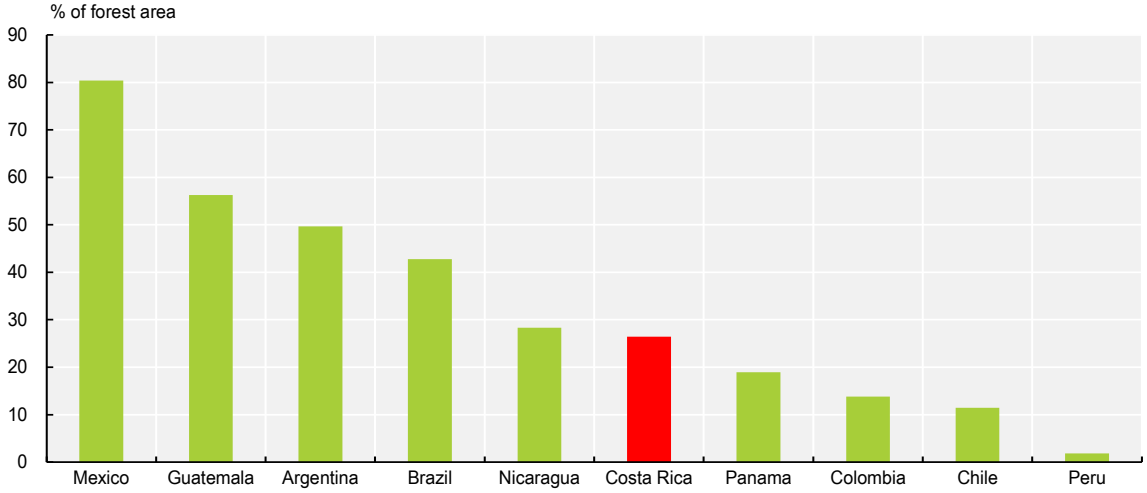
From 2016 to 2020, losses due to natural disasters amounted to USD 820 million. Tropical storm Nate alone caused the highest losses in the last 25 years, amounting to 1% of Costa Rica's GDP. The National Adaptation Policy 2018-30 indicates that costs of climate-related extreme weather events could reach between 1.6% and 2.5% of GDP by 2025, including to repair damaged water and transport infrastructure. Among the total costs caused by natural disasters between 2011 and 2018, 31% were assigned to the reparations of water systems, sewers, fords and other infrastructure; and 26% to roads and bridges (CNE, 2018[11]).

The year 2020 was the warmest of Costa Rica's history. Climate change is expected to severely reduce the country's water availability by the end of the century (ECLAC, 2018[12]). This will also affect the production capacity of hydroelectric power plants, which are the main source of electricity in the country (Section 1.5). While Costa Rica is a water-abundant country, climatic trends have exacerbated droughts in some key agricultural regions (OECD, 2017[13]). The country's agriculture is also exposed to extreme precipitation events.

Exposure to wildfire is significant and widespread (Figure 1.3). It represents a hazard to ecosystem services, notably biodiversity and carbon capture, as well as to human life. About 5-10% of the population in Costa Rica live in areas at very high risk of wildfire (OECD, 2022[14]). In 2019-20, about one-third of the country's forest-covered areas was exposed to very high or extreme wildfire danger (IEA/OECD, 2023[15]). The government should continue to pay attention to wildfire risk given the key role forests play in Costa Rica's climate change mitigation strategy (Section 1.4).

Figure 1.3. Costa Rica's forests are exposed to wildfire danger

Annual percentage of forest area exposed to very high or extreme wildfire danger for more than three consecutive days, average 2016-20, selected LAC countries.



Source: IEA/OECD (2023), "Climate-related hazards: Wildfire", *Environment Statistics*, (database).

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1.3.2. Policies to adapt to climate change impacts

The National Adaptation Policy 2015-30 and the National Climate Change Adaptation Plan (PNACC) 2022-26 aim to improve the resilience of infrastructure and economic sectors to climate-related natural disasters. The plan has a strong focus on reducing the climate vulnerability of tourism, water resources,

biodiversity and forestry. In 2021, the Ministry of Environment and Energy (MINAE) released three technical guidelines to support local governments in developing their plans to prepare for and adapt to climate change impacts.

Nature-based solutions (NbS), including the sustainable management of forest, marine and freshwater ecosystems, are among the main lines of action of the PNACC. This is welcome, as NbS may be more cost effective and adaptable to uncertain future climate conditions than traditional approaches, such as hard defences or other "grey" infrastructure (OECD, 2018[16]). Further extending the use of NbS would provide multiple benefits, including reducing GHG emissions and biodiversity loss, as well as creating employment and income opportunities for local communities (OECD, 2020[17]). For example, active collaboration with indigenous communities permitted the installation of checkpoints in overflow areas and early warning posts. However, additional investment will be needed to build climate-resilient infrastructure, retrofit existing infrastructure and protect the most vulnerable communities. Additional funding is also needed to reinforce capacity for responding to natural disasters. The National Commission of Emergencies has issued a binding resolution, assigning criminal and civil liability to officials in charge of risk assessment.

The PNACC acknowledges the urgent need to generate robust information on climate and hydrological risks and impacts, as well as to enhance the institutions' capacities to develop adaptation measures based on scientific knowledge. Some progress has been made with the establishment of the national system to monitor climate change (SINAMECC), which also maps adaptation actions. Costa Rica should build on this system to monitor the effectiveness of adaptation actions. Improved collaboration with the private sector, scientific institutions and local communities would help generate robust information to support climate adaptation policy and raise public awareness.

1.4. Moving towards a low-carbon economy

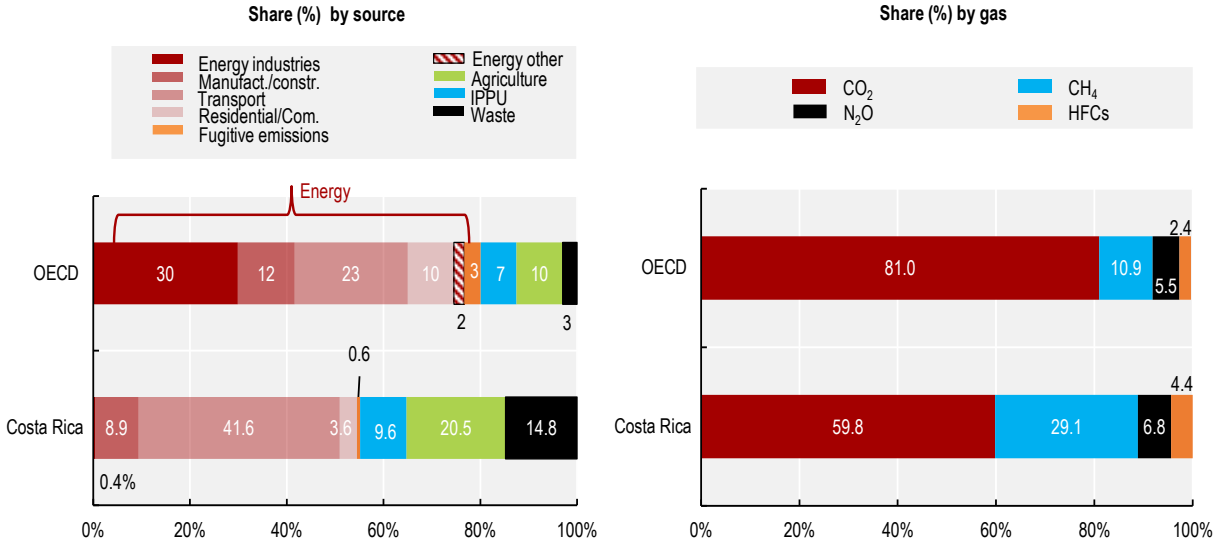
1.4.1. Greenhouse gas emissions profile and trends

Costa Rica's GHG emission profile differs from that of most other OECD countries. Most of the country's emissions are energy-related, but less than on average in the OECD (Figure 1.4). Thanks to the country's fully renewable-based electricity generation (Section 1.4), GHG emissions from energy industries are a minor share of total emissions. Fuel combustion in end-use sectors (manufacturing, transport, households and services) account for nearly all energy-related emissions. Transport, nearly exclusively by road, is the largest emission source making up 42% of emissions in 2017. Agriculture accounted for a fifth of GHG emissions in 2017, a larger share than on average in the OECD, reflecting the importance of agricultural production in Costa Rica's economy. With 15% of emissions in 2017, waste management is also a larger source of emissions than on average in the OECD, due to the reliance on landfills for waste disposal (Section 1.8). Agriculture and waste are major sources of methane, which made up nearly 30% of total emissions in 2017, more than on average in the OECD (Figure 1.4).

According to IEA data, GHG emissions from fuel combustion grew by 11% in 2010-21, at a lower rate than GDP. Emissions dropped in 2020 due to the pandemic but picked up again in 2021 (Figure 1.5). Emissions from road transport grew by over 30% in 2010-19 (OECD, 2023[19]). According to the 2021 national GHG emission inventory, Costa Rica's gross GHG emissions (i.e. excluding land use, land-use change and forestry, or LULUCF) grew by 12% in 2010-17. However, when considering LULUCF, net GHG emissions declined by 13% in the same period, thanks to increased removals from forests and agricultural soil (Figure 1.5; Chapter 3). Costa Rica did not have a 2020 GHG emission mitigation target under the United Nations Framework Convention on Climate Change (UNFCCC).

Figure 1.4. Energy accounts for a lower share of GHG emissions than on average in the OECD

GHG emissions in Costa Rica and OECD, 2017.



Note: The latest available year for Costa Rica's GHG emission data is 2017. The same year is used for the OECD average for comparison. "Energy other" refers to emissions from the energy sector that are not specified elsewhere. It corresponds to category 1.A.5. of the UNFCCC National Inventory Submissions.

Source: OECD (2023), "Air emissions by source", Environment Statistics; SINAMECC (2020), Inventario Nacional de Gases de Efecto Invernadero.

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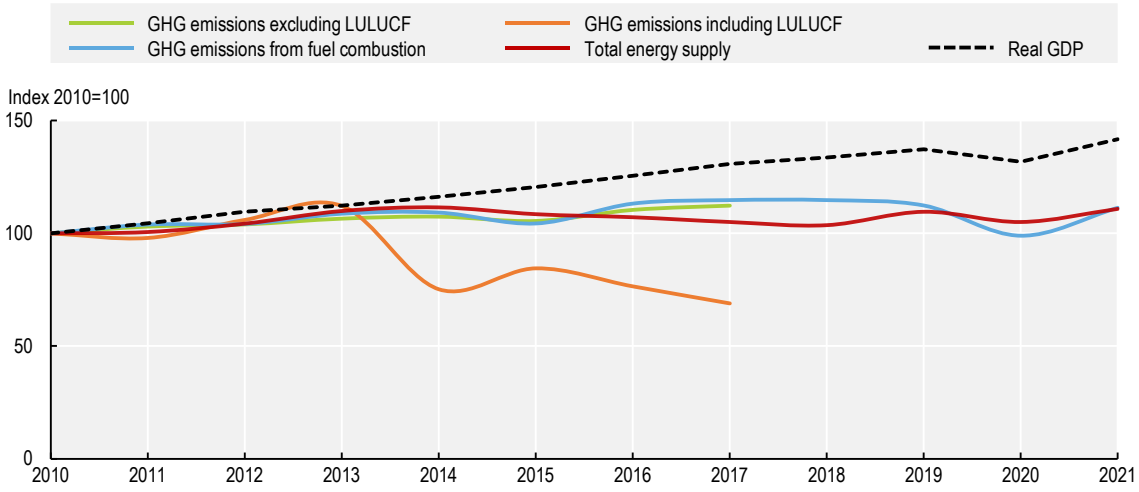
1.4.2. Progress on climate mitigation action

Costa Rica has intensified its efforts to curb energy-related emissions in the last decade. However, the range of implemented policies is limited and not sufficiently stringent. According to the OECD Climate Actions and Policies Measurement Framework (CAPMF), Costa Rica expanded its climate action in the transport, buildings, electricity and industry sectors in 2000-20, with an acceleration since 2013. In that period, the number of policies adopted increased from 5 to 16, out of 56 policies included in the CAPMF. The average stringency of adopted policies (defined as the degree to which climate actions and policies encourage or enable GHG emissions mitigation at home or abroad) also increased, from 5.6 in 2000 to 6.6 in 2020 (on a 0-10 scale). The progress in policy adoption is mainly linked to adoption of GHG emission reduction targets and improvement in climate governance.

Costa Rica's climate policy mix heavily relies on non-market-based instruments (regulations and voluntary approaches) and governance tools such as target setting and reporting. Measures in the buildings and industry sectors are mainly minimum energy performance standards or labels for appliances and industrial motors (Section 1.5). Market-based instruments are limited to fuel taxes, which apply mainly to the transport sector. There is no carbon tax in place (Chapter 2). In 2020, market-based instruments represented 6% of the measures to mitigate energy-related emissions adopted in Costa Rica. This is the lowest share among OECD countries, including those with an electricity mix comparable to that of Costa Rica (i.e. largely based on renewables and/or nuclear) (OECD, 2023[19]) (Figure 1.6).

Figure 1.5. GHG emissions grew in the last two decades but less quickly than Costa Rica's economy

Real GDP, GHG emissions and total energy supply, Costa Rica, 2010-21.



Note: Note: GDP = gross domestic product at constant USD 2015 prices; LULUCF = land use, land-use change and forestry.
Source: IEA (2023), IEA World Energy Statistics and Balances (database); OECD (2022), "OECD Economic Outlook No 112 (Edition 2022/2)", OECD Economic Outlook: Statistics and Projections (database); OECD (2023), Environment Statistics (database); OECD (2023), IEA CO_2 Emissions from Fuel Combustion Statistics: Greenhouse Gas Emissions from Energy.

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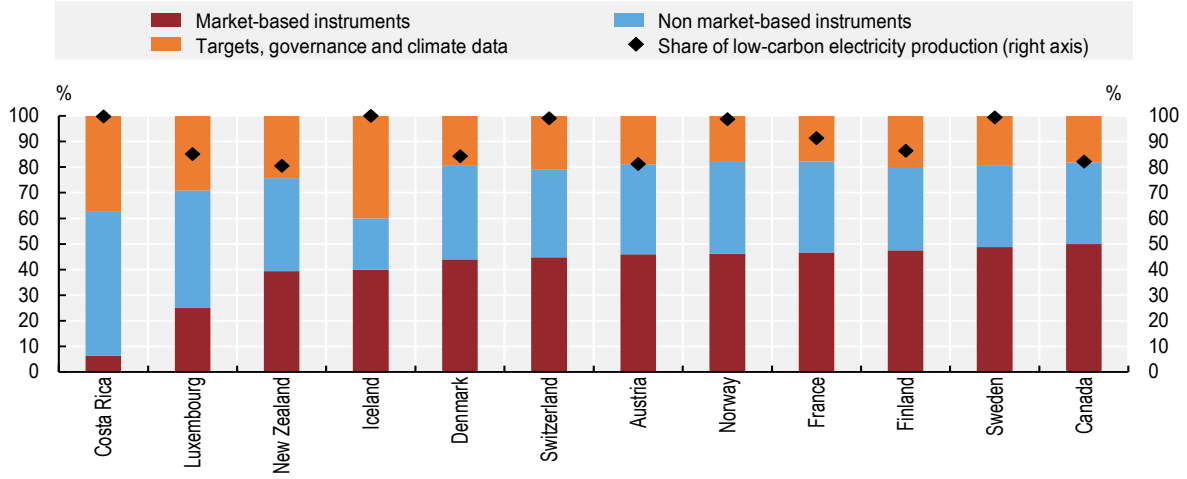
Policies in the agriculture sector focus on encouraging farmers to adopt practices that can reduce GHG emissions. Costa Rica launched two Nationally Appropriate Mitigation Actions (NAMAs) – for coffee production (2013) and livestock (2015). Within the NAMA framework, the government provides training and technical assistance to public servants, farmers and producers on practices and technology to mitigate GHG emissions, adapt to climate impacts and reduce the impact of farming on biodiversity (Chapter 3). The "Coffee NAMA" aims to reduce emissions of nitrous oxides (N_2O) by reducing fertiliser use, as well as to increase carbon sequestration in soil and improve efficiency in water and energy use. By 2020, the Coffee NAMA helped reduce 72 kilotonnes of carbon dioxide equivalent ($ktCO_2e$) compared to a target of 340 $ktCO_2e$ by 2021 (ICAFE, 2020[20]). The "Livestock NAMA" aims to mitigate methane emissions through practices such as rotational grazing, pasture improvement and silvopasture. The programme aims to enrol 70% of all herds and 60% of the total livestock area between 2015 and 2030. By 2021, almost 8% of the national herd and almost 13% of the grazing area were participating in the NAMA (Presidencia Costa Rica, 2021[21]). In 2022, in line with the National Decarbonisation Plan 2018-50, Costa Rica was piloting additional NAMAs in the musaceae (banana), rice and sugarcane sectors, with a view to covering all the highest emitting sectors. Another NAMA aims to curb emissions from waste disposal (Section 1.8).

The National Forest Development Plan 2011-20 and the National Strategy REDD+ (reducing carbon emissions from deforestation and forest degradation) are the foundation of Costa Rica's policy to increase carbon sink capacity by curbing deforestation and promoting afforestation and sustainable management of forest resources. The long-standing Programme of Payment for Environmental Services (PPSA) and the network of protected areas are the main instruments to implement this strategy (Chapter 3). They have been key to achieving a zero net deforestation rate and increasing the GHG absorption capacity of forests. The REDD+ Strategy aims to absorb 20 million tonnes (Mt) of CO_2e emissions in 2018-24 (MINAE and IMN, 2019[22]). In addition, the Sustainable Landscape Initiative (IPS) aims to reduce emissions from agriculture, forestry and other land use (AFOLU) sectors in 2022-30, in line with Costa Rica's commitments

under the 2021 Glasgow Declaration on Forests and Land Use. The IPS foresees to maintain zero net deforestation and curb forest clearance, reduce the use of fossil fuels, nitrogen fertilisers and agrochemicals in agriculture, implement good agricultural practices and invest in REDD+ actions to promote the use of forests over marginal agriculture.

Figure 1.6. Costa Rica's climate policy is the least oriented to markets among OECD countries with a low-carbon electricity mix

Climate policy mix by type of instruments, OECD countries with more than 80% of electricity from renewable sources and/or nuclear, 2020.



Note: The share of low-carbon electricity mix is equal to 100 minus the share of fossil fuels in electricity production. The Climate Action and Policies Measurement Framework database includes policies in the electricity, industry, transport and building sectors, as well as cross-sectoral policies. It excludes policies in the agriculture, forestry and waste sectors.
Source: OECD (2023), "Climate Action Dashboard", *International Programme for Action on Climate*, (database); IEA, "World indicators", *IEA World Energy Statistics and Balances* (database).

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Costa Rica should improve the system for monitoring and reporting GHG emissions as a priority. This is essential for evidence-based decision making and fulfilling the biannual reporting obligations under the Paris Agreement's Enhanced Transparency Framework. The complexity of data collection and processing means that national GHG emission inventories are issued with a time lag of several years, with the latest inventory (released in 2021) comprising data up to 2017. At the time of writing, the update of the GHG emission inventory was in progress. Many mitigation policies and measures lack clear objectives against which progress can be tracked, as well as related monitoring indicators. The government should increase funding for a faster and more agile development of data, including through the use of Earth observation technologies, and further encourage collaboration with the scientific community.

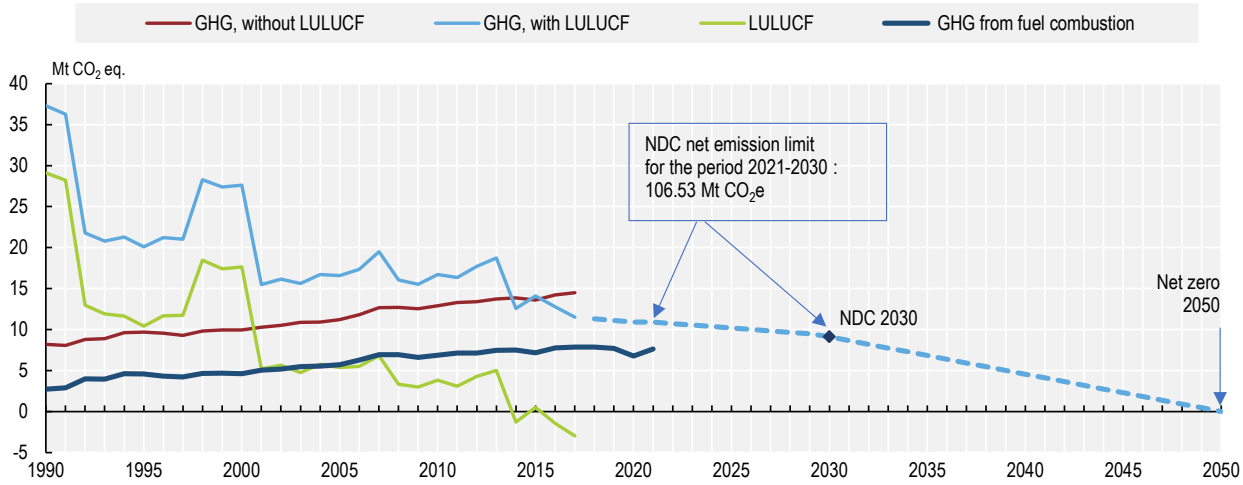
1.4.3. The path towards net zero

Costa Rica has raised its ambition towards a net-zero economy. In 2020, it submitted an update of its Nationally Determined Contribution (NDC) from 2015 to the UNFCCC. It committed to keep its cumulative net GHG emissions within 106.53 $MtCO_2eq$ in 2021-30, and to reach 9.1 $MtCO_2e$ in 2030. This represents an additional reduction of 0.26 million tCO_2e compared with the 2015 NDC. The new target implies cutting net emissions by about 20% below their 2017 level of 11.5 $MtCO_2eq$ (Figure 1.7). By achieving the target, net GHG emissions will be some 35% below their projected level under a business-as-usual scenario in

2030. Costa Rica is among the few LAC countries whose targets are unconditional on receiving international financial support.

Figure 1.7. Costa Rica aims to be carbon neutral by 2050

Historical and projected GHG emissions, targets and pathways to targets.



Note: GHG = greenhouse gas; LULUCF = land use, land-use change and forestry; NDC = Nationally Determined Contribution. Net GHG emissions include those from the LULUCF sector. Data on GHG emissions from fuel combustion are produced by the International Energy Agency (IEA).
Source: OECD (2023), *IEA CO_2 Emissions from Fuel Combustion Statistics: Greenhouse Gas Emissions from Energy*; MINAE (2020), Contribución Nacionalmente Determinada 2020; SINAMECC (2020), Inventario Nacional de Gases de Efecto Invernadero.

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In 2018, Costa Rica committed to achieving net zero by 2050 and adopted the National Decarbonisation Plan (PND for its initials in Spanish) 2018-50. This is among the few long-term decarbonisation strategies released by LAC countries (World Bank Group, 2022[23]).[3] The PND is more comprehensive than previous plans and strategies and has been developed through an extensive participatory process. It lays out the priorities to decarbonise the economy and the necessary policy and institutional reforms (Box 1.1). The 2030 NDC is in line with the pathways to reach the 2050 net-zero goal set by the PND. Achieving these targets relies heavily on carbon sinks (Figure 1.7). However, as they grow older, secondary forests will tend to lose their absorption capacity (MINAE, 2017[24]). Therefore, a reduced pace of afforestation and reforestation could severely undermine the achievement of climate mitigation targets (Chapter 3).

The implementation of the PND was divided into three phases to measure the achievement of intermediate targets: 2019-22, 2023-30 and 2031-50. Costa Rica did not meet all its intermediate targets for the initial phase. As of February 2022, it had met 61% of these objectives, and the government expected to achieve 83% of them by the end of 2022. Most of the targets achieved or on track for achievement related to sustainable buildings, the industrial sector, agri-food systems and territorial management (Government of Costa Rica, 2022[25]). The targets related to transport and waste were missed.

The authorities should thoroughly analyse the results of the first PND phase and harness the lessons learnt to improve implementation of the 2023-30 phase. To reach its 2030 NDC and carbon neutrality by 2050, Costa Rica should address planning, regulatory and political economy barriers (Groves et al., 2020[26]). There is a need to improve co-ordination of mitigation actions between the central government and the municipalities, which share responsibilities over the large emitting sectors of transport and waste management. The administrative and financial capacity of municipalities should be strengthened. Securing

the necessary public funding and mobilising private finance towards low-carbon investment will be crucial for the transition to a net-zero economy (Chapter 2). Achieving the PND targets would require massive investments, estimated at USD 37 billion in 2020-50, and generate more than USD 40 billion in net benefits (Groves et al., 2020[26]). Implementing the PND would also yield numerous co-benefits. Reduced pollution would improve health, electrification would save fuel costs; and preserved and enhanced forests would preserve ecosystem services (Chapter 3).

Box 1.1. Costa Rica's National Decarbonisation Plan to 2050

The PND lays out the strategy and actions to decarbonise the economy, articulated into ten main axes and eight transversal strategies, including policy and institutional reforms (e.g. green fiscal reform; attraction of foreign direct investment for the low-carbon transformation; and digitalisation, among others). At the heart of the PND are:

- taking advantage of the country's significant natural resource endowment, specifically its renewable hydro, solar and wind resources, which can potentially provide clean electricity for the whole economy
- improving efficiency of and access to public transport
- preserving and enhancing the carbon sequestration capacity of forest resources
- improving processes to reduce energy use and carbon intensity in buildings, industry, agriculture and livestock
- collecting, treating and re-using liquid and solid waste.

Under a business-as-usual scenario, Costa Rica's net GHG emissions could increase from about 12 $MtCO_2e$ in 2018 to almost 19 $MtCO_2e$ by 2050. Under baseline assumptions, the largest reductions in net emissions would occur in the transport sector (-7.4 $MtCO_2e$ by 2050), as well as agricultural, livestock and forestry sectors (-6 $MtCO_2e$). Reductions in buildings, industry and waste account for an additional reduction of 5.4 $MtCO_2e$.

The PND covers all sectors of the economy and all GHGs. Some key actions and targets are expected to deliver the largest emission abatement. These include the electrification of public and private vehicle fleet; increased reliance on public transport; electric trains for freight and passengers, especially in the Greater Metropolitan Area; upgraded electricity transmission and distribution systems to support electrification of the economy; improved energy efficiency and shifting to electricity use in buildings and industry; increased waste recycling and composting; completed sanitation and sewer system coverage; improved farming practices to reduce emissions from agriculture and husbandry; maintenance and increase of forest coverage.

Source: (Government of Costa Rica, 2018[27]; Groves et al., 2020[26]).

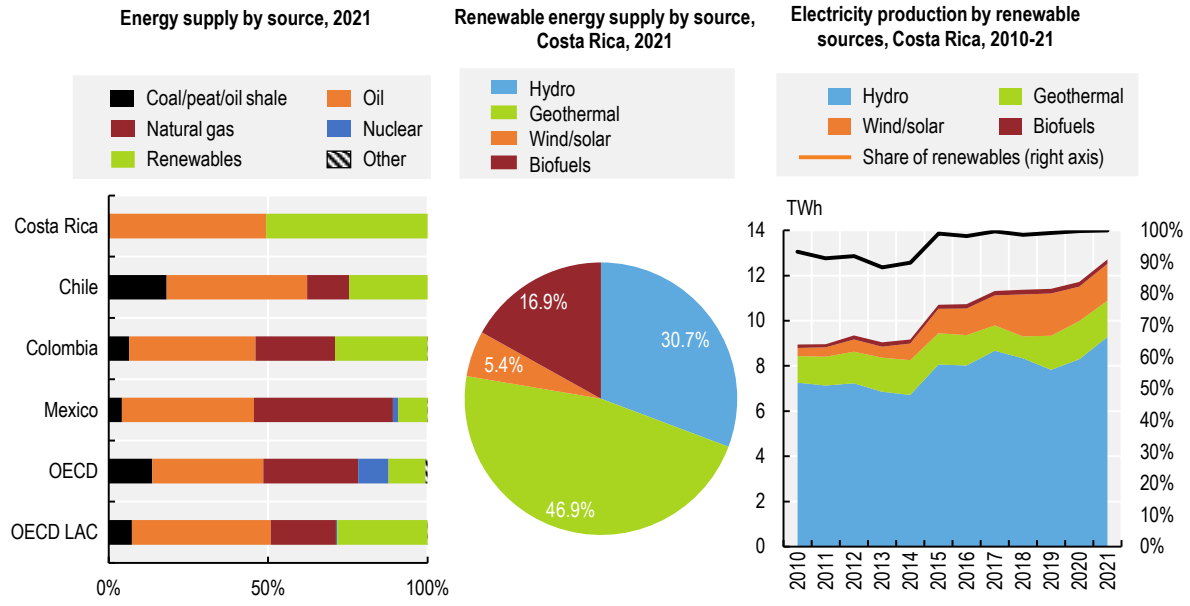
1.5. Accelerating the clean energy transition

1.5.1. Energy supply

Costa Rica's long-standing use of renewables is an asset for reaching net zero. Renewables accounted for nearly half of total energy supply (TES) for most of the last ten years. This is well above the OECD average and the highest share among Latin American countries in the OECD (Figure 1.8). Notably, electricity generation has been based on renewable energy sources since 2015 (Figure 1.8). However, Costa Rica's energy supply still relies heavily on oil products, which are primarily used for transport

purposes. Oil, which is fully imported, accounted for the other half of TES in 2021. In 2019, the government suspended oil exploration and exploitation projects on its territory until 2050. The country is a founding member of the Beyond Oil and Gas Alliance of governments and stakeholders, which was launched at the 2021 UNFCCC Conference of the Parties to facilitate the managed phase-out of oil and gas production.

Figure 1.8. Renewables account for a large share of energy supply



Note: Total primary energy supply excludes electricity trade. OECD LAC average includes Chile, Colombia, Costa Rica and Mexico.
Source: IEA (2023), "World energy statistics", *IEA World Energy Statistics and Balances* (database).

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Most renewable energy is of geothermal source, which accounted for 47% of all primary energy from renewables and nearly one-quarter of TES in 2021. In the same year, hydropower accounted for 31% of renewable primary energy and 16% of TES, followed by biomass and wind (Figure 1.8). Electricity generation from renewables has increased steadily over the past decade (Figure 1.8). This is mainly driven by more use of hydropower and wind. Hydropower is the main source of electricity generation (73% of power output in 2021), followed by wind and geothermal (about 12.5% each).

Electricity demand has been rising, increasing by over 30% in 2010-20. Electricity demand is projected to grow nearly four-fold between 2020 and 2050 to achieve Costa Rica's net-zero goal (Box 1.1). An electricity-based transport sector will account for nearly half of power consumption forecasted in 2050. Electricity use in industry is projected to increase more than three-fold and electricity use in residential and commercial buildings is projected to double by 2050 (Groves et al., 2020[26]).

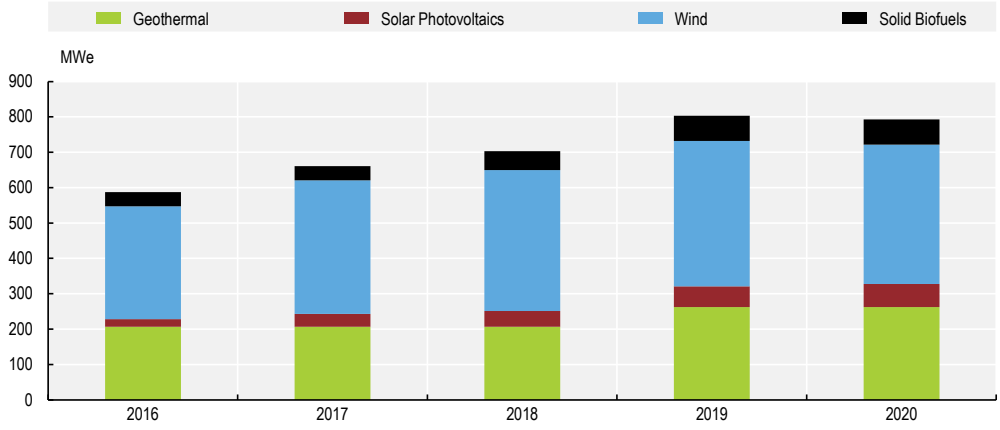
Expanding and diversifying renewable electricity generation capacity will be crucial to maintain clean electricity generation and decarbonise energy use. Costa Rica has an excess electricity generation capacity, which can be used to meet the projected additional electricity demand at low costs (Groves et al., 2020[26]). However, climate change is projected to severely affect hydropower production capacity by the end of the century, mainly due to a consistent decrease in precipitation and runoff (IEA, 2021[28]). In addition, most hydropower potential has already been exploited. For example, about 35% of the remaining hydropower potential is inside indigenous zones, and another 20% in national parks and forest reserves.

A large part of potential geothermal generation is also in national parks (Hernández-Blanco and Costanza, 2022[29]).

To address this challenge, the seventh National Energy Plan (PNE) for 2015-30 promotes investment in renewable electricity other than hydro. Installed capacity of wind and solar power technologies has increased (Figure 1.9). Electricity generation from wind can complement hydropower throughout the year.[4] Solar photovoltaics (PV) has limited potential in Costa Rica due to high cloudiness but can be used to power buildings. Installed capacity for biomass also increased from a small base. Most of the new capacity uses agricultural organic waste, mainly bagasse from sugar cane mills.[5] Expanding energy generation from biomass will contribute to both waste recovery and reducing GHG emissions. The government plans to expand production and use of biofuels from agricultural organic waste to replace transport fuels. Work is ongoing to develop a national bioenergy strategy, as indicated by the PNE. The state-owned electricity company, Costa Rican Electricity Institute (ICE), plans to start generating wave power by 2030 (Hernández-Blanco and Costanza, 2022[29]).

Figure 1.9. Costa Rica has increasingly invested in wind, solar and biomass electricity generation capacity

Total renewable electricity generation capacity (excluding hydro) in Costa Rica, 2016-20.



Source: IEA (2023), *IEA Electricity Information Statistics* (database).

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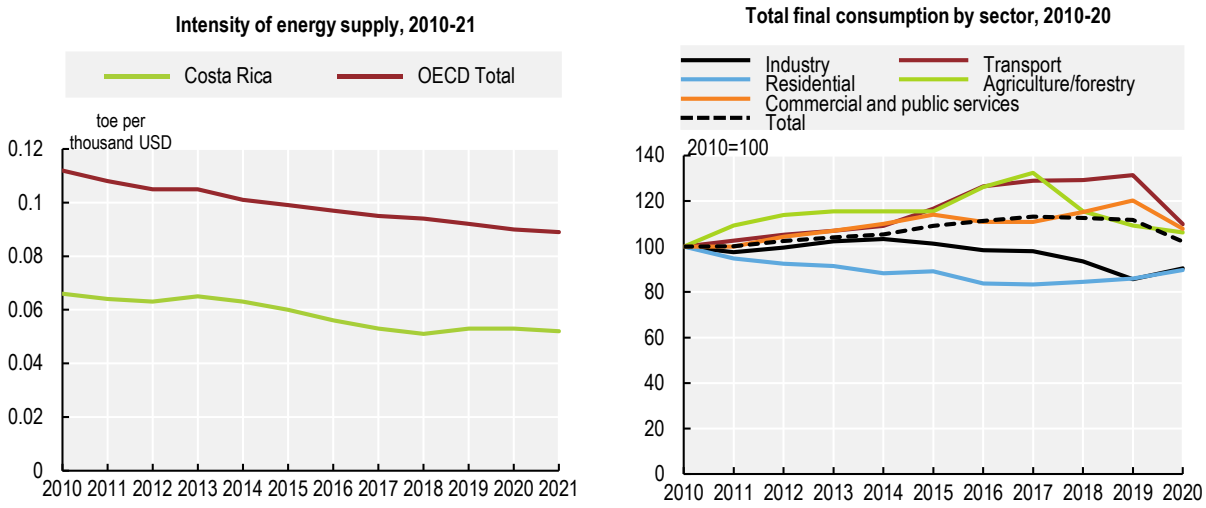
Costa Rica needs to upgrade its electricity grids and improve the operating efficiency of power systems to integrate rising generation from variable renewable sources and support growing electricity generation and use, particularly in transport. As recommended by OECD (2023[3]), removing the various regulatory barriers to competition in the electricity sector will be essential to encourage investment and innovation in the sector. ICE is the largest single producer and distributor of electricity, in addition to being the transmission system operator. Only 30% of electricity can be produced by private companies, on the basis of tendering contracts with ICE. There is also a cap on foreign ownership of power generating companies.[6] In 2022, the government presented a bill to reform the national electricity system, with a view to making it more efficient and removing some of the barriers to competition in the electricity market.

1.5.2. Energy use and intensities

In 2010-21, energy use increased at a slower pace than the economy, leading to a 20% decline in the economy's energy intensity, in line with the trends observed on average in the OECD (Figure 1.10). The

energy intensity of Costa Rica's economy is less than 60% of the OECD average (see Basic Statistics), reflecting lower average income and living standards. Nonetheless, energy consumption trends are of concern, especially in the transport, residential and commercial sectors.

Figure 1.10. Energy intensity has declined, but energy use trends in transport and services are of concern



Note: Intensity of primary energy supply is computed as TES/GDP (toe per thousand 2015 USD PPP).
Source: IEA (2023), "World energy statistics", *IEA World Energy Statistics and Balances* (database).

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Transport is the main energy consumer, followed by industry. Road transport makes up nearly all energy use for transport purposes and accounts for nearly half of total final energy consumption (TFC). Energy use in road transport grew by over 30% in 2010-19. In 2020, despite a remarkable dip in consumption – linked to mobility restrictions related to COVID-19 – energy consumption for road transport was still 10% higher than at the beginning of the decade (Figure 1.10). Industry, mostly food processing, accounted for 23% of TFC in 2020. Industrial energy use declined in the last decade, following changes in production. Residential and commercial were 24% of energy use. Energy use in the service sector dropped with the pandemic, which hit tourism hard, but is likely to recover its previously rising trend. After a consistent decline in 2006-17, energy use in households picked up again at the end of the decade (Figure 1.10). Virtually the whole population has access to electricity in Costa Rica. The 0.3% of the population not covered live in rural areas.

A broader set of regulatory, fiscal and education measures is needed to encourage energy savings. Measures to improve energy efficiency have been limited. They include minimum energy performance standards (MEPS) and mandatory labels for some electrical household appliances and industrial motors. There are no MEPS for buildings, but a voluntary labelling and technical guidance for sustainable buildings has been implemented since 2020. A regulation for sustainable social housing, including energy efficiency parameters, was under development at the time of writing. The energy labelling criteria are aligned with the standards defined by the International Organization for Standardization and are co-ordinated with other countries in the region. The 1994 law on the rational use of energy allows for establishing fiscal incentives aimed at encouraging energy consumers, including companies, to acquire equipment producing small-scale renewable energy, high-efficiency equipment and electric vehicles (EVs). The goods and equipment benefiting from the incentives are defined by ministerial decree; the last one was issued in 2021.

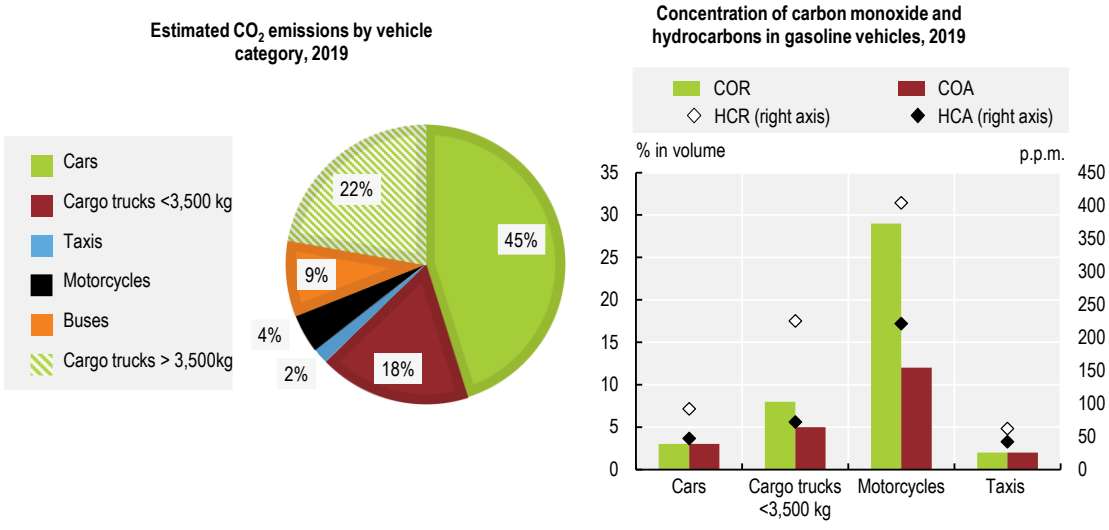
In line with the PNE 2015-30, the government developed a National Strategy for Smart Grids 2021-31 to improve the operating efficiency of the electrical system, enhance electricity price competition and support diversification of renewable power sources and electrification of end-uses. The strategy set a target of 1 million smart meters installed by 2026, equivalent to about 60% of households. As of 2022, Costa Rica was on track to achieve the target, with about 740 000 smart meters installed, up from about 100 000 in 2019. Smart metering would also contribute to demand management and help consumers understand their energy use and adapt their consumption to prices.

1.6. Decarbonising transport

1.6.1. Mobility patterns

Costa Rica's heavy reliance on road transport has led to rising environmental pressures. Transport, predominantly by road, was nearly half of total energy consumption and three-quarters of GHG emissions from fuel combustion in 2020 (OECD, 2023[18]). Energy use for road transport and related GHG emissions grew by over 30% in 2010-19 (before dropping with the pandemic). Private cars account for most fuel use and related CO_2 emissions, followed by freight vehicles (Figure 1.11). Road vehicles, and especially motorcycles, are also a major source of air pollutants such as carbon monoxide (CO) and hydrocarbons (Figure 1.11). More than 80% of vehicles run on petrol and 18% on diesel. The vehicle fleet has grown by about 60% in the last decade, but more than half of vehicles are over ten years old.

Figure 1.11. Road vehicles are a major source of emissions of GHGs and air pollutants



Note: Data of the concentration of carbon monoxide and hydrocarbons correspond to vehicles that followed the RVT gas emissions test. COR = concentration of carbon monoxide at idle speed. COA = concentration of carbon monoxide at accelerated speed. HCR = concentration of hydrocarbons at idle speed. HCA = concentration of hydrocarbons at accelerated speed. P.P.M. = parts per million.
Source: CONARE (2020), *Informe Estado de la Nación 2020*.

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In the GAM, the share of passenger travel by buses declined from 41% in 2007 to 34% in 2017 (CONARE, 2020[30]). Urban and interurban railway services are limited; trains account for a minor share of public transport. For many people, generally corresponding to students and lower-income households,

public transport is the only means of travel. Information on cycling and walking is limited. In 2015, cycling accounted for about 2% of total trips. Roads are mostly not safe for walking and cycling due to the lack of sidewalks and bicycle lanes. In 2012-15, 31% of transport-related fatalities in Costa Rica were cyclists and pedestrians (CONARE, 2018[31]).

Costa Rica's increasing car dependence arises from a long-standing policy and investment focus on road infrastructure, combined with unplanned urban development that has neglected access to public transport. The road network is extensive but of generally poor quality. It has suffered from years of underspending on maintenance due to weak governance, planning and execution (Chapter 2). Most of Costa Rica's municipalities lack an up-to-date or completed land-use plan (Chapter 3). Much of the new built area is at the margin of urban areas, contributing to urban sprawl and car dependence. On average, settlements built between 2016 and 2019 were nearly 2 kilometres (km) from a bus stop (compared to a commonly accepted walking distance of 400-500 metres), with a large variability between the GAM and rural zones (CONARE, 2020[30]).

The GAM has no integrated public transport system. Most bus lines pass through San José centre and interconnect only there, if at all (CONARE, 2018[31]). Nearly 90 private bus companies operate over 400 routes, based on concession contracts. Each company sets its own prices for its routes, which leads to substantially different fares for similar journeys (CONARE, 2018[31]). Bus frequency is generally inadequate to serve demand. Access to public transport varies substantially within the GAM. Two-thirds of the GAM population have good access to the bus network. However, the distance from a bus stop increases towards the outskirts of the GAM, where the lower-income households live (CONARE, 2021[32]). Several municipalities have implemented actions to improve walkability and develop cycling infrastructure. However, progress has been slow and fragmented.

Inadequate public transport services, chaotic building development, and poor road design and quality have led to heavy congestion on the main national roads and in the four metropolitan areas of the GAM (San José, Alajuela, Heredia and Cartago). In a vicious circle, heavy congestion reduces public transport performance and attractiveness. The metropolitan area of San José is also a major crossroads for road freight. The only tool to manage congestion in the metropolitan area has been a driving restriction based on licence plates during weekdays.[7] This measure has largely been ineffective because many households own more than one car, which allows them to circumvent the restriction. In 2017, the social costs of transport in the GAM were estimated at USD 3.1 billion (or about 5% of GDP), more than 90% of which were linked to accidents and road congestion (CONARE, 2018[31]).[8]

Improving public transport, and walking and cycling conditions, is of outmost urgency to reduce car dependence and extend access to employment and social opportunities. The PND 2018-50 aims to reach 32.5% of passenger travels covered by public transport by 2035 (from 25% in 2018). It also aims to increase the share of travels by walking and cycling to 4% by 2035. The targets by 2050 are 45% for public transport and 10% for walking and cycling.

Some progress has been made in modernising bus transport in the GAM in recent years, including setting 68 km of priority bus lanes and assigning some concession contracts by sector (area) of the city rather than by route. In 2020, the Ministry of Public Infrastructure and Transport (MOPT) launched a plan to implement an integrated public transport system in the GAM in 2020-35. Among other goals, it aims to complete the *sectorización* of bus lines, grouping them into geographical sectors and sub-sectors. According to estimates, completing this process would increase travel speed by 61% and reduce GHG emissions by 506 tCO_2 per year (CONARE, 2018[31]).

The institutional setting for transport policy is complex. In addition to the role of the MOPT, three autonomous entities and several councils are each responsible for a transport mode or infrastructure type. In 2005, responsibility over the network of municipal roads was transferred to municipalities. However, the transfer of financial and human resources needed to comply with this legislative change has not been

completed. Lack of co-ordination between the Costa Rican Institute of Railways and the Council of Public Transport hinders development of an intermodal transport system in the GAM (CONARE, 2018[31]).

The establishment of a public metropolitan transport authority could improve co-ordination of planning, investment and operation of transport infrastructure and services across municipalities in the GAM. Such an authority could also be tasked with implementing an integrated and multimodal transport system. In several large metropolitan areas in the world, including Barcelona, London, Medellín, Mexico City, Paris and Sao Paulo, the establishment of metropolitan transport authorities has been key to substantially improving public transport performance (ITF, 2018[33]; UITP, 2022[34]).

1.6.2. Electric transport

The PND 2018-30 puts great emphasis on electrifying public and private transport. It aims to achieve a 30% portion of EVs in the fleets of both buses and light vehicles (including cars) by 2035. It also sets the targets of 85% of EVs in the public fleet and 95% of EVs in the private fleet by 2050. Despite a rapid increase in sales over the last few years, EVs still represented 0.5% of the vehicle fleet in 2021 (Figure 4 in Assessment and recommendations). This limited deployment is common in other middle-income countries. Costa Rica shares with other emerging economies some challenges to develop electromobility, including weak electricity grids, reliance on second-hand vehicles and lack of fuel efficiency or CO_2 emission standards for vehicles (IEA, 2022[35]).

In line with the 2018 National Plan for Electric Transport (PNTE), the government approved the regulatory framework for the promotion of EVs and installation of the charging network. EVs and their spare parts benefit from several tax exemptions (general sales tax, selective consumption tax and customs value tax). In 2020, these exemptions amounted to CRC 365 million (about USD 650 000) (Ministerio de Hacienda, 2021[36]). In addition, private EVs benefit from other incentives such as green plates and dedicated and free parking spaces. The PNTE also foresees introducing favourable electric tariffs for EV recharging. The experience of the leading EV markets shows that EV purchase subsidies should be combined with stringent vehicle efficiency and/or CO_2 standards and higher taxation of internal combustion engine vehicles (ICEVs) (Chapter 2). This is crucial to reduce the difference in purchase price or lifetime cost between EVs and ICEVs. As the country's EV market matures, purchase subsidies should be gradually phased out (IEA, 2022[35]). Costa Rica should also continue to support the expansion of publicly available charging infrastructure and ensure equitable access to them for all communities. As of 2022, the network included 48 charging stations and 30 semi-fast chargers.

Measures are in place to foster EV deployment in the public sector and for public transport. As of 2022, the procurement procedures of 37 public institutions were favourable to EV purchase. Electric buses have been piloted on two routes in the GAM. Extending the use of electric buses faces various barriers, notably high investment and maintenance costs. The investment payback period goes well beyond the seven-year concession period. At the time of writing, draft legislation aimed to extend the concession term to 15 years to facilitate cost recovery. The government should strengthen the emissions standards for diesel buses and consider providing financial assistance to buy electric buses with a view to limiting the impact of high investment costs on bus fares.

The combination of EVs, improved public transport system and implementation of European-like CO_2 emission standards for vehicles would reduce transport-related GHG emissions by 10% per year (CONARE, 2018[31]). As in other emerging economies, electrification of road transport should prioritise two/three-wheelers and urban buses, which are the most cost-competitive vehicle categories (IEA, 2022[35]). The uptake of electric motorbikes would also contribute to reducing air pollution (Figure 1.11). Lower-income households depend on public transport for their mobility needs and would not be able to afford a private EV, even if subsidised. Consequently, investing in an extended and electricity-based public transport would help reduce car dependence and avoid exacerbating inequality.

1.6.3. Using green hydrogen for transport

With its large renewable power base and water resources (Section 1.9), Costa Rica is in a good position to produce and deploy green hydrogen to fuel transport vehicles and industry. As the country depends on imported fossil fuels, developing local clean fuels will not only decarbonise the transport sector but also improve its trade balance (Cordonnier and Saygin, 2022[37]). Hydrogen could also be used to power hard-to-abate sectors that use oil, such as the chemical and steel industry, aviation and shipping.

Costa Rica has been piloting the application of hydrogen produced through its fully renewable electricity in the transport sector (Box 1.2). The PNE 2015-30 foresees development of a national hydrogen strategy. A green hydrogen bill was under discussion at the time of writing. However, there is a need to create a sufficiently large demand for hydrogen by stimulating deployment of hydrogen fuel cell buses and trucks (Cordonnier and Saygin, 2022[37]). Significant infrastructure investment and technology will be needed to produce green hydrogen on a large scale and improve safety of its storage and transport. In addition, given the sizeable amount of water required for hydrogen production, this could compete with other water uses such as agriculture and drinking water supply. These trade-offs, as well as the opportunity of technological development, need to be carefully assessed.

Box 1.2. The Costa Rica Hydrogen Transportation Ecosystem project

The Costa Rica Hydrogen Transportation Ecosystem project was developed over the past ten years with a total investment of USD 8.8 million (49% from the company Ad Astra Energy and Environmental Services, 35% from the Costa Rican government, 9% from non-governmental organisations, 7% from other investments and sponsorships). The project aims to test the technology and understand how to operate green hydrogen infrastructure in tropical climates and to mitigate risks related to high temperatures. The project started operations in 2018 in the Guacanaste province. Hydrogen was produced with solar and wind electricity. This green hydrogen was then used in a “Nyuti” bus, the first hydrogen-based transport unit in Costa Rica. The Nyuti bus can transport 35 passengers, has a range of 338 kilometres (km) and a speed limit of 110 km per hour. Since 2019, the green hydrogen project has been feeding a fleet of four Toyota Mirai that operate in the tourist areas of Guanacaste.

The project will be continued by the joint venture ProNova Energy (between Ad Astra and Mesoamerica, a renewable energy investment company), which will expand the electrolyser capacity of the current pilot project. This project, expected to cost USD 6 million and become operational in 2024, will produce 450 kilogrammes of hydrogen per day and operate a fleet of around ten buses or trucks. Under the pay-per-use model under discussion, Ad Astra/ProNova Energy plans to lease vehicles (including the fuel) at a given tariff per kilometre.

Source: (Cordonnier and Saygin, 2022[37]).

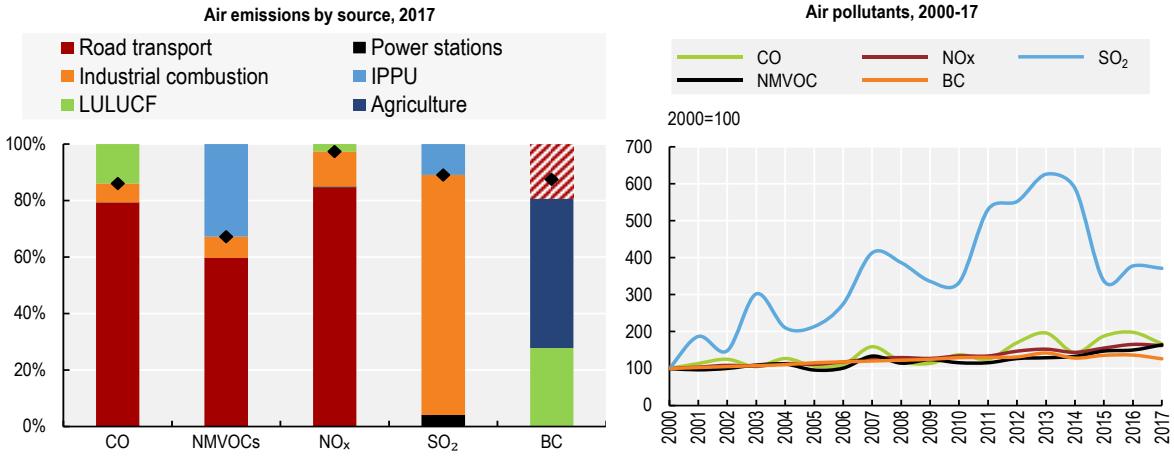
1.7. Improving air quality

1.7.1. Emissions of air pollutants

Air pollution emissions have gradually increased over the last 20 years in Costa Rica. Sulphur dioxide (SO_2) and non-methane volatile organic compounds (NMVOCs) are the air pollutants with the highest increase, followed by CO, NO_x and black carbon (BC). NO_x emissions, mostly from road vehicles, have almost doubled since 2000 (OECD, 2022[38]). Road transport is also a major source of NMVOCs and CO emissions (Figure 1.12). Sulphur oxide (SO_x) emissions declined between 2014 and 2017 thanks to a

gradual switch to lower sulphur content fuels in industry, the largest SO_x source. However, in 2017, SO_x emissions were three times higher than at the beginning of the century (Figure 1.12). Fuel combustion, especially from vehicles, is the main cause of air pollutants in the country, accounting for 70-95% of total emissions (Figure 1.12).

Figure 1.12. Emissions have more than doubled for most air pollutants in Costa Rica



Note: BC = black carbon. CO = carbon monoxide. NMVOCs = non-methane volatile organic compounds. NOx: nitrogen oxides. SO_2 = sulphur dioxide. Data after 2017 are not yet available. Data for SO_2 refer to stationary sources only.
Source: MINAE and IMN (2021), Inventario Nacional de gases de efecto invernadero y absorción de carbono 1990-2017; OECD (2022), "Air and climate: Air emissions by source", *OECD Environment Statistics* (database).

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1.7.2. Air quality and exposure to pollutant concentrations

Nearly all Costa Rica's population is exposed to harmful levels of air pollution from fine particulate matter ($PM_{2.5}$), i.e. to $PM_{2.5}$ concentrations above 10 microgrammes per cubic metre (µg/m^3) (OECD, 2023[40]). This poses risks to human health as it is above the 2021 World Health Organization (WHO) Air Quality Guidelines of 5 µg/m^3 of $PM_{2.5}$. Much of the population is exposed to even higher $PM_{2.5}$ concentration (above 15 µg/m^3), with some variation across provinces (Figure 1.13). Exposure to PM_{10} concentrations has declined since 2010 and concentrations of $PM_{2.5}$ were relatively stable between 2013 and 2020. Since 2013, when $PM_{2.5}$ monitoring started in the GAM,[9] the annual average concentration at all sites has been above 15 µg/m^3 (MINSA et al., 2020[39]).

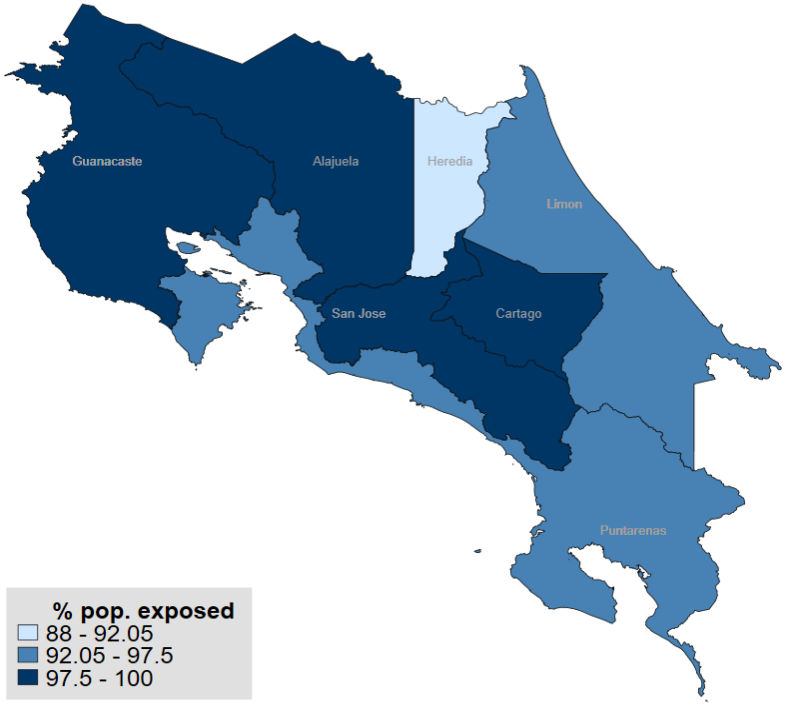
Health restrictions imposed on mobility to prevent COVID-19 infections, especially at the beginning of the pandemic, led to reduced air pollution in several sites in the GAM. For example, the concentration of nitrogen dioxide in San José dropped by 32.4% between 2018 and 2020 (MINSA et al., 2020[39]). However, these air quality improvements can be lost due to several factors: easing of vehicle restrictions with reactivation of the economy; dependence of public transport on diesel fuel; and weak vehicle inspections (CONARE, 2022[10]).

Contrary to the OECD average, the average number of premature deaths caused by $PM_{2.5}$ exposure in Costa Rica during the last decade has slightly increased. Cardiovascular diseases and chronic respiratory complications were the most common causes of death (IHME, 2022[41]). If PM_{10} concentrations were within the previous 20 µg/m^3 WHO guideline, Costa Rica would save more than USD 17 million per year in health spending linked to chronic bronchitis and generate a global welfare gain of USD 186 million (Alpízar, Piaggio and Pacay, 2017[42]). Mortality from exposure to ambient $PM_{2.5}$ reached its highest level in 2019,

with 185.8 per 1 million inhabitants (OECD, 2023[43]). Moreover, throughout 2017-20, different natural phenomena affected air quality in the country, including volcanic eruptions and dust from the Sahara. These phenomena pushed exposure beyond compliance with national regulations, aggravating the population's health risk linked to air pollution.

Figure 1.13. Concentration levels of fine particulate matter surpass WHO standards

Population exposure to more than 15 µg/m^3 of $PM_{2.5}$, 2019.



Note: The underlying $PM_{2.5}$ concentration estimates are from the Global Burden of Disease (GBD) 2019 project. They are derived by integrating satellite observations, chemical transport models and measurements from ground monitoring station networks. The concentration estimates are population-weighted using gridded population datasets from the Joint Research Centre/Global Human Settlement project. The accuracy of these exposure estimates varies considerably by location. Accuracy is poorer in areas with few monitoring stations and in areas with high concentrations. For further information: Mackie, A. et. al. (2016) (http://dx.doi.org/10.1787/5jlsqs8g1t9r-en), Van Donkelaar, A. et. al. (2016) (http://dx.doi.org/10.1021/acs.est.5b05833), Shaddick, G. et al. (2018) (http://doi.org/10.1021/acs.est.8b02864), Wang, H. et al. (2020) (https://doi.org/10.1016/S0140-6736(20)30977-6), Ghosh, R. et al. (2021) (https://doi.org/10.1371/journal.pmed.1003852).
Source: OECD (2023), "Air quality and health: Exposure to $PM_{2.5}$ fine particles - countries and regions", *OECD Environment Statistics* (database); United Nations Office for the Coordination of Humanitarian Affairs (2021), Costa Rica-Subnational Administrative Boundaries.

1.7.3. Regulations and monitoring

In 2022, the government strengthened emissions limits in place since 2011 for boilers and furnaces in all sectors. Emission limits are established for particulate matter, SO_2 and NO_x. Operators have emission reporting obligations and are inspected by the health ministry. Vehicle emission standards have been in force since 2018, but they are lenient. The entry into force of stricter Euro 6 or Tier 3 emission standards was first postponed from 2021 to 2023 and subsequently to 2027. The second postponement aimed to contain rising energy prices, as the stricter vehicle standards would entail the import of more expensive fuels (Chapter 2).[10] Two-wheelers are the main source of CO and hydrocarbons (Figure 1.11). Regular vehicle inspections (RTV) only check emissions of CO, CO_2 and hydrocarbons for petrol vehicles and opacity for diesel vehicles. However, many vehicles continue to circulate even after failing the RTV due to lax enforcement (CONARE, 2020[30]). Stricter limits on sulphur content of petrol were expected to become law in September 2022.

The Ministry of Health, with the help of experts from other institutions, co-ordinates and designs the National Air Quality Monitoring Network, as well as approving and disseminating the data gathered. The National University of Costa Rica monitors air quality, but constrained budgets and limited support from the central government have hampered the consistency and expansion of its work.

Although air quality limits are set in legislation, there is no penalty for exceeding the limits. The monitoring network is too limited to generate sufficiently frequent and consistent data on air quality and exceedances of thresholds. As of 2022, the country's network included only two automatic and continuous monitoring stations, with three more expected in 2023, all in the GAM. Several manual stations are also in place, but data are gathered only three times per week. This lack of data on air pollutants emissions and air quality, as well as the absence of continuous monitoring, is a serious concern since it restricts establishment of models, targets or baselines. The country needs to expand its air emissions monitoring network to other locations both inside and outside the GAM. The country should contemplate use of automatic sensor and satellite data when possible for more systematic and automatic information collection.

Costa Rica has developed a webpage and mobile application to help map and present continuous data on air quality (i.e. Costa Rican Air Quality Index). This puts the country on the right track to improve information diffusion, one of 11 priorities in the Latino American Intergovernmental Air Pollution Network. These tools will also serve to warn the population of possible air pollution exposure with high impact on health, as directed by the 2016 Air Quality Regulation for Air Pollutants.

1.8. Moving towards a circular economy

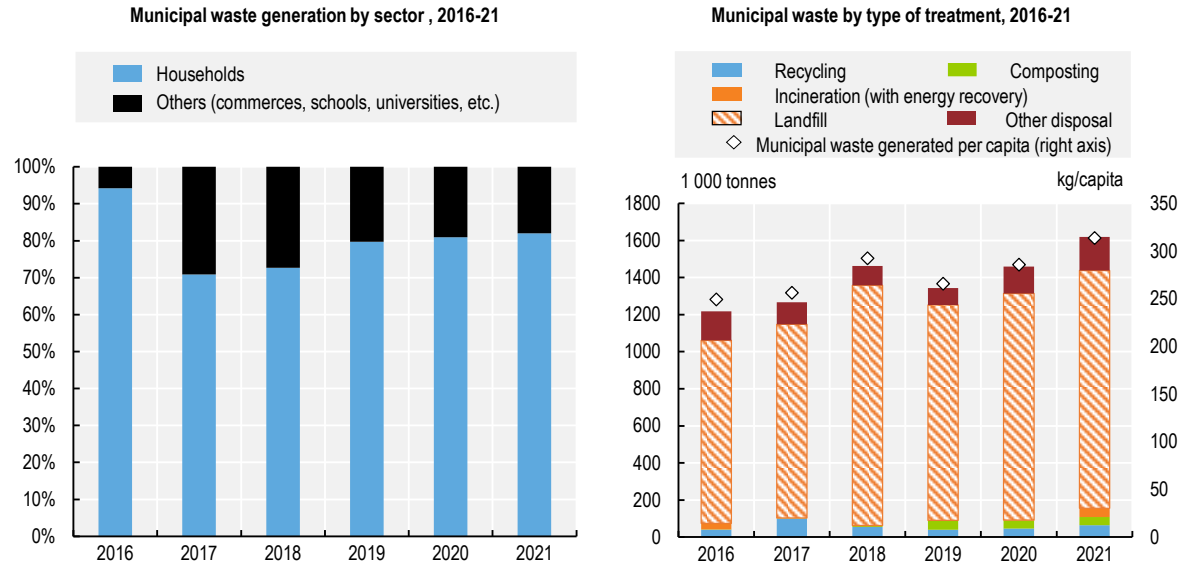
1.8.1. Waste and materials management

Material consumption, intensity and environmental footprint have increased since 2000 driven by urbanisation, and economic and population growth. However, the increase was slower than GDP growth, resulting in improved material productivity. Non-metallic mineral resources and biomass accounted for 56% and 34% of material consumption, respectively, in 2019 (BCCR, 2022[44]). This mainly took the form of construction materials from the extraction of sand and gravel, and imports of chemicals and fertilisers.

Costa Rica's municipal waste generated per capita is among the lowest in the OECD (see Basic Statistics), partly reflecting low-income levels (OECD, 2022[45]). However, the generation of municipal waste has grown. During the COVID-19 pandemic, household waste rose by 24% compared to 2019 levels due to teleworking practices (Figure 1.14). The expected increase of population and per capita income, and resulting changes in consumption patterns, are likely to result in higher waste generation.

Since 2010, trucks have collected most household waste, but nearly 10% of households still burn or bury it (INEC, 2022[46]), mainly due to low coverage in certain areas of the country. Less than half of households properly separate their organic waste, glass, paper, cardboard and aluminium (Figure 1.15). Overall, between 44-52% of biodegradable waste generated by households is adequately retrieved, with quantities varying given a household's social status and living area (CNA, 2022[47]). This is a pressing issue since between 50-60% of waste generated by households and communities in Costa Rica is biodegradable, with food waste an important component (Soto Córdoba, 2019[48]). The country has set a target to halve biodegradable waste discharged in landfills by 2050 (CNA, 2022[47]).

Figure 1.14. Households generate more than two-thirds of Costa Rica's municipal waste, which is mostly disposed of in landfills



Note: Other disposal includes waste treated/disposed of through other unspecified treatment processes, as well as process and moisture loss.
Source: Ministerio de Salud de Costa Rica; OECD (2023), "Municipal waste, generation and treatment", *OECD Environment Statistics* (database).

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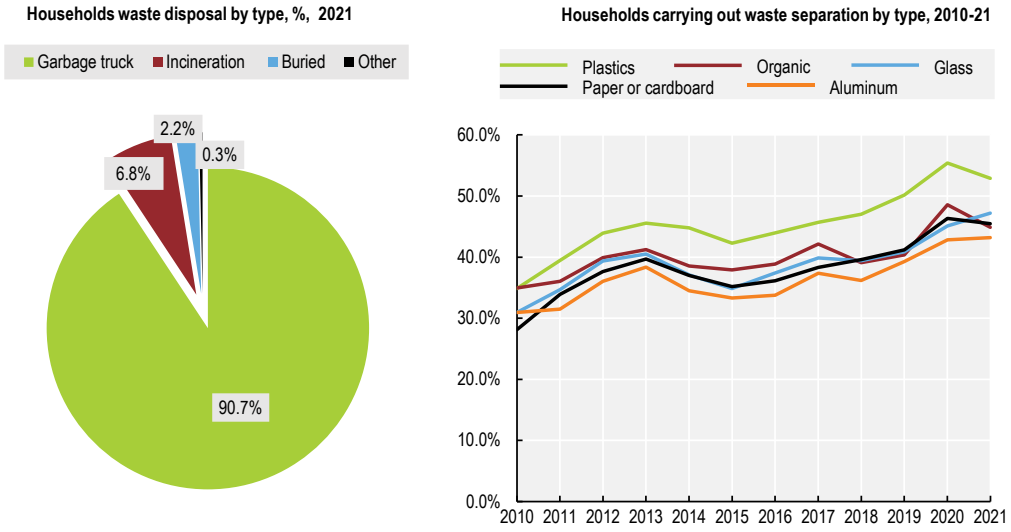
Over the past 15 years, Costa Rica has closed 48 illegal dumpsites. However, the country still relies on landfills for waste disposal, which exert pressure on ecosystems and human health. In 2021, 7 landfills and 53 dumpsites were still open, receiving nearly 80% of the total waste generated (Figure 1.14). This is one of the highest shares of landfilled waste in the OECD (Figure 5 in Assessment and Recommendations). Waste disposal in inappropriate sites remains considerable, predominantly in rural regions such as Brunca (Soto Córdoba, 2019[48]). Additionally, according to the First Situation Report of the Costa Rican Solid Waste NAMA (Box 1.3), around 361 000 tonnes (t) of waste are not adequately managed. Estimating the amount of improperly disposed waste in the country is also challenging. Thus, it is difficult to know how much waste could be washed into sewers or end up in rivers, wetlands and/or oceans (MINAE, 2021[49]).

Costa Rica has set extended producer responsibility schemes for 14 types of products.[11] However, they do not cover major waste streams (e.g. construction waste, packaging) and lack compulsory recovery (Soto Córdoba, 2019[48]; Abarca-Guerrero et al., 2022[50]). Costa Rica has also started to using construction and demolition waste as a base for roads. Around a third of the waste produced in Costa Rica is recoverable (Soto Córdoba, 2019[48]). Recovery rates have increased since 2016 but remain among the lowest in the OECD (OECD, 2022[45]). In 2021, only 7% of total waste generated was recovered, with recycling and composting representing 4% and 3%, respectively (Figure 1.14). Thus, Costa Rica failed to meet its 15% waste recovery target set in the 2016-21 National Strategy for Waste Separation, Recovery and Valorisation (ENSRVR) (MINSA, 2016[51]; OECD, 2022[45]). Only metals and plastics are recovered and exported, mainly to Asia, Europe and the United States (BCCR, 2022[44]).

Figure 1.15. Most households rely on garbage trucks, even as waste separation gains in popularity



Note: Each household can separate waste differently. "Other" includes waste disposal in vacant lots, rivers, streams and the sea.
Source: INEC (2021), *Encuesta Nacional de Hogares*; INEC (2022), "Prácticas mediambientales en los hogares", *Estadísticas Ambientales*.

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Box 1.3. Solid Waste NAMA, a tool to enhance climate mitigation

In 2019, the solid waste sector in Costa Rica emitted around 1 329 $ktCO_2e$ (Soto Córdoba, 2019[48]), including emissions from landfills, transport and recycling. To achieve its net-zero objective by 2050, Costa Rica formulated a Nationally Appropriate Mitigation Action (NAMA) for the solid waste sector. This engaged the Ministry of Health, the Climate Change Directorate of the Ministry of Environment and Energy (MINAE), the Deutsche Gesellshaft für Internationale Zusammenarbeit (GIZ), and other key stakeholders such as the Institute for Municipal Development and Advisory, the Union of Local Governments and the Chamber of Industries.

The NAMA sets a mitigation target of 480 $ktCO_2e$ per year on average through the active capture of gases (especially methane) generated in landfills and their possible use for electricity generation. It fosters treatment of organic waste for biogas generation and waste segregation at source to increase the number of dry materials (e.g. plastics, paper/cardboard, metals and glass) recovered for recycling. Moreover, it seeks to enhance efforts for a better integrated waste management, improve environmental education to promote use of family and farm composting, and facilitate implementation of advanced technologies.

Source: Soto Córdoba (2019). DCC (2019), *NAMA Residuos Sólidos*, NAMA-Residuos-Solidos.pdf (cambioclimatico.go.cr) / (accessed 1 December 2023).

Despite higher awareness of plastic pollution, around 40 150 tonnes of plastic in Costa Rica still end up in natural environments each year, putting biodiversity at risk (UNDP and University of Costa Rica, 2019[52]). On average, about 15 truckloads of plastics are dumped into the sea each year (CNA, 2022[47]), affecting fishing, marine transport, tourism and livelihoods in coastal areas. The 2021 "Law to Combat Plastic Pollution and Protect the Environment" prohibits state institutions from using single-use plastics, requires all plastic packaging to be recyclable by 2030, bans the marketing and free distribution of single-use plastic (e.g. plastic straws, plastic bags), and requires differentiated containers for reusable and non-reusable

plastic waste in all businesses that sell single-use plastic products. In addition, a ban on polystyrene cups and plates is in place. Enforcement of these regulations will be key to improve waste recovery and endorse behavioural changes. Work is under way in Costa Rica to align its national policies with international plastic pollution initiatives.

A mix of financial, institutional and socio-cultural factors limit recycling and recovery of waste (Table 1.1). The country would highly benefit from a more selective waste collection and better awareness and communication on waste separation at source. Incentives for the use of recovered and recycled materials as inputs into production processes are needed to develop a domestic market. An integrated and publicly accessible digital platform is needed to provide data on waste collection and treatment, as well as quantities of materials disposed and viable for recycling.

Table 1.1. Barriers for waste recycling and recovery

Financial	Institutional	Socio-cultural	Technological
Low international prices of recycled materials, not covering operation and investment costs.	Excessive requirement for permits, as well as complex and slow registration processes.	Poor separation of recyclable materials in households.	No technical support from knowledge organisations for the transformation of materials.
Limited market; a few companies determine local prices and buy materials.	No government support for procurement of products with recycled material.	Little recognition of informal waste pickers and their work by municipalities, businesses and citizens.	Companies lack knowledge on modern machinery and technologies to improve and increase production processes.
High direct costs: taxes, social charges, electricity prices, high transportation costs.	Lack of support to the recycling sector from decision makers.	Different stakeholders in the recycling value chain do not understand each other's needs.	Workers at recycling-related business are low skilled.
Recycling sector has difficulties accessing credit due to guarantees needed; equipment is not allowed as collateral; high interest rates.	Unfair competition from non-formal companies, which operate with lower costs.	Lack of recognition of the good initiatives and investments in the solid waste sector.	There are no detailed statistics on waste collection by sector, available materials, real savings or ecological footprint related to recycling.
Lack of measures to consider waste pickers when the landfills are closed.	Formal companies can no longer buy material from informal waste pickers.		Materials cannot be transformed in the country.
High costs and complicated processes to formalise waste pickers and recycling-related businesses.	Most municipalities do not collect waste separately so most of it ends in landfills.		
Important investments needed in waste infrastructure and equipment.			

Source: (Abarca-Guerrero et al., 2022[50]).

1.8.2. Governance and strategies for waste management

Costa Rica has been implementing key actions and strategies to improve its waste management since the enactment of the 2010 Law on Integrated Waste Management and its accompanying regulations. These include the ENSRVR, the 2019-25 Integrated Waste Management Plan, the 2021-30 Marine Litter National Plan and the 2020-50 National Composting Plan. At the time of writing, the government was updating the National Integrated Waste Management Plan.

Despite the legal requirement of establishing an integrated waste management plan for areas in which they have stewardship, 15 of 82 local governments do not have such a plan. Moreover, nearly 30% of municipalities do not have a regulation for waste collection, deposit and treatment services (CGR, 2021[53]). Local governments are also required to guarantee selective, accessible, regular and efficient waste collection services for all inhabitants in their territory. Yet most municipalities in border areas, as well as

those in the province of Limón, have collection rates below 40%. For the 24 municipalities offering separate waste collection services, coverage is limited to 20% of resident households (CGR, 2021[53]).

Local governments face high operating costs that are not reflected in waste collection tariff models. In 70% of municipalities, the fees are outdated, and 25% are in deficit (CGR, 2021[53]). Therefore, the Municipal Code encourages municipalities to periodically review their waste collection tariff models and cost structures. In addition, compliance by municipalities with the Integrated Waste Management Legislation is poor (Soto Córdoba, 2019[48]). Local governments will need further technical and financial resources to promote initiatives around waste separation, recycling, composting and re-use. Co-ordination with both the central government and private sector should be strengthened. This will help build capacity in municipalities to provide better quality public services.

More than 90% of municipalities have developed strategies to motivate citizens to sort waste more effectively, while encouraging selective waste collection, cleanliness of public spaces and integrated waste management (CGR, 2021[53]). Municipalities in Costa Rica could improve waste service delivery and encourage job creation by integrating informal waste pickers and public-private initiatives such as *Ecoins* (Box 1.4) into their waste management plans. The 2016-2021 ENSRVR did include informal waste pickers as key actors, but Costa Rica still needs to strengthen its support to them. This should include improving job conditions and raising awareness in the public and private sector, as well as among the population, of their value.

Box 1.4. Ecoins, a public-private partnership to encourage recycling

What is it?

Ecoins is a digital purchasing power parity in Costa Rica that rewards recycling and encourages households to change consumption habits. It was established through a public-private partnership between the Ministry of Health and sponsoring companies. In 2019, the online platform counted 46 000 members and more than 250 recovery centres and recovered 14 million units of materials. Apart from benefiting households, this initiative offers a win-win for other key stakeholders. Collection centres, for example, benefit from a productivity and profit increase with improved selective waste separation and a higher volume of recoverable waste in good condition. Manufacturers can showcase their sustainable offer of goods and services, while improving their product life cycle. Meanwhile, municipalities receive support to ensure more sustainable waste management, fewer landfill costs, and more green businesses and jobs in their cantons.

How does it work?

Individuals subscribe to an online platform to deposit their waste at the closest collection centre. Waste must be cleaned and separated into plastic (PET bottles and HDPE gallons), glass, Tetra Pak, tinplate (tuna or sardine cans) or aluminium. A value is then attributed to the type of waste collected based on the market rate for recycled materials. Users then benefit from an amount of *Ecoins*, exchangeable for discount coupons for sustainable products and experiences.

Note: The materials collected include aluminium, plastics, glass, paper and cardboard, oils, tyres, electronics, organics, inks, toners and expired medicines.
Source: Ecoins (2022), Preguntas frecuentes, Ecoins, San José, https://ecoins.eco/preguntas-frecuentes/ (accessed 9 January 2023); Ministry of Health (2018), Costa Rica estrena moneda: los Ecolones, Ministry of Health, San José. Se presenta gran alianza público-privada como herramienta para cumplir la Ley 8839 de gestión de residuos sólidos - Costa Rica estrena moneda: los ecolones (ministeriodesalud.go.cr) (accessed 9 January 2023); Soto (2019).

Costa Rica has launched education campaigns on waste sorting and recycling in schools. This is a step in the right direction, but broader and more regular education, training and awareness-raising campaigns are needed to encourage households and businesses to change behaviours. In the case of recoverable and organic waste, municipalities need to encourage small and medium-scale separation and treatment systems by and for citizens. Moreover, they can create incentives to reward households that reduce their organic waste and embrace responsible practices such as composting. Promoting the generation of compost from the significant share of organic waste produced by households and the re-use of recoverable waste will add value. Moreover, it will help fill the gap of sound waste collection infrastructure and services, while reducing pressures on landfills and GHGs emitted by the sector.

1.8.3. Strategies and actions for a circular economy

With the ongoing work on the National Circular Economy Strategy, Costa Rica aims to facilitate the transition to a circular economy and enable climate mitigation and resilience in the productive chain. The strategy has a special focus on activities linked to industrial production, agri-food systems, tourism and construction, given their environmental impact. An inter-sectoral and multi-stakeholder Technical Committee of Circular Economy (CITEC) was established to oversee policy alignment with the circular economy principles. Improving waste management and circularity is among the pillar of Costa Rica's strategy to reach net zero by 2050. The PND 2018-50 foresees the implementation of a NAMA on waste (Box 1.3).

At MINAE's request, the Tropical Agricultural Research and Higher Education Center (CATIE) developed step-by-step guidelines to facilitate the transition to a circular economy for local governments. In 2022, more than 40 municipalities were trained on the matter. The Institute of Technical Standards of Costa Rica developed a technical standard (INTE G106:2020) to guide implementation of the circular economy principles in organisations.

Focus on agri-food systems

Costa Rica has been implementing measures to improve agricultural waste management and organic waste recovery, although more efforts are needed. Nearly half of farms still do not treat their solid waste in any way (Suárez-Espinoza, 2022[54]). The National Bioeconomy Strategy 2020-30 incorporates the issue of agricultural waste through the axes of sustainable rural development and better environmental management in the processes and creation of value networks. With the seventh National Energy Plan 2015-30, Costa Rica also seeks to promote residual biomass from agriculture, forestry and fishing processes as a source of energy. The country would benefit from scaling up an education campaign on organic agricultural waste to farmers, producers and technicians, and promoting projects on its use in the industrial and food sector (Suárez-Espinoza, 2022[54]).

1.9. Managing water resources and water supply and sanitation services

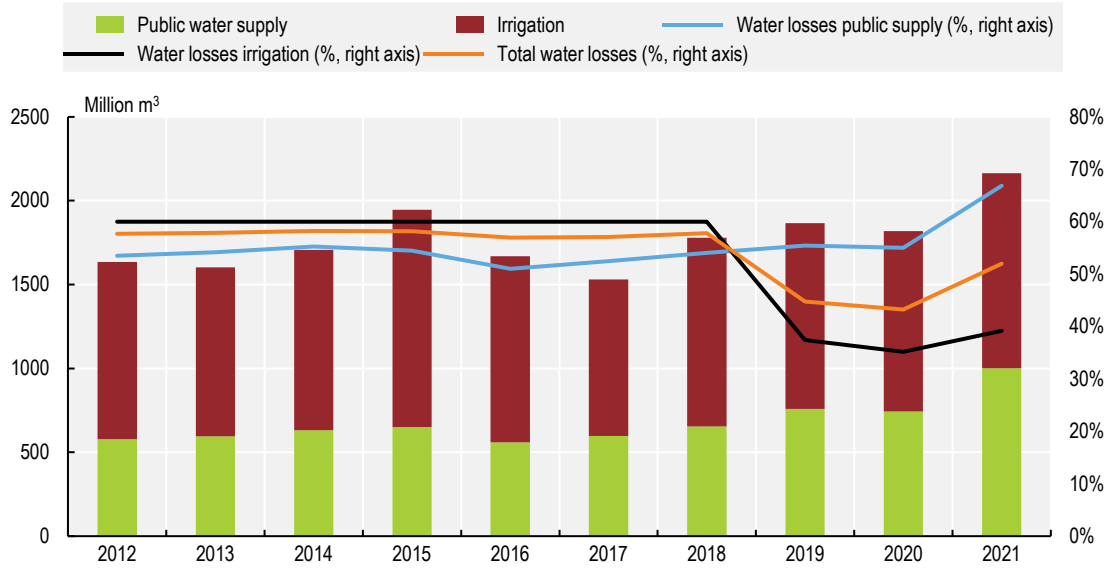
1.9.1. Water quantity and quality

Costa Rica has abundant freshwater resources as measured by renewable freshwater resources per capita.[12] Though freshwater withdrawals steadily increased over 2010-20, abstractions as a share of total renewable resources remain below the threshold for water stress (see Basic Statistics).[13] Hydropower accounts for the largest share of freshwater abstractions (mainly non-consumptive use), with agriculture the second largest user. Despite abundant freshwater resources, high levels of losses from public water supply and irrigation networks are problematic. Water losses as a share of total withdrawals for irrigation declined sharply in 2018, with a slight increase from 2020 to 2021, reaching nearly 40% in 2021. Meanwhile, losses in public water supply remained relatively high over the period, rising to just over 65%

in 2021 (Figure 1.16). This underscores the need for renewal and upgrading of ageing infrastructure. The Non-Revenue Water Reduction and Energy Efficiency Optimisation Project diagnosed challenges related to water losses and developed an action plan to address them.

Figure 1.16. Water losses remain high, especially from the public water supply network

Freshwater withdrawal for distribution and losses by activity, 2010-21.



Source: CTIE-Agua (2023), Estadísticas e Indicadores Claves para la Gestión Integrada de Recurso Hídrico, Comité Técnico Interinstitucional de Estadísticas del Agua.

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Water pollution and deterioration of water quality in rivers are among the major environmental challenges in Costa Rica (CONARE, 2022[10]). The 2013 Water Agenda of Costa Rica highlighted these are also among the main environment-related concerns voiced by the public, as shown by the significant share of legal complaints to the Administrative Environmental Tribunal related to negative impacts on water bodies (MINAE, 2013[55]). A pilot programme to monitor water quality was conducted in 2015-20. Its results informed the update of the National Plan for Monitoring the Quality of Surface Water Bodies. However, monitoring remains at early stages and is not sufficient to provide an accurate and comprehensive understanding of the state and evolution of water quality. Although most river basins are monitored, many water bodies only have a few monitoring sites. Further, data are not collected consistently across monitoring sites and pollution parameters at regular intervals. This hinders establishment of a robust baseline on water quality and understanding of changes over time. More comprehensive and robust water quality monitoring is needed.

MINAE and the Ministry of Health share responsibility for monitoring and enforcement of wastewater discharges. The Water Directorate of MINAE carries out inspections and reports violations to the Ministry of Health, which can request a corrective action plan. In cases of non-compliance, the Water Directorate does not have authority to impose sanctions or fines, but it can increase the environmental fee for discharges. Enforcement of violations of wastewater discharge standards should be strengthened with increased sanctions for non-compliance.

1.9.2. Water policy framework and governance

Costa Rica has a number of strategies, plans and policy frameworks related to water, though many are outdated. The National Plan for Integrated Water Resources Management of 2008, the National Water Policy of 2009 and the 2013 Costa Rica Water Agenda set out the main strategic goals and frameworks for water management.[14] Despite lacking an updated Water Law, which dates from 1942, the country has made progress to establish policies and governance arrangements to support water management (GWP, 2020[56]). The move to update the water strategy is a welcome development to ensure it is fit for purpose to address current and future challenges, including a focus on improving water quality and enhancing resilience to climate change. The new water policy framework and implementation of river basin planning should reflect the results of extensive consultations with stakeholders and indigenous communities.

Costa Rica has made progress on water governance with the establishment of regional stakeholder forums and river basin planning. The National Water Governance Mechanism was established in 2018 to provide a platform for dialogue with civil society and public institutions. As in many other countries, a large range of actors at multiple scales is responsible for water management, creating overlap and duplication. Reviewing the institutional arrangements to clarify roles and responsibilities and streamlining co-ordination mechanisms can support more effective and efficient water management.

Costa Rica made important strides in strengthening the allocation regime to manage water abstractions. Water abstractions are managed through concessions, which are granted for a specific use and maximum volume in a given period. Concessions may be granted for up to 30 years, with the expectation of periodic renewal. If a concession is not used during the period, it will be lost – a “use it or lose it” approach. Trading, leasing and transferring of concessions is not allowed. If there is a need to curtail water withdrawals (e.g. due to periodic water shortage), there is a pre-defined order of priority uses: domestic, energy production, industry and, finally, agriculture (OECD, 2015[57]).

To better account for environmental needs in water allocation decisions, a methodology was formalised in December 2021 to define ecological flow requirements and assess the impact of water concessions granted. Establishing mechanisms to allow MINAE to adjust water volume in concessions is also important to improve flexibility of water allocation arrangements and adjust to changing conditions, including increased variability due to climate change (OECD, 2015[58]). To that end, the development of a climate change indicator to inform adjustment of concessions was a promising step. MINAE is piloting the indicator in the Tempisque River, where abstractions are monitored monthly during the dry season due to the very low flows that can occur and resulting conflicts related to water use.

A regional control programme that monitors water abstractions has received additional human resources. Nevertheless, the Water Directorate received more than 120 complaints in 2021 and 2022 related to illegal water abstraction, pollution and illegal construction affecting water bodies, among others (Dirección De Agua, 2022[59]). Regarding monitoring of water abstractions, inspections are mainly random or in response to complaints to the Water Directorate.

1.9.3. Economic instruments for water management

Costa Rica has several economic instruments to manage the quantity and quality of water. For water use, the Water Utilisation Levy (CAA) manages water use and raises revenue for the sustainable management of water resources.[15] All users abstracting water from surface water or groundwater bodies must have a concession and pay the corresponding levy. The amount of the CAA should, in principle, reflect the value of use and the environmental service provided by the water resources. Amounts levied are differentiated by the type of use and type of source.[16] The amount of the levy is higher for commercial, industrial and tourism uses; followed by agri-business and household uses, with the smallest amounts levied for aquaculture and hydropower. Overall, the amounts levied by the CAA are very low (in 2022, the highest

rate was CRC 3.95, equivalent to USD 0.007 per m^3 of water). It raises only negligible amounts of revenue, limiting their use as an economic incentive for water use and their contribution to raising revenue for sustainable water management.

The Water Discharge Levy (CAV) applies the polluter-pays principle with a fee on wastewater discharge, based on pollutant loads discharged. The parameters considered are Chemical Oxygen Demand and Total Suspended Solids.[17] The law allows MINAE to extend the CAV to cover other pollution parameters but only after consulting stakeholders and with technical and scientific justification. The CAV is complemented by the 2007 Regulations for discharge and re-use of wastewater. These charge a differentiated amount depending on whether discharges are above or below the value of the allowed parameter. Funds are earmarked for purposes established by law.[18] Coverage of the pollutants under the CAV could be broadened to apply the polluter-pays principle more fully.

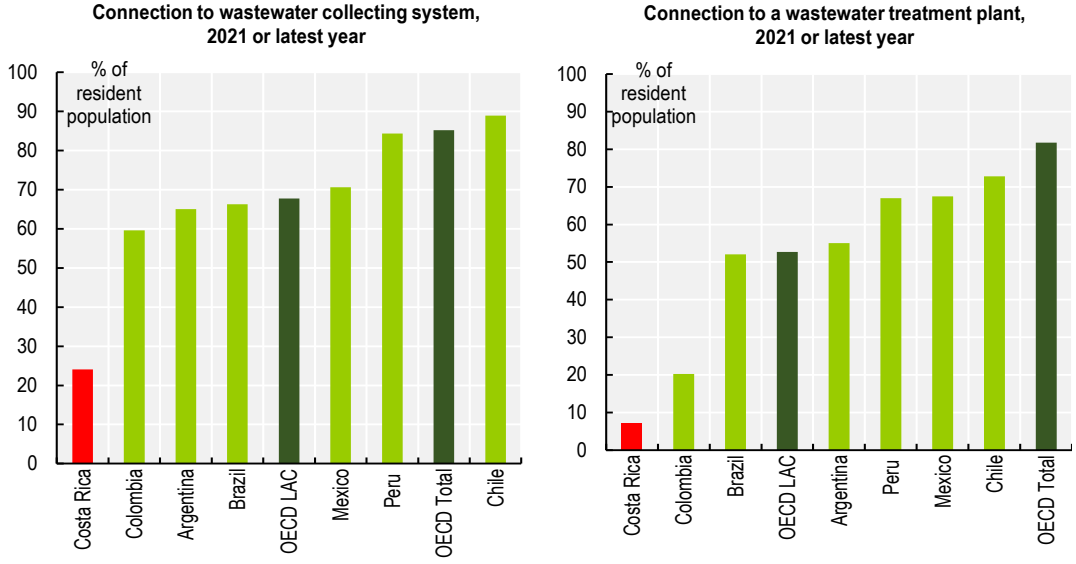
1.9.4. Water supply and sanitation services

There is an urgent need to scale up investment to expand water and sanitation services and wastewater treatment. In 2020, about 80% of the population benefited from access to safely managed drinking water,[19] but progress to increase access has stagnated. Access to safely managed sanitation has deteriorated from 35% in 2010 to 30% in 2020 (UNICEF, 2023[60]). Costa Rica lags considerably behind OECD averages and other countries in the region for the share of population with access to safely managed sanitation (Figure 6 in Assessment and Recommendations). The country also faces challenges to identify vulnerable populations, including the elderly, populations with specific health needs and Indigenous Peoples, among others, which require access to drinking water and sanitation (Government of Costa Rica, 2019[61]).

The lack of wastewater treatment is also a major issue, with implications for public health and water quality. A large share of wastewater from homes and industries flows into rivers without treatment. Only about a quarter of Costa Rica's population is connected to a public sewerage network, a low share compared to OECD countries and others in the region (Figure 1.17). The majority of population has independent wastewater treatment (septic tank), while less than 10% are connected to a public wastewater treatment plant (Figure 1.17). Septic tanks usually only capture a small share of wastewater from households (mainly sewage), while the remaining wastewater is disposed in water bodies untreated. Further, the construction, operation and maintenance of septic tanks are not supervised (MINAE, 2013[55]). Unless carefully managed and monitored, septic tanks can leak into the soil and groundwater, resulting in contamination. Only about 15.5% of the sewage collected receives some type of treatment (CONARE, 2022[10]).

The Costa Rican Institute of Aqueducts and Sewers (AyA) plans and delivers drinking water and sanitation services, and manages stormwater drainage. AyA can delegate responsibility for water provision and administration in smaller communities and rural areas to community water associations. The financing of WSS services is based on the tariff system regulated by the Public Services Regulatory Authority (ARESEP). WSS tariffs do not reflect the full economic cost of service provision; significant cross-subsidies among users exist. Last year, ARESEP approved a temporary reduction in rates for water supply and sewerage services. Users of the National Irrigation and Drainage Services also benefited from a temporary rate reduction. Tariff levels should better reflect the costs of service provision and be based on long-term strategic investment plans. Targeted programmes to address affordability issues should be strengthened. A National Program of Subsidies for Drinking Water and Related Services[20] promoted by AyA allows access to funds to provide drinking water services to families in conditions of both basic and extreme poverty (Government of Costa Rica, 2019[61]). Nevertheless, identifying and targeting those who could benefit remains challenging.

Figure 1.17. Wastewater treatment lags severely behind other countries in the region and the OECD



Note: OECD average excludes Iceland in the right panel and New Zealand in the left panel. OECD LAC average includes Latin American countries that are OECD members (Chile, Colombia, Costa Rica and Mexico) and candidate countries for accession (Argentina, Brazil and Peru). Argentina: data are estimates for urban areas only. Colombia: data is estimated for urban centres. Mexico: data is estimated based on treated wastewater; data for total connection to wastewater collecting system date back to 2010.
Source: OECD (2023), "Water", *Environment Statistics* (database); WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (2021).

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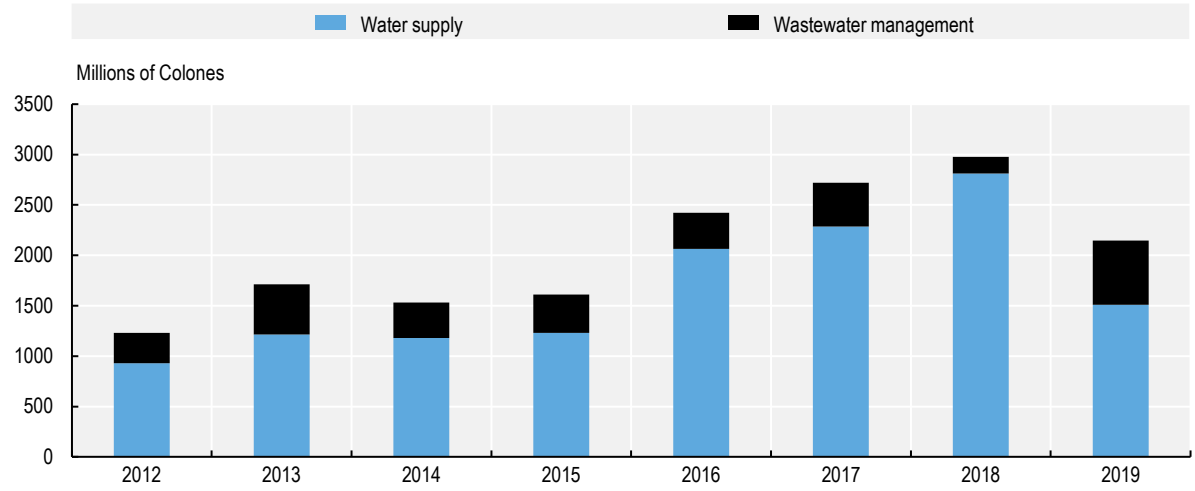
Costa Rica has a dedicated programme to scale up investment in sanitation and wastewater treatment. However, the pace and scale of investment are not commensurate with the investment needed to reach the target of universal coverage. The 2016 National Wastewater Sanitation Policy (PNSAR) set an objective to achieve, by 2045, the safe management of all wastewater generated in the country. Recently, a new treatment plant (Los Tajos) was commissioned to serve a large part of the wastewater generated in the GAM of San José (OECD, 2023[3]). However, under business as usual, only about 15% of the population will be connected to public wastewater treatment systems by 2045, far from the 100% target in the PNSAR. If plans are executed, coverage is estimated to reach 38% (CONARE, 2021[32]). Over 2012-19, most investment in water and sanitation was allocated to water supply, with a smaller share for wastewater treatment (Figure 1.18). The Comptroller General has raised concerns regarding delays and cost overruns in the construction of the metropolitan sewerage system. It has highlighted that investment to date to improve sewerage and wastewater sanitation is only a fraction of requirements (Bnamericas, 2021[62]).

A significant share of investment in public works relies on public funding and loans from development partners. Cost recovery from WSS tariffs and revenue raised by the CAA and CAV are limited. The country could benefit from long-term strategic financial planning for water infrastructure investment. This could include exploring a broader range of options to mobilise additional finance (such as public-private partnerships, use of proceeds bonds and guarantees, among others) (OECD, 2022[63]). Costa Rica already has experience with green bonds (see Chapter 2), including for water investments. In 2021, ICE was the first hydropower operator issued a green bond aligned with sustainable hydropower criteria of the Climate Bonds Initiative. The revenue raised was used to refinance debt incurred to build the Reventazón Hydropower Plant (IHA, 2021[64]).

Figure 1.18. Investment has been allocated largely to water supply, with a smaller share for wastewater treatment

Government gross capital formation for water supply and sanitation, 2012-19.



Note: Data prior to 2016 are based on the methodology used before the benchmark revision in 2019.
Source: OECD (2023), "Government expenditure by function (COFOG)", *National Accounts* (database).

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Costa Rica also has a dedicated water fund to raise and disperse funding to support the protection and conservation of water resources in the sub-basins of the Grande River and Virilla River. The fund, Agua Tica, provides a collective vehicle to pool funding and technical capacity from various sources, including public institutions, private companies and civil society. It is based on a trust model. Funding is dispersed to projects that support the protection of the watershed, guided by scientific research (Agua Tica, 2022[65]).

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Notes

[1] The Greater Metropolitan Area comprises the four largest cities (San José, Alajuela, Cartago and Heredia).

[2] The areas most affected by extreme flooding are Guanacaste and the provinces of Alajuela, Heredia and Limón (ECLAC, 2018[12]).

[3] The other countries are Chile, Colombia, Guatemala, Mexico and Uruguay.

[4] The cycles of the El Niño phenomenon (dry years) have windier conditions; in La Niña cycles (rainy years) there is less wind but more hydroelectric generation. The wind pattern in Costa Rica is stronger during the summer than in winter.

[5] The dry pulpy fibrous material that remains after crushing sugarcane stalks to extract their juice.

[6] Costa Rican companies should own at least 35% of the capital of power generating companies.

[7] Vehicles with the licence plate ending in 1 or 2 cannot enter the area within the San José ring road on Monday; those with licence plates ending in 3 or 4 cannot circulate on Tuesday, and so on. If a household owns two or more vehicles under restriction on the same day, they can transfer the restriction to the following day for one of the vehicles.

[8] The costs of air pollution and GHG emissions due to transport were estimated at USD 152 million and USD 17 million, respectively.

[9] Results are from established monitoring sites and do not necessarily measure concentrations that are maintained or persistent in other parts of the GAM or the country.

[10] For comparison, Euro 6 standards have been in force in the European Union since 2014 and Tier 3 standards have been in force in the United States since 2017.

[11] These include used tyres, lead acid batteries, watch batteries and other batteries, air conditioners, refrigerators, refrigeration transport and industrial refrigeration equipment, used lubricating oil, plastic containers to contain lubricating oils, metal containers, plastic and glass to contain agrochemicals, electrical and electronic appliances, fluorescent and compact light bulbs, refrigerants, mattresses, polystyrene, motor vehicles and special equipment.

[12] In Costa Rica, there are 34 hydrological basins and 59 known aquifers (OECD, 2015[57]).

[13] Water stress is measured as water abstractions as a share of total renewable resources. Under 10% is considered as no water stress (OECD, 2012[66]).

[14] The 2013 Water Agenda set out six strategic goals expected to be achieved by 2030: i) clean rivers and protected aquifers; ii) improving the governance of water resources; iii) efficient and equitable use for all uses; iv) investment for water infrastructure; iv) a new culture of water: restructuring current practices, habits, valuation and perceptions about water resources in the country; and v) information for decision making.

[15] Revenue raised by the CAA is allocated as follows: 25% to the National System of Conservation Areas to carry out projects for the protection of water resources; 25% to the Fondo Nacional de Financiamiento Forestal (FONAFIFO) to finance payment for ecosystem services programmes on private land; 5% to the Commission for the Regulation and Management of the Reventazón River Basin (COMCURE); and 45% to the Water Directorate for projects to manage water resources.

[16] CAA 2022 amounts available at this link https://da.go.cr/wp-content/uploads/2017/07/CAA-importes-por-usos-2022.pdf.

[17] The amounts established for collection are: CRC 127.34 for each kilogramme of COD discharged; CRC 109.98 for each kilogramme of TSS discharged. The amount for each pollution parameter is adjusted annually to reflect inflation.

[18] Over 60% of the revenue raised by the CAV goes to fund sanitation and wastewater treatment projects.

[19] As defined by the target 6.1.1. under SDG 6 on clean water and sanitation.

[20] Executive Decree N.39,757-MINAE of 2016 and N.40,711-MINAE of 2017.

Chapter 2. Towards a green and inclusive growth

Sustainable development and green growth are high on Costa Rica's agenda. The country has a long-standing environmental policy, a comprehensive legal framework and well-developed mechanisms of environmental democracy. However, institutional capacity and financial resource constraints have hampered effective implementation. The sheer scale of investment needed to achieve the Sustainable Development Goals calls for improving the efficiency of public spending, mobilising private finance, strictly enforcing regulations and providing adequate incentives. This chapter assesses the environmental effectiveness and economic efficiency of the environmental governance and policy mix, including regulatory, fiscal and economic instruments. It also looks at efforts to increase investment in environment-related infrastructure and services and encourage green business practices.

2.1. Introduction

Costa Rica is the oldest democracy in Central America whose solid institutions have ensured stability over the years. The country has shown continued commitment to aligning its legislation, policies and practices with OECD standards. The Sustainable Development Goals (SDGs) are high on Costa Rica's political agenda. However, despite an extensive suite of policies addressing the SDGs, it needs to further strengthen policy coherence to achieve them cost effectively by 2030.

Costa Rica is a middle-income and open economy that has made considerable economic, social and environmental progress in the last 20 years. However, additional effort is required to pursue many of the environment-related SDGs (Chapter 1). The scale of the investment needed is remarkable, while the government is facing severe fiscal constraints that are expected to persist. With a high public debt, maintaining fiscal prudence is critical for macroeconomic sustainability (OECD, 2023[1]). It is, therefore, essential to improve the quality and efficiency of public management and spending, as well as to mobilise private finance for investment in basic infrastructure, environmental protection, climate change mitigation and resilience. There is also a need to further encourage households and businesses to make sustainable consumption and production choices. To that end, Costa Rica should promote compliance with environmental regulations, provide stronger price signals and remove harmful subsidies, while supporting vulnerable groups in getting out of poverty and informal jobs.

2.2. Ensuring sound governance for sustainable development

2.2.1. Strategic framework for achieving the SDGs

Costa Rica is strongly committed to meeting the 17 SDGs. In 2016, representatives of the parliament, government and judiciary, local governments and various social stakeholders signed the "Social Pact for the Implementation of the SDGs", the first such agreement in the world. In 2020, the government submitted its second SDG voluntary national review to the United Nations (UN) High-level Political Forum on Sustainable Development. The government has actively used the SDGs as guidelines for its main national policies, including public investment plans (Section 2.6). Its strategy prioritises SDGs related to poverty and inequality, sustainable production and consumption, and resilient infrastructure and sustainable communities; these are considered instrumental to achieve all other goals.

Costa Rica has adopted a wide range of strategic policies and plans, which are broadly aligned with the SDGs. Among the key documents are the National Decarbonisation Plan (PND) 2018-50, the National Climate Change Adaptation Policy 2020-30, the National Policy for Sustainable Production and Consumption 2018-30 and the National Biodiversity Strategy 2016-25 (Chapters 1 and 3). The National Development and Public Investment Plan (PNDIP) 2023-26 is the second multiannual investment plan to link investment projects to the SDGs they contribute to achieve. The government regards the PNDIP as a key instrument to achieve the SDGs. Several other sectoral and cross-sectoral strategies and programmes have been adopted over the years. However, many policy goals and objectives do not translate into concrete measures and adequate financing (CONARE, 2022[2]).

Progress has been made towards all SDGs. However, Costa Rica has achieved only 17 of 112 SDG-related targets, most of them linked to the coverage of basic needs and adoption of policy tools and frameworks recommended by UN Agenda 2030. It is expected to meet seven additional targets by 2030, mostly related to health (OECD, 2022[3]). It has nearly achieved SDG 7 (Affordable and clean energy), especially regarding access to electricity and share of renewable energy. However, further efforts are needed to achieve most of the SDGs related to waste, water, oceans, terrestrial biodiversity and climate, as well as to reduce informality in the job market, and tackle poverty and inequality (Chapters 1 and 3).

2.2.2. Institutional framework

The institutional framework for environmental management and sustainable development is complex. As in many countries, several ministries share responsibilities for sustainable development and environmental policies. The Ministry of Environment and Energy (MINAE) is the main government entity in charge of environmental matters. Other ministries with environmental responsibilities include health (MINSA), agriculture and livestock (MAG), and public works and transport (MOPT). MINAE, its subsidiary bodies and other institutions with environmental competences, form the Environment and Energy Sector (Box 2.1). There are also autonomous institutions with environment-related competencies that lie outside the Environment and Energy Sector.[1] Overall, environmental governance comprises over 35 subsidiary bodies of different government ministries and other decentralised institutions, with varying degrees of autonomy and with limited steering and accountability mechanisms. This is a common feature of Costa Rica's public administration (OECD, 2021[4]).

The environmental legislation establishes several inter-ministerial bodies to ensure co-ordination at the political, technical and operational levels. These include the National Environmental Council, chaired by the President of the Republic and comprising the MINAE minister and several other ministers.[2] The Sectoral Council on Environment and Energy co-ordinates activities of the institutions within the Environment and Energy Sector (Box 2.1). Several entities were created to promote environmental considerations in sectoral policies, such as the Commission on Sustainable Production and Consumption, the Technical Inter-ministerial Committee on Climate Change and the Technical Commission on the Circular Economy.

In addition, a governance system is in place for implementation of the 17 SDGs. The President of the Republic chairs the High-Level Council for the SDGs, which oversees the design, funding and implementation of the policies to fulfil the goals. The High-Level Council also comprises the MINAE minister, the ministers responsible for economic planning and foreign affairs, and the Chief Executive of the Joint Social Welfare Institute. Its composition and functions partly coincide with those of the National Environmental Council. The Technical Secretariat for the SDGs, within the Ministry of National Planning and Economic Policy (MIDEPLAN), is tasked with day-to-day co-ordination of the SDGs across line ministries. The National Institute of Statistics and Census manages the system of indicators to monitor progress towards the SDGs.

As repeatedly noted by the Office of the Comptroller General, the multitude of subsidiary bodies, decentralised institutions and inter-institutional councils and committees generates overlap and fragmentation, while dispersing spending. This hinders policy coherence and implementation effectiveness (CGR, 2022[5]). Costa Rica launched some reforms to address institutional fragmentation. These include a 2022 legislative proposal to consolidate MINAE and reduce the number of its subsidiary bodies. The country could build on this proposal to redesign and merge environmental institutions (subsidiary and autonomous entities), as well as to streamline activities of the various councils and committees engaged in horizontal co-ordination and multi-level governance. This rationalisation should be based on transparent criteria for maintaining or establishing institutional entities, a clear definition of their responsibilities and mechanisms to monitor their performance.

2.2.3. Multi-level governance

MIDEPLAN oversees implementation of national policies at the local level, including policies relevant to the environment. Costa Rica is divided into 90 local governments (82 cantons or municipalities and 8 district municipal councils) that have administrative powers. The Cantonal Inter-institutional Co-ordination Councils (CCCI) co-ordinate the design, execution and oversight of public policies at local level. As of 2021, 60 municipalities had a working CCCI (OECD, 2021[4]).

Box 2.1. The Environment and Energy Sector

Entities under the aegis of Ministry of Environment and Energy (MINAE)

- The National Environmental Technical Secretariat (SETENA) manages environmental impact assessment and permitting, and monitors compliance with environmental regulations.
- The Environmental Administrative Tribunal (TAA) arbitrates complaints and referrals for violations of the environmental legislation. It can impose administrative sanctions.
- The Environmental Comptroller supervises compliance with environmental legislation, investigates environmental complaints and reports violations to the judiciary and/or the TAA.
- The National Meteorological Institute (IMN) co-ordinates the meteorological and climatologic activities of the country. It produces the emission inventories of air pollutants and greenhouse gases.
- The National Biodiversity Management Commission (CONAGEBIO) formulates policies for the conservation and sustainable use of biodiversity, as well as access to genetic resources. It oversees the implementation and monitoring of the national biodiversity policy and strategy.
- The National System of Conservation Areas (SINAC) oversees the protected area network. It is also tasked with the integrated management of natural resources (forest, wildlife, water) within and outside protected areas.
- The National Forestry Financing Fund (FONAFIFO) finances afforestation and reforestation activities led by small and medium-sized producers. It manages the Programme of Payments for Environmental Services.
- Other entities: the Commission for the Management of the Upper Reventazón River Basin; the Board of Directors of San Lucas Island National Park; the Board of Directors for the Manuel Antonio National Park Trust; and the Pacific Marine Park.

Autonomous institutions

- The Costa Rican Institute of Aqueducts and Sewers (AyA) plans, regulates and manages drinking water supply and wastewater collection and disposal, partly through the community water associations.
- The Public Services Regulatory Authority (ARESEP) sets service tariffs and monitors the quality and reliability of electricity and fuel supply, water and wastewater services, and public transport.
- The National Emergency Commission (CNE) co-ordinates activities to prevent and respond to natural disasters, including the National Emergency Prevention and Response System.
- The Costa Rican Institute of Electricity (ICE), the state-owned electricity transmission system operator, manages the electricity grids and is the main electricity supplier.
- The Costa Rican Petroleum Refining Company (RECOPE) is the state-owned company that imports, refines and distributes oil and oil products under a monopoly regime. It also develops and manages the related infrastructure.
- The National Forestry Office manages forestry resources and promotes investment in the forestry sector.
- Other autonomous bodies: the National Company of Energy and Light, the Public Services Enterprise of Heredia, and the Administrative Board of the Municipal Electric Service of Cartago.

Source: Country's submission.

The country is divided geographically for various purposes. Several institutions for multi-level governance have different objectives, such as the Regional and Local Councils of Conservation Areas (Chapter 3), the Watershed Committees and the Regional Development Councils. This creates an overly complex, expensive and fragmented system (OECD, 2021[4]).Two national associations of municipalities represent the interests of local governments in relation to central authorities.[3] However, unlike many OECD countries, Costa Rica has no institutionalised mechanisms to co-ordinate national policy decisions with local government associations (OECD, 2021[4]).

As in many countries, local governments handle a wide range of environment-related matters, including urban planning, housing and waste collection. In 2019, they accounted for 57% of spending on environmental protection (Section 2.6). The 2001 constitutional reform formally allocated more powers and budget to subnational governments. According to the reform, municipalities should receive at least 10% of the central government's budget to finance the delegated functions. However, the reform has suffered severe delays and is far from complete. This implies that subnational authorities have still limited budget and implementation capacity (OECD, 2021[4]). Most local governments struggle to collect taxes and service fees, including fees for waste management, street cleaning, lighting and commercial allotments. Revenue from these taxes and fees barely covers human resource costs.

The quality and delivery of environment-related services vary greatly across municipalities and regions. In addition to accelerating implementation of the constitutional reform, Costa Rica could consider establishing a system to redistribute fiscal resources across regions to reduce these disparities (OECD, 2021[4]). Eleven federations of local governments provide technical support to the associated municipalities. There are also examples of co-operation between local governments and stakeholders such as businesses and non-governmental organisations to improve service delivery. However, there is a need to provide nationwide guidance, support and training to local governments to improve their capacity to carry out their environment-related responsibilities.

Costa Rica's legislation does not allow municipalities to create inter-municipal structures or shared service arrangements to pool resources and provide services to a wider population. Such legislative barriers should be removed. The experience of other OECD countries shows that sharing arrangements allow better services at lower costs through economies of scale (OECD, 2019[6]). For example, French municipalities can create a "community" and delegate to it certain responsibilities or services. A similar experience in Chile has helped improve the quality of waste collection and treatment services in a province (Box 2.2).

Costa Rica's only example of inter-municipal association is the Metropolitan Federation of Municipalities of San José, which promotes co-operation for spatial planning among the capital of San José and its nine neighbouring municipalities. The Greater Metropolitan Area (GAM) around San José comprises 31 municipalities, including the country's four largest cities (San José, Alajuela, Cartago and Heredia). It is home to 73% of the country's population. The GAM is a geographical designation used for spatial planning, but there is no metropolitan structure to co-ordinate management of public urban services such as public transport and waste management (Chapter 1).

2.2.4. Public participation in environmental decision making

Costa Rica has made remarkable progress in implementing the open government principles of transparency, accountability and participation. Its legal and institutional frameworks for open government are on par with OECD standards (OECD, 2021[4]). The National Constitution grants rights to participation, petition and access to information of public interest.

Box 2.2. A consortium of municipalities for managing waste in Chile

The Association of Municipalities of the Province of Llanquihue for Sustainable Waste Management and Environmental Management conglomerates all the municipalities of Llanquihue to jointly manage solid waste while optimising use of resources. An executive secretary and technical unit are in charge of administration. A technical committee gathers professionals from participating municipalities to co-ordinate and carry out waste management activities.

The association helped overcome decades of poor waste management by individual municipalities working separately. Municipalities did not have the appropriate resources or capacity to manage waste efficiently, from collection to disposal. The association has subsequently expanded its activities into recycling and capacity.

The association has been operating since 2016. Despite its effectiveness in managing waste, the association depends on the fees paid by participating municipalities – and thus on political will. This makes its financing unstable and jeopardises the quality of the service.

Source: OECD (2017), *Making Decentralisation Work in Chile: Towards Stronger Municipalities*, OECD Multi-level Governance Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264279049-en.

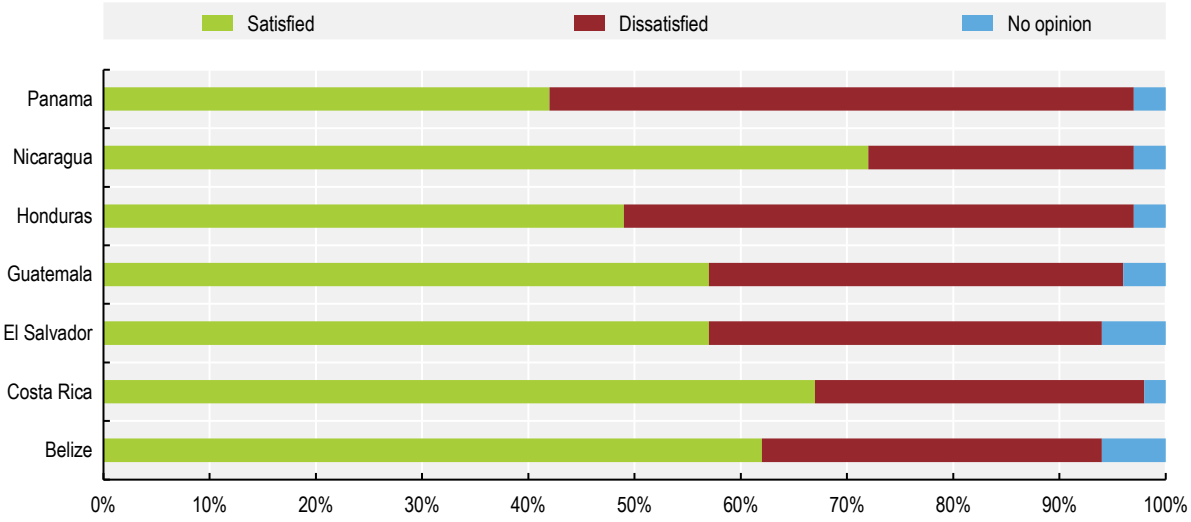
Public participation and consultation of Indigenous Peoples are required by law for the formulation of several public policies and environmental decision-making processes. These include the environmental impact assessment (EIA) procedures of projects and activities, as well as, to a lesser extent, for strategic environmental assessment (SEA) of land-use plans (Section 2.3.2). Several mechanisms for public participation are in place. These range from making documents open to public for comments to organising public hearings or establishing special bodies to ensure public engagement. For example, the National Biodiversity Management Commission (Box 2.1) set up a plenary committee to promote participation of stakeholders in policy formulation and implementation.[4] Another example is the Citizen Advisory Council on Climate Change, which was established in 2017 to inform the design, application and evaluation of climate policies.

The government has made efforts to better involve indigenous communities in the policy process. Government institutions are required to consult Indigenous Peoples before implementing policies, measures and projects that can potentially affect their communities. In 2018, the government introduced the General Mechanism for Consultation of Indigenous Peoples to implement its obligation to consult. The mechanism was used to update the National Water Policy and the National Plan for the Integrated Management of Water Resources, among others. The Network of the Indigenous Bribri-Cabecar Communities was founded in 2005 to strengthen the participation of these communities, improving their living conditions and their institutional leverage. The network has also been useful to encourage Indigenous Peoples to fight for their right to land use, while respecting their traditions (OECD, 2021[4]).

Despite an advanced framework for encouraging public participation in policy making, active engagement of citizens and civil society organisations remains limited and trust in government is relatively low (OECD, 2023[1]; OECD, 2021[4]). Nonetheless, citizens' support for environmental policies has remained above 50% since 2010 (Gallup, 2022[7]). The population shows a high degree of satisfaction (67%) with the country's efforts in protecting the environment – the second highest level in Central America (Figure 2.1). In a 2019 opinion poll, respondents identified insufficient public transport and inadequate waste management as the top two obstacles on Costa Rica's decarbonisation path. These are followed by traffic congestion and pollution, insufficient incentives for the clean energy transition, and inadequate land management and deforestation (Ministerio de Comunicaciones, 2019[8]).

Figure 2.1. Most people in Costa Rica are satisfied with its environmental protection efforts

Satisfaction with environmental protection efforts in their countries, Central American countries, latest available year



Note: Question: "In this country, are you satisfied or dissatisfied with efforts to preserve the environment?"
Source: (Gallup, 2022[7]).

StatLink https://stat.link/rod0jg

Costa Rica has taken important steps in improving availability of environmental information. The National Environmental Information System (SINIA) was established in 2013 to co-ordinate the collection of environmental statistics and disseminate them through a single web repository. The National System of Climate Change Metrics (SINAMECC), established in 2018, is a parallel platform for information related to climate change. Both systems are led by MINAE and are part of the National Statistics System. The Central Bank of Costa Rica (BCCR) produces the environmental accounts of water, forests, materials and energy, and surveys environmental spending of businesses (Section 2.7). More work is needed to extend the coverage of SINIA, as much information is still scattered across ministries, their subsidiary entities and other autonomous bodies. In addition to government institutions, the National Council of Rectors (CONARE), a consortium of the country's five public universities, maintains publicly available databases. It releases annual reports as part of its research initiative on sustainable human development (*Programa Estado de la Nación*).

However, many data are not produced systematically and are outdated. The first and last state of the environment report was released in 2017. Work is progressing to update the report, as well as to implement a pollution release and transfer registry. Important information gaps persist, including on greenhouse gas (GHG) emissions, air and water quality, and waste (Chapter 1), as well as the oceans (Chapter 3). These gaps impede evidence-based decision making and informed citizen engagement. Increased funding, deployment of Earth observation technologies and enhanced collaboration with the scientific community would help improve production, collection and dissemination of environmental statistics as part of the SINIA.

2.3. Setting sound environmental requirements and ensuring their fulfilment

2.3.1. Environmental policy and legal framework

Costa Rica has a long-standing environmental policy framework based on its 1949 National Constitution and an extensive legislation. Article 50 of the Constitution recognises citizens' right to a healthy and ecologically balanced environment. In 2020, Article 50 was reformed to define access to safe drinking water as a basic and inalienable human right. Costa Rica's environmental legislation includes one overarching law (the 1995 Organic Law on the Environment) and several thematic laws, resulting in more than 275 environmental laws. The Organic Law on the Environment aims to prevent and minimise adverse environmental impacts and sets the framework for environmental permitting, including EIA and compliance assurance (Sections 2.3.2 and 2.3.3).

Costa Rica's environmental legal framework is largely in line with requirements set by OECD legal instruments in the environmental field (OECD, 2019[9]). It has continued to evolve in recent years. Indeed, in 2021 and 2022, 153 new environmental provisions were approved, more than the average of the five previous years. Most of the new environmental regulations were dedicated to biodiversity and protected areas and needed to implement previously adopted provisions. As of June 2021, Costa Rica had signed and ratified over 51 international environmental agreements. However, many policy goals and objectives do not translate into concrete measures and adequate financing (CONARE, 2022[2]). Many regulations lack adequate implementation and enforcement.

2.3.2. Environmental impact assessment and permitting

In line with OECD standards, an EIA is required for any activity, work or project that entails risks of adverse impacts on the environment. The National Environmental Technical Secretariat (SETENA) manages the EIA procedure and issues the corresponding Environmental Viability or Licence (*Viabilidad (Licencia) Ambiental*, VLA). A VLA is a pre-condition for obtaining construction, operating and several sector-specific permits. These include a wastewater discharge permit from the Water Directorate of MINAE and a Sanitary Operating Permit (PSF) from MINSA.[5] Since 2006, land-use plans (including Cantonal Regulatory Plans) are subject to an SEA with a view to obtaining a VLA.

The EIA process differs according to the potential impact of the activity, with stricter requirements for activities with a potentially high or moderate-high environmental impact (Box 2.3). Following the EIA, and depending on its results, SETENA issues the VLA. The VLA sets out environmental requirements for activities or projects. However, these conditions could better reflect the implementation of Best Available Techniques (BAT).[6] All documents produced as part of the EIA process are open to the public, and the public has the possibility of being actively involved in the process (Box 2.3). Municipalities can conduct public hearings for the environmental assessment of land-use plans.

In line with good international practice, a financial mechanism is in place to guarantee that the conditions set in the VLA are met (Box 2.3). However, evidence suggests that financial deposits are often returned to developers even when their mitigation and compensatory actions did not offset the potential environmental loss (Bonilla-Murillo et al., 2022[10]). These financial guarantees could be used more effectively to ensure compliance of activities with the VLA requirements, as well as the execution of compensatory measures that respect the ecological equivalence principle. As in other countries, the overall effectiveness of the assessment process can be strengthened. Some weaknesses in SETENA's governance and procedures negatively affect the quality of its EIA (CGR, 2022[11]). A 2023 regulation aims to streamline the EIA and VLA issuance processes and make them more efficient.

In 2022, Costa Rica launched a comprehensive reform to streamline the now cumbersome system of government approvals and reduce the regulatory burden on businesses. Integrated environmental permits will be part of the "Single Window of Investment" (*Ventanilla unica de inversion, VUI*), a paperless one-

stop shop for permits. This reform is based on the concept of regulatory differentiation, whereby activities with a low level of environmental risk warrant simpler applications. Environmental inspections will also be integrated. This would align Costa Rica with the OECD standards on integrated pollution prevention and control.

Box 2.3. The Environmental Impact Assessment process in Costa Rica

The EIA process starts with a preliminary assessment, during which activities with a potentially high or moderate-high environmental impact are subject to a formal scoring process. Conversely, activities with a potentially moderate-low and low impact need only submit a simplified application (the classification of activities according to their potential environmental impact is contained in a 2004 executive decree). The formal scoring reflects the size of potential impact and determines the type of document the developer would have to submit: a declaration or a full environmental impact study with an environmental management plan. The environmental impact study must also include an analysis of alternatives. SETENA may conduct on-site inspections prior to EIA approval.

Anyone can consult the documents produced as part of the EIA process, either at the offices of SETENA or on its website. The developer must engage with the local population if the activity is likely to generate social tensions or affect indigenous communities. The public can request to be a party to the EIA procedure (and be notified of its every step) and comment on the developer's submissions in writing, in a meeting with SETENA technical staff or in a public hearing. Any natural or legal person can initiate a public hearing, but SETENA decides whether to proceed. It bases its decision on several criteria: perceived information gaps regarding the project, its high environmental impact or social implications, or lack of appropriate public consultation by other means. Public hearings are uncommon, primarily because they are seldom requested.

Upon receiving a VLA, the project developer must deposit a financial environmental guarantee of up to 1% of the amount of project investment (the guarantee is higher for mining and hydropower projects). SETENA can use the guarantee to recover remediation costs in case of environmental damage. To get the deposit back, the developer must implement the measures prescribed in the VLA to mitigate or compensate for environmental impacts and request the closure of the project.

Source: Country's submission.

2.3.3. Compliance monitoring and enforcement

The Environmental Comptroller within MINAE has broad supervisory functions over compliance with environmental legislation (Box 2.1). Each authority (SETENA, MINSA, SINAC, municipalities and others) inspects compliance with the laws, decrees and permits under its competence.[7] However, in practice, most on-site inspections react to incidents or public complaints to the competent authority.

Costa Rica has encouraged citizens to help monitor compliance. The Environmental Comptroller operates the Integrated System of Procedures and Consideration of Environmental Complaints for receiving and handling signals on non-compliance from the public (Box 2.4). It also maintains the registry of the Natural Resources Surveillance Committees (COVIRENAs). Defined by a 2016 decree, COVIRENAs are civil society organisations of volunteer environmental inspectors. They collaborate with public employees to enforce environmental legislation and protection of natural resources. In 2021, there were 40 registered committees and 294 volunteer inspectors.

Box 2.4. An integrated system to submit and handle environmental complaints

The Integrated System of Procedures and Consideration of Environmental Complaints (SITADA) is the official system to submit a complaint against suspected environmental non-compliance and to follow up the complaint as it moves through the system. Every citizen can access the system. The Environmental Comptroller issues an annual report based on the SITADA data, which it disseminates to the press and publishes on its website. In 2021, SITADA received 6 977 complaints, more than three times the number from 2017 (Figure 2.2). In 2021, almost half of the complaints concerned forests, followed by those related to biodiversity loss and water pollution. Over 30% related to illegal logging and/or harvesting, followed by referrals of wild animals in danger, encroachment on protected water bodies and illegal possession of wild animals.

When an environmental complaint or referral is entered into the system, the competent agency is required to follow up through on-site inspections and an investigation report. Over the years, SINAC has handled the most complaints of any government agency; indeed, in 2021, it handled more than 5 000 complaints, or more than 70% of all referred cases in SITADA. The competent authority verifies compliance with environmental regulations for each complaint. When non-compliance is detected, the complaint is referred to the judiciary, the Environmental Administration Tribunal (TAA), the National Mining Registry or the Plenary of SETENA. In 2021, 58% of complaints were closed without consequences, 18% were brought before the judiciary and 1% went before the TAA (Figure 2.2).

Source: MINAE (2021), Sistema Integrado de Trámite y Atención de Denuncias Ambientales (SITADA), Estadísticas 2021, MINAE Contraloría Ambiental, San José, https://contraloriaambiental.go.cr/doc_/doc_1644441660.pdf.

Implementing risk-based planning for environmental inspections would make compliance monitoring more efficient and reduce its reliance on environmental complaints. Complaints have increased steadily since 2017, but most of them are closed without consequences (Figure 2.2). This raises the concern that many complaints may be unsubstantiated but still require authorities to investigate. This, coupled with a general understaffing of competent authorities, may lead to clogging the environmental enforcement system. More generally, there is room to better support the regulated community fulfil its environmental requirements by providing technical assistance and information on best practices. Similar compliance promotion activities would help reduce the compliance monitoring workload on authorities, while improving the environmental conformity of regulated activities.

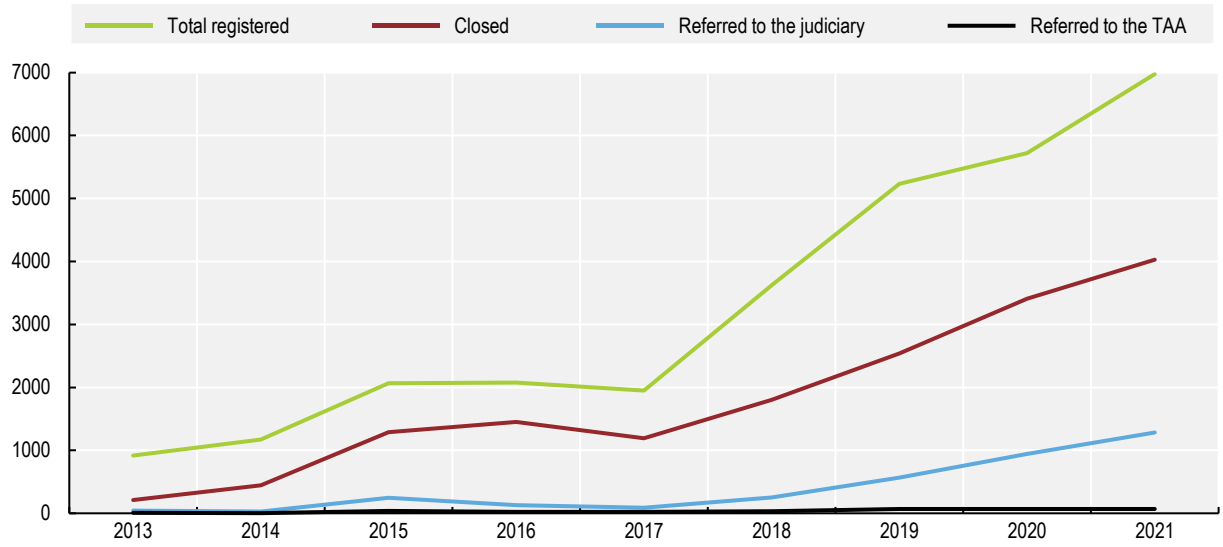
When non-compliance is detected, complaints or referrals from inspecting authorities are transmitted to the Environmental Administrative Tribunal (TAA) and/or the judiciary for criminal enforcement. The TAA can prescribe precautionary measures and issue compliance orders. It can impose administrative sanctions, including temporary or permanent cancellation of permits, closure of premises and companies, fines and compensation for environmental damage. If a compliance order is not implemented in a specified timeframe, the TAA may refer the case to the Environmental Prosecutor's Office for criminal enforcement. The administrative and criminal enforcement processes can run in parallel.

Environmental damage is assessed by competent authorities such as the Directorate of Geology and Mines or the MINAE Water Directorate, MINSA or municipalities, with results presented to the TAA. Compensatory payments are channelled to the treasury and do not contribute directly to remediation of environmental damage. The same authorities calculate fines in relation to the estimated value of environmental damage but not to the benefits of the operator from non-compliance. There are no levels or intervals for administrative fines defined in the legislation. According to international best practices, fines should reflect the gravity of the offence to be an effective deterrent. Moreover, fines should recover the economic benefits to the operator from non-compliance. Revenues from fines are channelled to MINSA or

to the municipality where the offence occurred rather than the general state budget. This, however, can generate perverse incentives and conflicts of interest.

Figure 2.2. The number of environmental complaints has increased

Number of complaints registered in SITADA, by outcome, 2013-21.



Source: MINAE (2021), *Sistema Integrado de Trámite y Atención de Denuncias Ambientales (SITADA), Estadísticas 2021*, MINAE Contraloría Ambiental, San José, https://contraloriaambiental.go.cr/doc_/doc_1644441660.pdf.

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The number of TAA staff is largely insufficient to cope with the increasing number and complexity of complaints. A backlog of cases has accumulated over time. As of 2011, each of the 11 lawyers of the tribunal was responsible for about 455 cases. As a result, the time to conclude each case has grown well over one year.

2.3.4. Access to justice in environmental matters

Every person has legal standing to denounce any acts that may violate the constitutional right to a healthy and ecologically balanced environment and to safe drinking water. Every citizen can file a complaint for suspected non-compliance with environmental provisions and claim compensation for the resulting damage (Box 2.4).

Access to remedy for environmental impacts can also be sought through the country's Ombudsperson (*Defensoría de los Habitantes de la República* or DHR). The DHR can investigate actions and omissions by public entities, as well as by public and private companies providing public services, that contravene environmental laws. It can then issue recommendations with a view to protecting environmental rights effectively. For example, the DHR monitors the inter-institutional process for improving the registration of agrochemicals. It also monitors government measures to eliminate the use of mercury in artisanal and small-scale gold mining activities in compliance with the Minamata Convention. The DHR has often intervened to require both the Costa Rican Institute of Aqueducts and Sewers (Box 2.1) and the municipal aqueducts to upgrade and extend water infrastructure to improve access to safe water and sanitation (DHR, 2022[12]) (Chapter 1).

In line with its environmental democracy tradition, Costa Rica was one of the promoters of the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement). The agreement is modelled after the Aarhus Convention of the United Nations Economic Commission for Europe. It is the first international agreement that includes binding provisions on protecting human rights defenders in environmental matters. The agreement entered into force in April 2021; at the time of writing, 14 of 25 signatory countries had ratified the agreement.

Costa Rica has taken several measures to protect environmental human right defenders and Indigenous Peoples but has not ratified the Escazú Agreement. As recommended by OECD (2023[13]), "Costa Rica could consider the possibility of taking steps towards the ratification of the Escazú Agreement". This ratification would further consolidate the country's significant efforts to build an advanced legal framework to manage the environment and guarantee environmental democracy.

2.4. Greening the system of taxes and charges

2.4.1. Towards a green tax reform

Costa Rica's level of taxation is in line with regional peers but lower than in most OECD countries. This is due to a large share of informal employment, high tax evasion, narrow tax bases and various tax expenditures. Total tax revenues were about 23% of GDP in 2020, compared to the OECD average of 33%. The tax system has a weak redistributive performance and relies on high social security contributions, which favour informality (OECD, 2023[1]).

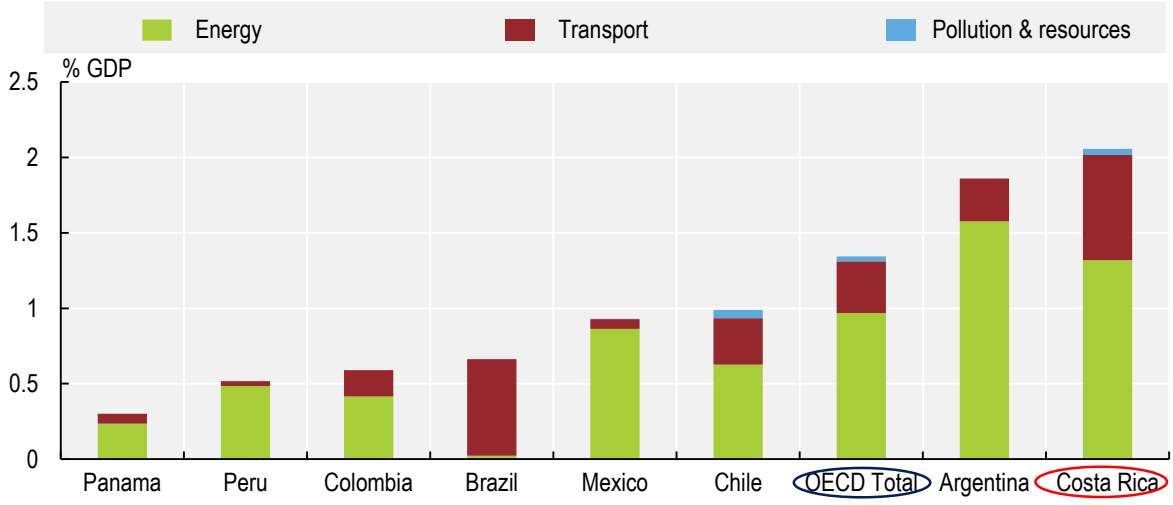
Environment-related taxes are an important source of fiscal revenue in Costa Rica. On average, they accounted for about 10% of total tax revenue and 2.3% of GDP in 2010-21, above the 2010-21 averages in the OECD (6.8% and 2.2%). These shares were also higher than in other major Latin American countries (Figure 2.3). Most receipts come from the excise duty on fuels and, to a lesser extent, from vehicle taxes. Taxes on pollution and resource management mainly apply to wastewater discharges and water use (Chapter 1) and generate limited revenue (Figure 2.3).

Revenue increased steadily and strongly (by over 30% in real terms) between 2010 and 2021. This increase was in line with a rising number of vehicles on the roads and higher fuel consumption (except in 2020, at the peak of the COVID-19 pandemic) (Figure 2.4). Proceeds from environment-related taxes are partly earmarked for environmental purposes. In particular, 3.5% of the fuel excise duty revenue is allocated to the National Forestry Financing Fund for the Programme of Payments for Environmental Services (PPSA) and represents 90% of the PPSA funding. A quarter of the proceeds from the Water Utilisation Levy are earmarked for the PPSA and another 25% is allocated to SINAC (Chapter 3).

When considering the value added tax (VAT) and custom duties on vehicles and VAT on fuels, the tax revenue linked to vehicle ownership and use reaches 20% of total tax revenue, according to Ministry of Finance estimates. These revenues are expected to decline by, on average, 0.4% of GDP per year in 2023-50. This is in keeping with implementation of the PND 2018-50, which anticipates the electrification of vehicles and a shift to public transport and active mobility (Chapter 1). A tax reform should become operative by 2030 to eliminate the fiscal impact of transport decarbonisation, if PND plans proceed (Victor-Gallardo et al., 2022[14]). The expected decline in fuel tax revenue will also reduce funds available for environmental activities, and primarily for implementation of the PPSA. It is, therefore, urgent to delink the PPSA from fuel tax revenue (Chapter 3).

Figure 2.3. Environment-related taxes are an important source of fiscal revenue in Costa Rica

Environment-related tax revenue as a share of GDP, by tax base, selected Latin American countries, 2021.



Note: OECD weighted average in 2020.
Source: OECD (2022), "Environmental Policy: Environmentally related tax revenue", *OECD Environment Statistics* (database).

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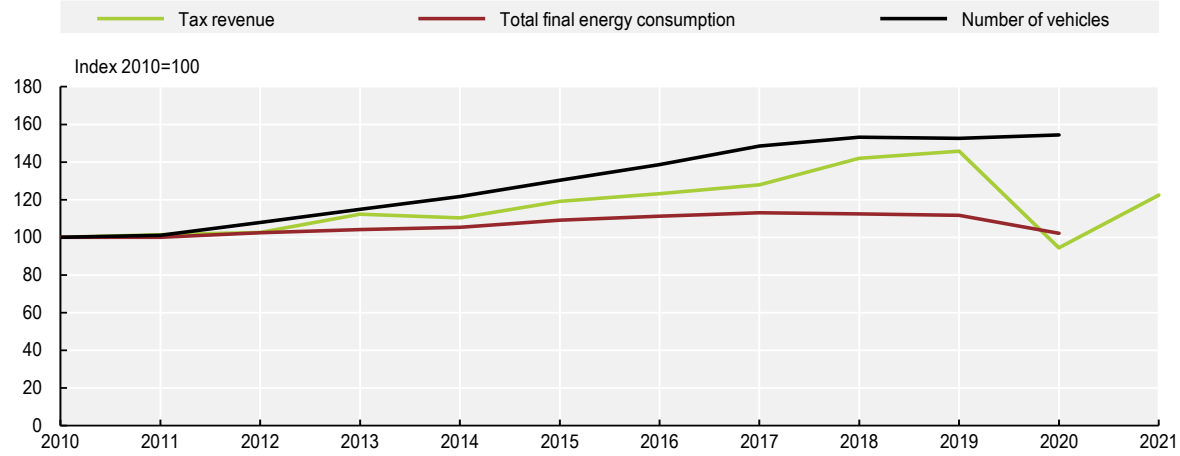
Figure 2.4. Revenue from environment-related taxes grew in line with fuel use and vehicle fleet

Revenue from environment-related taxes, energy consumption and vehicle fleet, Costa Rica, 2010-21.



Note: The number of vehicles corresponds to those paying the right of circulation in the country.
Source: CONARE (2021), *Programa Estado de la Nación* (database); IEA (2023), "World energy statistics", *IEA World Energy Statistics and Balances* (database). OECD (2022), "Environmental Policy: Environmentally related tax revenue", *OECD Environment Statistics* (database).

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The PND mandates the Ministry of Finance, in collaboration with MINAE, to design a green tax reform to find alternative sources of tax proceeds to offset the revenue loss from vehicle and fuel taxes. The PND foresees progressive elimination of fossil fuel subsidies and introduction of a carbon pricing scheme. These

intentions are welcome. As discussed in the following sections, the fuel and vehicle taxes should be redesigned to encourage a shift towards cleaner vehicles, public transport and active mobility. In the longer term, a shift from taxation of energy use to the taxation of road use will be needed to ensure a sustained revenue stream (van Dender, 2019[15]). There is also room to introduce taxes on resource use and pollution. These taxes could target chemical fertilisers and pesticides, which are intensively used (Chapter 3), as well as landfilled waste and plastic bags or other plastic products, with a view to improving waste management and reduce plastic pollution (Chapter 1).

The green tax reform should also aim to reduce tax avoidance and make the tax mix more progressive and conducive to creating jobs and moving towards a more formal economy by, for example, reducing social security contributions. Gradually introducing a comprehensive package of tax measures will help smooth the costs of reform across sectors and over time. The package should include relatively low tax hikes but spread across several taxed products such as fuel, vehicles and electricity (Victor-Gallardo et al., 2022[14]). Part of the revenues from new or increased environment-related taxes and subsidy removal should be used in a well-targeted way to reduce the impact on low-income households and most affected economic sectors. This would improve social acceptability of the reforms. Part of the revenue could also be used to finance low-carbon investment and other environment-related actions, such as the PPSA. As revenue earmarking can reduce efficiency of public spending, such arrangements should be clearly communicated and periodically reassessed in a transparent way (Marten and van Dender, 2019[16]).

2.4.2. Energy taxes and carbon pricing

Since 2001, Costa Rica has applied an excise duty on fuels (the Single Tax on Fuels or IUSC) and electricity. The rates vary with fuel products, irrespective of the energy or carbon content of the fuels. They are updated quarterly to the consumer price index (CPI) with a maximum 3% increase per quarter.

Road fuel prices and taxes do not fully reflect the social costs of fuel use, including costs associated with emissions of GHGs and local air pollutants, accidents and congestion (Parry, Black and Vernon, 2021[17]). The energy tax on diesel is 57% that on petrol, despite the higher carbon content per litre of diesel and higher emissions of local pollutants from diesel vehicles. This diesel tax discount is common to most other OECD and Latin American countries but remains unjustified on environmental grounds (OECD, 2022[18]). Gradually increasing the IUSC rate on diesel to at least match that on petrol would encourage a shift towards cleaner vehicles, especially in the freight sector where diesel is most used. Some types of fuels and some sectors benefit from preferential tax treatments and other forms of price support that reduce the incentive for energy savings (Section 2.5.2).

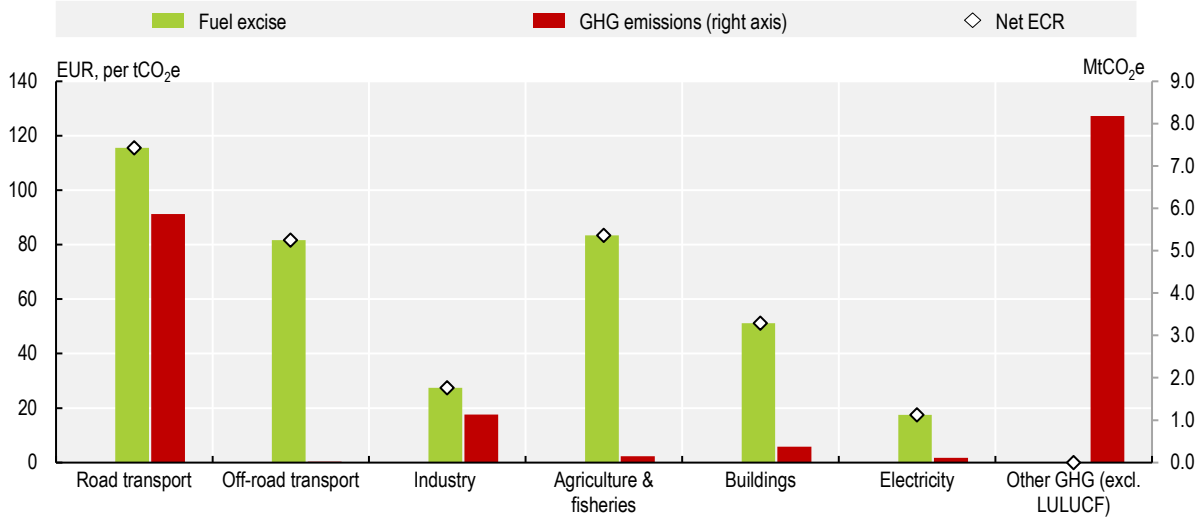
Fuel excise taxes are the only way GHG emissions are priced in Costa Rica. There is no carbon tax or emissions trading system in place. Therefore, in 2021, the net effective carbon rates (ECR) coincided with the fuel excise taxes net of pre-tax fossil fuel subsidies.[8] Costa Rica priced 46% of its GHG emissions. While this is below the OECD average of 68%, it is among the highest shares in Latin America and the Caribbean (LAC) (Figure 7 in Assessment and recommendations). Nearly 40% of the country's GHG emissions are priced at a net ECR above EUR 60 per tonnes of carbon dioxide (CO_2), which is the midpoint estimate of climate damage caused by each tonne of CO_2 emitted in 2020. This is a higher share than in the OECD and most LAC countries (Figure 7 in Assessment and recommendations).

In 2021, the economy-wide net ECR was nearly EUR 47 tCO_2, or three-quarters the OECD average. As in all countries, net ECRs vary by sector and by fuels (Figure 2.5). In 2021, the average net ECR in the non-road transport sectors was aligned with the OECD average. Meanwhile, the average net ECR on road transport fuels was nearly EUR 116 tCO_2 or just two-thirds the OECD average. Nonetheless, net ECRs on road fuels are the highest among the major LAC economies. Virtually all CO_2 emissions from road transport are priced above the EUR 60 benchmark in Costa Rica, as well as all emissions from off-road transport and most CO_2 emissions from energy use in agriculture. However, all emissions of GHGs other than CO_2

(mostly methane and nitrous oxide) are not priced at all (Figure 2.5). No emissions are priced at or above EUR 120 tCO_2, a midrange estimate of carbon costs in 2030 (OECD, 2022[18]).

Figure 2.5. Carbon prices are highest for road transport and zero on non-energy-related emissions

Average effective carbon rates and GHG emissions by sector, 2021.



Note: In Costa Rica, the Effective Carbon Rate (ECR) coincides with fuel excise taxes. The Net ECR is the ECR minus fossil fuel subsidies that decrease pre-tax fossil fuel prices.
Source: OECD (2022), *Pricing Greenhouse Gas Emissions: Turning Climate Targets into Climate Action*, OECD Series on Carbon Pricing and Energy Taxation, OECD Publishing, Paris.

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Costa Rica should follow through with a carbon pricing scheme as foreseen by the PND 2018-50. This could take the form of a carbon tax element of the fuel excise levy. Its rate could be set at a low level and gradually raised according to a pre-determined schedule. A credible path of future carbon prices would provide an incentive for low-carbon consumption and investment without immediately imposing the burden on households and firms at times of high cost of living. OECD (2022[18]) estimates that introducing a carbon tax of EUR 120 tCO_2 would yield revenue equal to 0.3% of GDP. This compares with the expected revenue decline due to transport decarbonisation of 0.4% of GDP in Victor-Gallardo (2022[14]) (Section 2.4.1). Even if the carbon tax revenue will decrease over time with decarbonisation of the economy, it can help finance the adjustment costs at the start of the transition. Part of the carbon tax revenue should be used to alleviate the impact of higher energy prices on low-income households. In many countries, transferring a third of the additional revenues to poor households through means-tested benefits is sufficient to mitigate energy affordability risk (Flues and van Dender, 2017[19]). Compensation through preferential tax rates should be avoided as it undermines the incentive of carbon pricing.

2.4.3. Vehicle taxes and road charging

There is scope to improve the design of vehicle taxes to encourage a shift to more energy-efficient and less polluting vehicles. The annual vehicle tax applies the same rate, regardless of fuel consumption capacity or emission levels. It is levied as a percentage on the fiscal value of vehicles, with the rate depending on the model of the vehicle. The fiscal value is adjusted annually for inflation but reduced by 10% for depreciation every year. Inflation has been consistently below 10% since 2009, which implies that

the tax amount declines with the vehicle age (Rodríguez-Garro, 2020[20]). This system favours old and potentially less safe and more polluting vehicles. This distortion needs to be eliminated. At a minimum, the annual depreciation rate should be reduced and adjusted to the average useful life of vehicles, which is above ten years (Rodríguez-Garro, 2020[20]).

Electric vehicles (EVs) and their spare parts benefit from several tax exemptions (general sales tax, selective consumption tax and customs value tax). In 2020, these exemptions amounted to CRC 365 million (about USD 650 000) (Ministerio de Hacienda, 2021[21]). EVs also benefit from other incentives such as green plates and free parking spaces. These incentives have encouraged a rapid increase in EV sales in the last few years (Figure 4 in Assessment and Recommendations). However, the number of EVs still represented 0.5% of the vehicle fleet in 2021. The PND 2018-50 aims to achieve 30% of EVs in the light vehicle fleet (including cars) by 2035 (Chapter 1).

As the country's EV market matures, purchase subsidies should be phased out (IEA, 2022[22]). These subsidies should be accompanied and progressively replaced by higher taxation of internal combustion engine vehicles (ICEVs). This should aim to reduce the difference in purchase price or lifetime cost between EVs and ICEVs. Costa Rica should revise vehicle taxes and modulate them according to the vehicles' fuel efficiency and levels of local pollutant emissions. Adding a weight element would help address road wear and associated particulate pollution. Vehicle taxes should be combined with more stringent emission standards (Chapter 1). The government should reconsider its decision of delaying from 2023 to 2027 the entry into force of Euro 6 or Tier 3 standards.[9] This postponement aimed to contain rising energy prices, as the stricter vehicle standards would entail the import of more expensive fuels (Section 2.5.2).

As EVs become widespread, Costa Rica will eventually need comprehensive road use charging to internalise costs of car use and substitute transport fuel tax revenues (van Dender, 2019[15]). Road tolls finance road developments but have not been updated since 2002. As a first step, as suggested by OECD (2023[1]), the government should raise road tolls to reflect the cost of road use as soon as inflationary pressures abate. Looking ahead, Costa Rica would benefit from developing a distance-based road pricing system. This would apply different rates depending on the location and time of the driving and the emission performance of vehicles. This, in turn, would allow to reflect the different externalities (air pollution, road wear and tear, accidents, etc.) of driving.

Costa Rica could explore the introduction of congestion charges, potentially in combination with low-emission zones, to address congestion and air pollution in urban areas. In 2017, the social costs of transport in the GAM were estimated at USD 3.1 billion (or about 5% of GDP), more than 90% of which linked to accidents and road congestion (CONARE, 2018[23]). Driving restrictions based on licence plates have long been in place to manage entry of cars and vans into San José city centre during weekdays from 6:00 am to 7:00 pm.[10] Cars with four travellers and EVs are exempted, as are heavy goods vehicles. This measure has largely been ineffective because many households own more than one car, which allows them to circumvent the restriction. The experience of other countries shows this kind of traffic regulation can also have perverse effects, such as shifting congestion outside the restricted areas and hours and stimulating the purchase of second-hand vehicles (Blackman, Li and Liu, 2018[24]).

Implementing congestion charges would help curb peak-time congestion in a cost-effective and socially fair manner. As in other middle-income countries, cars are used by the most affluent people while low-income households tend to use public transport (CONARE, 2020[25]). By increasing driving costs, congestion charges discourage trips that are less necessary or that can be made at less congested periods, thereby reducing traffic. Travel conditions improve for drivers that pay the charge, as well as for buses. Revenue from the charges could fund a much-needed integrated public transport system in the GAM, together with walking and cycling infrastructure (Chapter 1). The GAM could consider the example of Bogotá, which added a charge to its long-standing plate-based traffic restriction (*Pico y Placa*).[11] A pilot

charging system and effective communication campaigns could help showcase the benefits of the system and gain citizens' support (OECD, 2021[26]).

2.5. Removing subsidies with potentially negative environmental consequences

2.5.1. A stocktaking of environmentally harmful support

In 2021, the Ministry of Finance categorised tax expenditures (i.e. tax revenue forgone due to exemptions, discounts and other forms of preferential tax treatment) according to their environmental impact. It estimated that environmentally harmful tax expenditure amounted to nearly CRC 88 billion (USD 150.45 million) or 0.24% of GDP in 2020. More than 70% of this revenue loss was for tax discounts and exemptions on machinery and other inputs for agriculture and fishing (Chapter 3). Agricultural inputs, such as fertilisers and pesticides, have long benefited from a total sales tax exemption. In 2018, this was replaced by a reduced VAT rate of 1% (compared to the standard rate of 13%). The remaining part of environmentally harmful tax expenditure was linked to fossil fuel support, which also includes direct transfers (Section 2.5.2). In comparison, tax expenditures with positive environmental impact were negligible, amounting to about CRC 3 billion (USD 5.13 million) (Ministerio de Hacienda, 2021[21]).

Costa Rica should build on the Ministry of Finance's stocktaking of tax expenditure to develop a plan to phase out environmentally harmful subsidies, including support to energy use and agriculture (Chapter 3). The stocktaking should be completed with the identification of direct subsidies, in addition to tax expenditure, and an evaluation of the economic, social and environmental effects of support measures. Such evaluation is key to prioritise the support measures that need reform.

Any subsidy reform plan should also assess its distributional implications. It should propose alternative measures to achieve the same policy objectives more cost effectively and with better environmental or social outcomes (Elgouacem, 2020[27]). Alternative policies include means-tested cash transfers, investment in public services or general support for the competitiveness and innovation of the affected economic sectors. Such an approach would help minimise adverse impacts of subsidy reform and, in turn, reduce the risk of political backlash and backtracking.

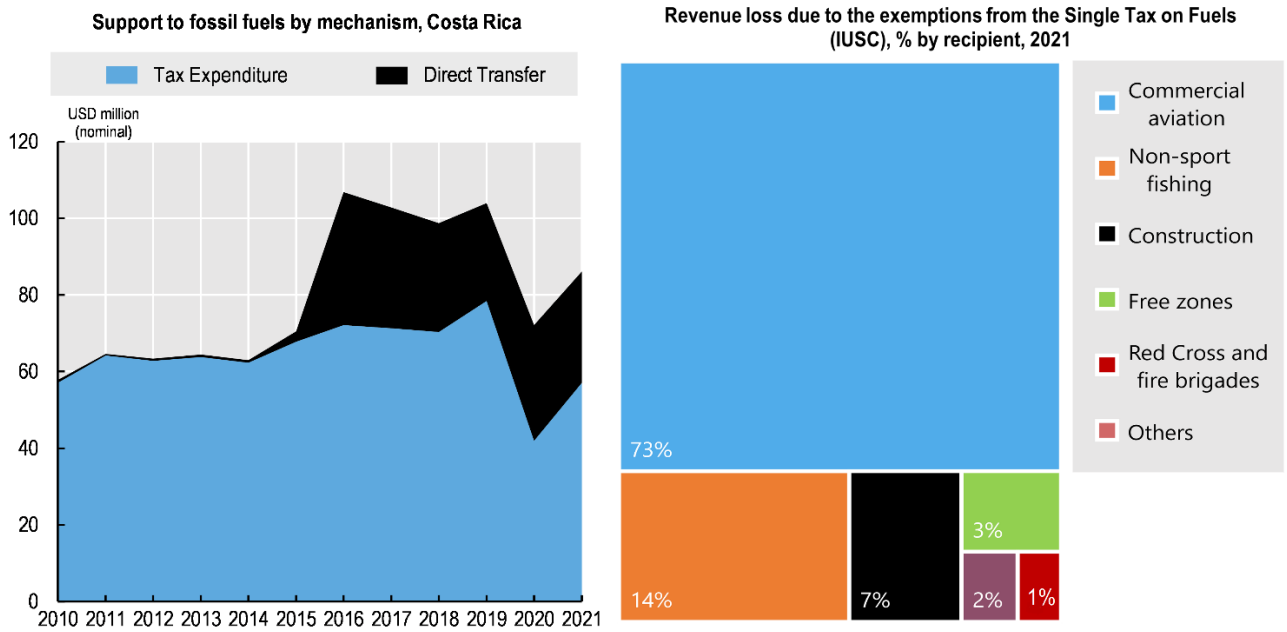
2.5.2. Fossil fuel subsidies

Fossil fuel support amounted to USD 86 million, or about 0.13% of GDP in 2021 (OECD, 2023[28]). This is a lower amount than in regional peers and many other OECD countries. That said, international comparisons are only indicative due to the estimation methodology and data collection. Support is nearly exclusively linked to the use of petroleum products. Two-thirds of support is provided through tax expenditure (Figure 2.6). Exemptions from the IUSC excise duty is the main form of support, accounting for 65% of all support to fossil fuels in 2021. These exemptions benefit mainly fuels used in commercial aviation and the fishing fleet (Figure 2.6). A price discount on liquefied petroleum gas (LPG) is the second largest form of support, accounting for 26% of support to fossil fuels. The cost of the LPG price discount is recovered through the prices of other fuels, mainly petrol and diesel. This mechanism was introduced in 2016 and led to a hike in budgetary transfers to fossil fuels that year and in the following years. Revenue loss due to tax relief increased in the last decade in line with increased fuel use in aviation, except for the pandemic-related drop in 2020 (Figure 2.6). Nearly all forms of support benefit end-users of fuels.

In 2022, in response to rising energy prices and inflation, the government introduced some measures to contain the energy price hikes. These measures will likely translate into higher fossil fuel support. In particular, the government more than halved the IUSC tax rate on LPG for six years, thereby lowering its price by 7.5%. This measure targets low-income households, who are the main users of LPG for cooking and heating. It also aims to support the recovery of the pandemic-stricken services sector, in particular tourism and leisure-related activities. The government took measures also on other fuels: it froze the

quarterly adjustment of the IUSC to the CPI for six months; it introduced a temporary cross-subsidy benefiting diesel, which is mostly used in freight, agriculture and shipping; and ended a cross-subsidy for bitumen. As this subsidy was paid for by higher taxes on petrol and diesel, its elimination helped contain the prices of road fuels. Overall, these measures reduced the prices of diesel and petrol by less than 1%. They were less costly and less regressive than in regional peers, with a fiscal cost of only 0.02% of GDP (Garcimartín and Roca, 2022[29]). Nonetheless, measures to cap energy prices tend to discourage energy savings.

Figure 2.6. Government support to fossil fuels grew in the last decade



Note: Fossil fuel support figures are provided on a "best estimate" basis, as several subsidies and broader support measures may not be completely quantified or the complete set of fossil fuel support measures may not have been exhaustively identified.
Source: Ministerio de Hacienda de Costa Rica; OECD (2022), *Inventory of Fossil Fuel Support Measures* (database).

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The government also introduced a temporary subsidy targeted at low-income households that receive other social benefits (*Bono inflación*). Increasing this temporary allowance is a more cost-effective and equitable way to shield the population most affected by rising prices (OECD, 2023[1]). More generally, as indicated by the PND 2018-20, Costa Rica should progressively eliminate fossil fuel subsidies, which run counter to energy efficiency and GHG emission mitigation objectives.

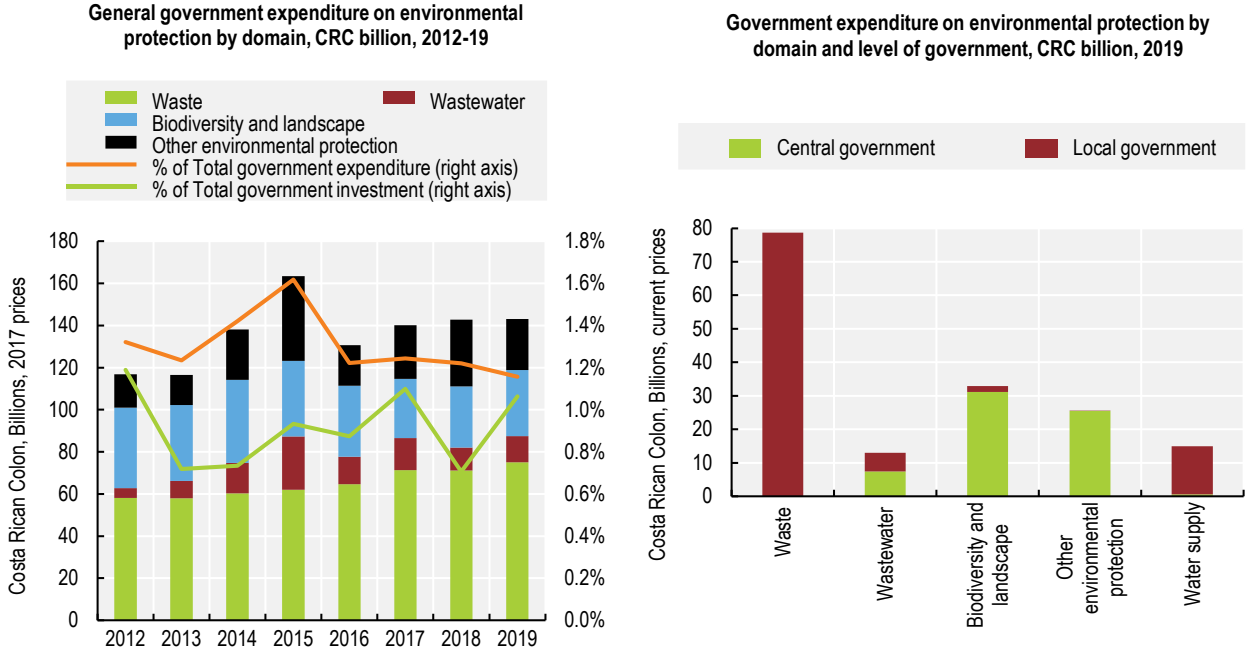
2.6. Investing in the transition to a green and decarbonised economy

2.6.1. Public environment-related expenditure

Public spending on environmental protection averaged 0.4% of GDP and 1.2% of general government expenditure in 2012-19 (Figure 2.7).[12] Most spending went to waste management and, to a lesser extent, biodiversity. Spending on waste management increased during the period, accounting for more than half of government environmental spending in 2019. After a decline, expenditure for protecting biodiversity and landscape increased in 2017-19 to 22% of total public environmental spending. However, this was still

18% below the 2012 level. More than half of public environmental expenditure (57% in 2019) occurs at local level, largely for waste management. Local governments execute all capital spending in the waste and wastewater sectors, as well as in water supply infrastructure. Central government current and capital spending focuses on biodiversity and landscape protection (Figure 2.7).

Figure 2.7. Government spending for environmental protection focuses on waste and biodiversity



Note: Government expenditure on environmental protection includes current expenditure and capital investment devoted to activities to prevent, reduce and eliminate pollution and degradation of the environment, e.g. pollution abatement (air, water, soil and noise), waste and wastewater management, and biodiversity protection, as well as research and development, education and training.
Source OECD (2023), "General Government Accounts, SNA 2008 (or SNA 1993): Government expenditure by function", *OECD National Accounts Statistics* (database).

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About 95% of spending in environmental protection is current expenditure. Government investment in environmental protection hovered around 1% of total government investment in 2012-19 (Figure 2.7). Investment has been insufficient to provide adequate waste and wastewater infrastructure (Chapter 1). Similarly, transport infrastructure is of generally poor quality (OECD, 2023[1]), although it has absorbed most of the public infrastructure investment in the last decade (CONARE, 2022[2]). Transport investment has gone largely towards extending the road network, neglecting its maintenance, as well as public transport. Roads are mostly not safe for walking and cycling due to lack of sidewalks and bicycle lanes (Chapter 1).

Overall, deteriorating public finances have limited capital investment in Costa Rica in the last decade (CONARE, 2022[2]). There is a need to reallocate resources to address gaps in environment-related and low-carbon infrastructure, improve service delivery to a growing population and enhance resilience of infrastructure to climate change impacts. The PNDIP 2023-26 plans to invest in the GAM rapid passenger rail service, with the support of international donors. However, it also continues to focus on extending the road network and does not foresee investment in the EV charging network, or cycling and walking infrastructure. Limited investment is planned in energy efficiency, waste management or diversification of renewable energy sources.

The transition to a green and decarbonised economy requires large-scale investment. Financial needs for implementing the PND are estimated at USD 5 billion for 2021-25 (7% of GDP), mostly for investment in the transport and waste sectors. Speeding up the PND investments would boost economic recovery and employment (Groves and et al., 2022[30]). At longer term, achieving a decarbonised and digital economy could create 135 000 net jobs by 2050 (equivalent to 5% of the 2021 labour force), mainly related to clean energy, sustainable transport and efficient use of natural resources (Quirós-Tortós et al., 2022[31]).

In addition to being scaled up, public environment-related investment should be made more efficient. Costa Rica's well-developed National Public Investment System (SNIP) aims to improve and harmonise project selection across the public sector. However, the institutionally decentralised sector and the autonomous agencies have their own budget process (separate from the central government budget process). Consequently, only part of the public investment by autonomous institutions is reported to the SNIP. For that reason, less than half capital expenditure is estimated to be reported in the SNIP (OECD, 2021[4]). On average, only 30% of the budgeted capital spending is used (OECD, 2023[1]).

Further improving capacity to execute capital investment projects will require stronger accountability mechanisms, transparency and impact evaluation. MIDEPLAN issued regulations and guidelines to integrate climate mitigation and adaptation considerations into the SNIP. It has also started implementing a taxonomy of sustainable infrastructure. Costa Rica has defined standards for using cost-benefit analysis but in practice has made little progress in using them to select projects (OECD, 2020[32]). Implementing green budgeting practices would help the government align public expenditure, as well as revenue, with climate and other environmental goals.

2.6.2. Financing environment-related and low-carbon investment

Given the limited fiscal space, more private participation in infrastructure projects is needed. Concessions and public-private partnerships (PPP) can help in this respect. So far, most of the concession contracts have had long execution delays. Costa Rica's PPP legal framework is aligned with OECD standards, but inefficiencies remain (OECD, 2021[4]). In 2014, the Ministry of Finance established a unit to oversee PPP contracts. The National Concessions Council, a subsidiary body of the Ministry of Public Works and Transport, manages concession contracts. The coexistence of two different authorities to manage concessions and PPPs, respectively, creates inefficiencies and reduces transparency (OECD, 2021[4]). There is also a need to improve the PPP implementation capacity of the administrations. Thorough assessment of projects, adequate specifications of the contracts and proper fiscal accounting are crucial to maximise value for money of PPPs and limit risks for public finances (OECD, 2023[1]).

Costa Rica's long-standing environmental commitments place the country in a favourable position to access international green finance, including through green, social, sustainability and sustainability-linked (GSSS) bonds.[13] A successful issuance of green bonds (USD 504 million) by a Costa Rican state-owned bank in 2016 indicates this is a viable source of financing for the government (OECD, 2023[1]). This issuance brought Costa Rica among the ten largest LAC issuers of GSSS bonds on international markets (as measured by the cumulative bond value issued in 2014-22) (CBI, 2023[33]). The experience of Colombia shows that sovereign green bonds in local currency could help mobilise finance from private and institutional investors in the domestic market (OECD et al., 2022[34]). The country could also consider developing so-called catastrophe bonds to provide insurance against losses caused by natural disasters and finance investment in adaptation to climate change. Work is ongoing to develop official government guidance to access finance from the Green Climate Fund.

The General Superintendence of Financial Institutions developed a methodology to assess climate-related financial risks of the country's banks and financial institutions. A systematic application of this assessment methodology would enhance transparency and provide incentives for redirecting finance towards cleaner activities. Costa Rica would benefit from joining other LAC countries, like Brazil and Colombia, in developing and harmonising GSSS bond standards, corporate sustainability standards and taxonomies

that identify activities and investment that contribute effectively to the green transition (OECD et al., 2022[34]).

2.7. Encouraging green business practices

2.7.1. Environmental protection expenditure of private enterprises

According to a BCCR survey of 272 companies, businesses spent some CRC 40 billion (USD 68 million) or 0.1% of GDP in 2019 for preventing or mitigating pollution and environmental degradation (BCCR, 2022[35]). This compares with CRC 150 billion (USD 255.41 million) in government environmental protection expenditure in the same year. Business expenditure declined markedly in 2020 with the COVID-19 pandemic. In 2018-20, businesses spent less than 1% of their total expenditure on environmental activities. About half of spending went to managing waste. The other major spending categories include controlling air emissions (13%) and other environmental activities such as obtaining environmental certification (17%). On average, 83% of spending is for current expenditure. The limited investment focuses on curbing emissions of air pollutants and GHGs. Manufacturing companies are those that invest the most. About 1 000 people per year were employed to conduct environment-related activities in companies in 2018-20, especially in the manufacturing and services sectors (BCCR, 2022[35]).

2.7.2. Voluntary approaches

Costa Rica has developed several measures to encourage businesses to engage in environment-friendly activities and investment, in line with its 2018 National Policy for Sustainable Production and Consumption. These include voluntary agreements, environmental business certifications and product labels. Since 2018, MINAE has been implementing the Programme of Voluntary Agreements for Cleaner Production (AVP+L). As of 2022, four companies have entered these agreements with MINAE, all in the agro-food sector. As part of the programme, the ministry has also conducted environmental training, technical assistance and audits for several companies.

According to the BCCR survey, 65% of companies had some form of environmental certification in 2018-20, mostly under the Country Programme for Carbon Neutrality (PPCN), the Ecological Blue Flag Programme (PBAE) and Essential Costa Rica (BCCR, 2022[35]). The PPCN certifies companies that voluntarily track, reduce and compensate their direct and indirect GHG emissions. The Institute of Technical Standards (INTECO) releases five levels of certification corresponding to the extent of the companies' climate mitigation actions. As of end 2022, 120 companies had been certified "Carbon Neutral". Overall, since 2012 more than 200 companies, 21 municipalities and 2 districts have engaged in the PPCN. The PBAE was launched in 1995 to recognise beaches that met certain ecological criteria. Its scope has been progressively extended to include a "climate change" category for industrial companies that reduce energy and water use, improve their water management and engage in reforestation (among other activities). In 2019, around 400 private organisations were granted the Ecological Blue Flag certification. Costa Rica's country brand Essential Costa Rica, in operation since 2013, also includes an environmental component, among several others. Companies or products can use the brand following a licensing protocol. The dimensions associated with the environmental component include energy efficiency, air emissions, water use and waste management (OECD, 2023[13]).

In 2019, MINAE started implementing its environmental and energy labels for products and services. INTECO approves the requirements for obtaining the labels, which are aligned with international standards. Costa Rica aims to have the labels recognised by mutual approval agreements with other countries in the region. As of February 2023, only two products had received the MINAE environmental label (a bottled water and a beer). There are also sector-specific labels and certifications, such as the Good Agricultural Practices Label, the *Pura Vida* label for sustainably caught and processed fish and seafood, the

Certification for Sustainable Tourism and the *Distintivo ABS* for products using the country's genetic resources (Chapter 3). This multitude of business certification programmes and product labels risks creating confusion for customers and investors, and generating "greenwashing". Costa Rica would benefit from strengthening and harmonising the criteria for certification of organisations and products.

2.7.3. Green public procurement

With large spending on public procurement (12.5% of GDP in 2018), expanding green public procurement (GPP) can greatly help raise demand for cleaner products and services, thereby stimulating entrepreneurship, innovation and job creation in green industries. For instance, GPP can foster the creation of markets for recovered and recycled materials (Chapter 1). In 2015, Costa Rica was the first LAC country to adopt a National Policy for Sustainable Public Procurement, followed by technical regulations setting environmental criteria for public purchases of several items and services. As of 2020, sustainability criteria also apply to building construction or renovation works procured by public institutions. GPP is part of each public institution's mandatory environmental management programme.

However, results have been modest, largely because the overall public procurement system is still fragmented and inefficient. The use of the electronic public procurement system became mandatory in 2016, but its uptake remains incomplete (OECD, 2023[1]). The new law establishing that all public institutions must carry their purchases through the central procurement system is a welcome step. Its full implementation has the potential to boost the effectiveness of GPP.

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Notes

[1] These other institutions include: the Costa Rican Tourism Board – the tourism promotion and development agency – which also oversees the maritime terrestrial zone, including land-use planning in coastal areas; the Costa Rican Institute of Fishing and Aquaculture, which regulates and manages fishing and aquaculture and is responsible for the conservation and rational use of biological marine resources and species; and the National Agency for Groundwater, Irrigation and Drainage Service, which oversees the use of water resources and plans and develops irrigation and drainage infrastructure to support agriculture.

[2] The other ministers composing the National Environmental Council are those in charge of economic planning, health, agriculture, education, science and technology, and housing and human settlements.

[3] The Local Governments National Union, which gathers nearly all municipalities of the country, and the National Association of Mayors and Intendentes.

[4] The plenary committee comprises the National Farmers Group, the National Indigenous Group, National Council of Rectors, the Costa Rican Federation for the preservation of the Environment and the Costa Rican Union of the Chamber of Private Enterprises.

[5] The PSF, valid for five years, certifies compliance of the operations with several issue-specific environmental regulations without setting any additional conditions.

[6] BATs are "advanced and proven techniques for the prevention and control of industrial emissions and the wider environmental impact caused by industrial installations, which are developed at a scale that enables implementation under economically and technically viable conditions" (OECD, 2020[36]).

[7] MINSA regional offices monitor compliance with PSFs in accordance with an inspection plan that prioritises facilities with high environmental and health risk. SETENA monitors compliance of the projects and activities with VLAs. It can suspend activities, works or projects in cases of infringements to the environmental legislation and recommend actions to minimise environmental impacts. The Water Directorate visits sites to verify the information submitted by operators in their wastewater discharge permit applications.

[8] OECD (2022[18]) defines the Effective Carbon Rate (ECR) as the total price that applies to CO_2 emissions from energy use as a result of fuel and carbon taxes (net of exemptions and discounts) and emissions trading. The net ECR is the ECR diminished of pre-tax budgetary support to fossil fuels.

[9] For comparison, Euro 6 standards have been in force in the European Union since 2014 and Tier 3 standards have been in force in the United States since 2017.

[10] Vehicles with the licence plate ending in 1 or 2 cannot enter the area within the San José ring road on Monday; those with licence plate ending in 3 or 4 cannot circulate on Tuesday, and so on. If a household owns two or more vehicles under restriction on the same day, they can transfer the restriction to the following day for one of the vehicles. The fine for non-compliance is slightly higher than CRC 26 000 (about USD 47).

[11] Car owners can purchase daily, monthly or six-month permits to circulate at restricted times, with the permit prices depending on the fuel used, engine size and vehicle weight as proxies for air pollutant emissions.

[12] This analysis is based on the Classification of the Functions of Government of the OECD National Accounts Statistics. Spending on environmental protection includes current expenditure and capital investment devoted to activities to prevent, reduce and eliminate pollution and degradation of the environment, e.g. pollution abatement (air, water, soil and noise), waste and wastewater management, and biodiversity protection, as well as research and development, education and training.

[13] Green bonds imply a commitment to use the funds raised exclusively to finance or re-finance green projects, business activities or assets.

Chapter 3. Biodiversity conservation and sustainable use

A megadiverse country, Costa Rica is known globally for its success in reversing deforestation. The country's extensive protected area network and pioneering programme of payments for ecosystem services have helped reduce biodiversity loss and extend forests' carbon sequestration capacity. However, more should be done to tackle pressures on biodiversity from development of infrastructure and settlements, tourism, farming and fishing. This chapter discusses Costa Rica's progress in preserving its rich ecosystems and species. It reviews the legal, strategic and institutional framework, as well as the policy and financing instruments for biodiversity conservation and sustainable use. Finally, this chapter assesses how biodiversity considerations have been mainstreamed into tourism, agriculture and fishing policies.

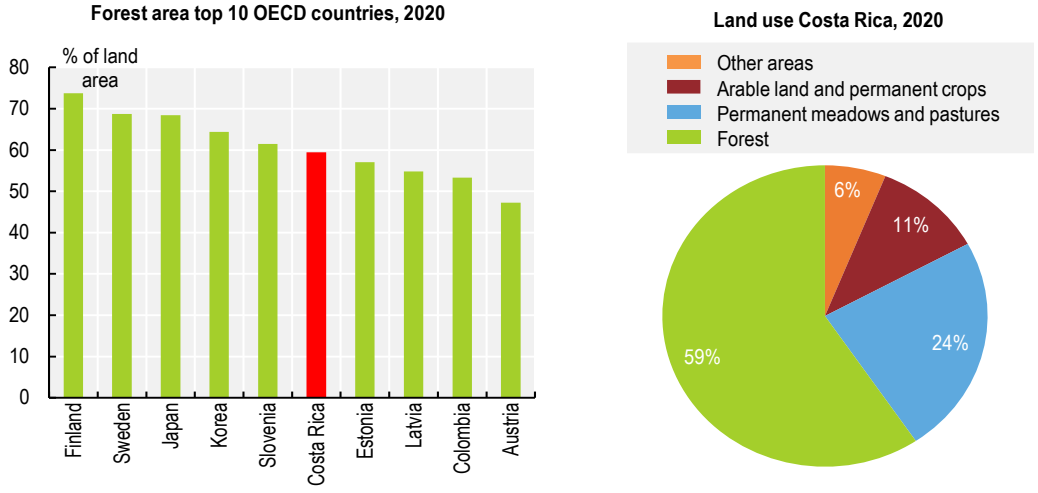
3.1. Introduction

Costa Rica is a megadiverse country whose biodiversity supports the country's florid nature-based tourism, productive agriculture and artisanal fisheries. The natural environment is deeply rooted in the national cultural identity. Globally, Costa Rica is renowned as the first tropical country to reverse deforestation. This is partly the result of a mix of targeted policies, including a ban on mature forest clearing, a nationwide programme of payment for ecosystem services and a network of protected areas, which will all be discussed in this chapter. The country has a wide-ranging policy framework for the conservation and sustainable use of biodiversity, in recognition of its key economic and social role. However, there is scope to strengthen policy coherence, implementation and effectiveness to tackle persistent pressures on biodiversity.

3.2. Status, trends and pressures

Costa Rica is home to about 6% of the world's known species and hosts a large variety of terrestrial, freshwater and marine ecosystems. It has a small terrestrial area of 51 100 square kilometres (km^2), with a 1 254 km-long coastline on the Pacific Ocean and a shorter Caribbean coastline. It has an extensive marine area, more than ten times larger than its territory on land. The country boasts one of the ten largest forest coverages in the OECD. About 35% of land is used for agriculture (Figure 3.1).

Figure 3.1. Forests cover a large share of Costa Rica land area



Source: OECD, "Land resources: Land use", *OECD Environment Statistics* (database), https://doi.org/10.1787/8ecc9c9c-en.

StatLink https://stat.link/m89bg3

Infrastructure development, urbanisation, tourism, farming, fishing, untreated wastewater, pollution and climate change are the main drivers of biodiversity degradation in Costa Rica. The conservation status varies across regions and ecosystems. The northern areas of the country, from the Pacific to the Atlantic coasts, are those facing the most cumulative pressures. The ecoregions with more pressures per area are mangroves in both the Pacific and Caribbean coasts, tropical humid forests of the Atlantic Isthmus and the Central American dry forests. The best conserved ecosystems are found in steep slope mountain areas and flood plains, which are usually found in officially protected areas (MINAE et al., 2018[1]).

Climate-related extreme weather events, such as floods, droughts and coastal storms (Chapter 1), degrade and fragment the ecosystems and make them more vulnerable to the impact of a changing climate. Impacts on biodiversity include changes in distribution, composition and growth rates of forest ecosystems; changes in water bodies; sea level rise; coastal erosion; sedimentation; declines in the geographic range and reproductive capacities of species (mainly amphibians, reptiles, birds and bats); temporal and spatial imbalances in the distribution of marine species; and food availability (MINAE, 2015[2]).

3.2.1. Terrestrial ecosystems

The country's terrestrial ecosystems include dry forests, tropical rainforests, paramos, mangroves and other wetlands, covering more than half of the national territory.

Forest ecosystems

Costa Rica is one of the three countries in Latin America and the Caribbean (LAC) that increased forest cover since 2000 (Figure 8 in Assessment and recommendations). After decades of rampant growth, deforestation started to slow down with the collapse of the beef market in the 1980s, as well as the progressive internal migration to cities and the development of tourism (Ardila et al., 2020[3]). Regulatory and incentive-based policies supported the reforestation and afforestation of the country (Sections 3.5 and 3.6). Today, forests cover 59% of the country's land area (Figure 3.1), up from an all-time-low of 21% in 1987 but still far from 75% of 1940. About half of Costa Rica's forested area is under some form of protection. A quarter is in the official network of protected areas and another quarter is private land included in biological corridors. Most of the remaining mature forest is in officially protected areas, often in inaccessible regions, although some remain exposed to illegal clearing (Section 3.5).

Reforestation and regeneration rates vary across types of forests and regions. Dry forests have benefited from high recovery rates, while humid and cloud forests show low to moderate deterioration levels (MINAE et al., 2018[1]). Forest recovery is mainly the result of reforestation of ancient forest areas that had been converted into pastures and croplands over the previous decades. Regrowing forests are cleared on average within 20 years. Secondary forests on abandoned agricultural lands are ecologically different from the original forest of a site. These dynamics have led to substantial forest and habitat fragmentation. Forest fragmentation and logging degrade forests, reducing their contribution to climate change mitigation goals and possibly reducing their resilience (Ardila et al., 2020[3]).

As in other countries, Costa Rican forests are exposed to multiple pressures. Climate change and temperature extremes are affecting forests, some of which have stored carbon that might be released (Chapter 1). In 2019-20, about one-third of the country's forest-covered areas was exposed to very high or extreme wildfire danger (IEA/OECD, 2023[4]). Land conversion from forests to pastures, crops and urban use declined considerably in the first half of the 2010s. However, evidence suggests that it grew in the second half of the decade (CONARE, 2021[5]). The highest pressures are on areas closer to the so-called agricultural frontier, with high road accessibility, proximity to urban communities, lower land prices and lower socio-economic development.

Wetlands

Wetlands, including mangroves, have been severely deteriorating due to the eutrophication processes induced by residual fertilisers, as well as because of waste and wastewater pollution, sedimentation and salinisation. Many wetlands are located on private properties, which exacerbates their risk to be affected or drained for productive activities. National conservation strategies have primarily focused on the upper and lower parts of watersheds leaving out the middle sectors with the greatest alterations (MINAE

et al., 2018[1]). Costa Rica is home to 12 internationally recognised wetlands under the Ramsar Convention totalling about 570 000 hectares (ha). It has requested the designation of additional sites (35 000 ha).

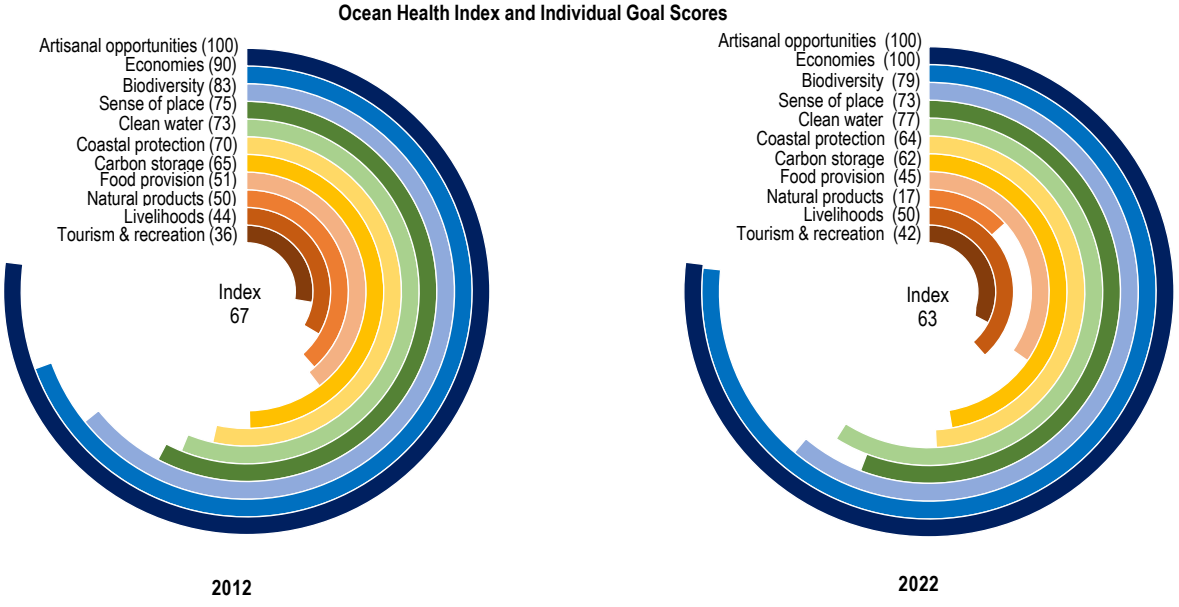
3.2.2. Coastal and marine ecosystems

The long coastlines in the Caribbean and in the Pacific result in a wealth of coastal marine ecosystems, including coral reefs, mangroves, seabed coastal ecosystems, sandy and rocky beaches, seagrass meadows and estuaries. Costa Rica has around 670 000 ha of coral formations on both Pacific and Caribbean coasts, hosting 59 different species of reef-forming corals (which represent 7.4% of global diversity) (MINAE et al., 2018[1]). More than two-thirds of the coral formations are within protected areas.

Only 5% of Costa Rica's population live in coastal areas. Still, human pressures are high and include unsustainable exploitation of natural resources associated to poverty, unsustainable fishing practices (Section 3.10) and uncontrolled development of tourism-related infrastructures and buildings, as well as irresponsible tourist behaviour (Section 3.8) (Moreno Díaz et al., 2019[6]). In addition, the country's topography exposes coastal and marine ecosystems to runoffs, sediments, pollution, untreated sewage and waste produced in the Central Valley (where most people live) (Chapter 1).[1] Natural phenomena, mostly the El Niño–Southern Oscillation and red tides, and climate change-induced sea level rise have already affected these ecosystems.

Knowledge about the health of marine ecosystems and species is limited. According to the Ocean Health Index (which includes environmental, social and economic criteria), the status of Costa Rica's marine ecosystems slightly worsened between 2012 and 2022 (Figure 3.2). Its score of 63 is below the global score of 69, and Costa Rica ranks 175th of 220 regions. While most dimensions of the index had no

Figure 3.2. The Ocean Health Index indicates pressures on Costa Rica marine resources



Note: The maximum possible score for each goal and index is 100. Lower scores indicate that more benefits could be gained or that current methods are harming the delivery of future benefits.
Source: Ocean Health Index, (2022), ohi-global version: Global scenarios data for Ocean Health Index, National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara, https://github.com/OHI-Science/ohi-global/releases (accessed 15 March 2023).

StatLink https://stat.link/6e94c2

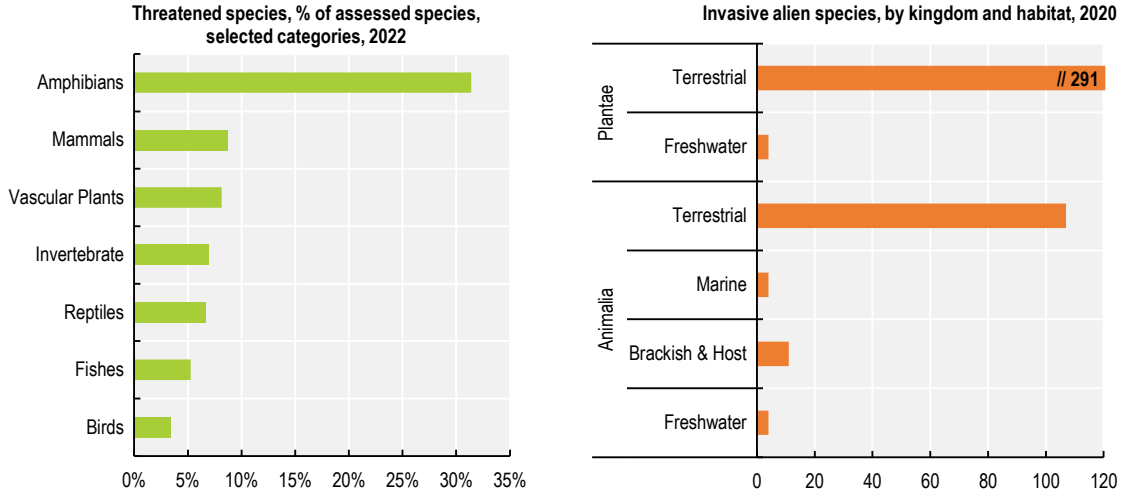
unsustainable exploitation of marine fish resources (Section 3.10) (Ocean Health Index, 2022[7]). Populations of many cartilaginous fish (like sharks and rays) are in decline. They are considered the marine group most directly impacted and threatened by human activities (MINAE et al., 2018[1]). Costa Rica has not assessed the biological sustainability status of commercial fish stocks (OECD, 2022[8]).

3.2.3. Threatened species

Costa Rica is home to more than 120 000 species, including some 7 000 marine species (MINAE et al., 2018[1]). The country's tropical rainforest areas host the largest number of species, many endemic. About three-quarters of the reported marine species can be found in the Pacific waters. Despite improved regulations, the extraction, transport, trafficking, trade and possession of species continue.[2]

About 7% of Costa Rica's species are threatened. While this is relatively low compared to other megadiverse countries, the number has been increasing since the late 1990s. The number of threatened species included in the IUCN Red List and present in Costa Rica grew from 291 to 567 between 2011 and 2021. Most of the increase is due to improved knowledge (CONARE, 2022[9]). The most threatened group is amphibians, followed by mammals and vascular plants (Figure 3.3). Bird populations have diminished. More than 3% of known bird species are threatened in the country. In dry forests, logging, wildfires and poaching have endangered populations of large mammals such as jaguars, pumas, tapirs, ocelots and peccaries (MINAE et al., 2018[1]). Several invasive alien species exert pressures on the country's biodiversity, especially on land (Figure 3.3). They can out-compete native species for space and resources, be predatory to native species and/or introduce disease. They can also cause economic harm by damaging agricultural production, forestry, fishing and water supplies (OECD, 2018[10]).

Figure 3.3. Nearly a third of known amphibian species are threatened and invasive species exert pressures on terrestrial habitats



Note: Mosses have the highest percentage of threatened species (50%), but they are not included since their representation is relatively small compared to other species.
Source: OECD (2022), "Threatened species", *Environment Statistics* (database); (GRIIS, 2020), Base de datos Mundial sobre especies introducidas e invasoras.

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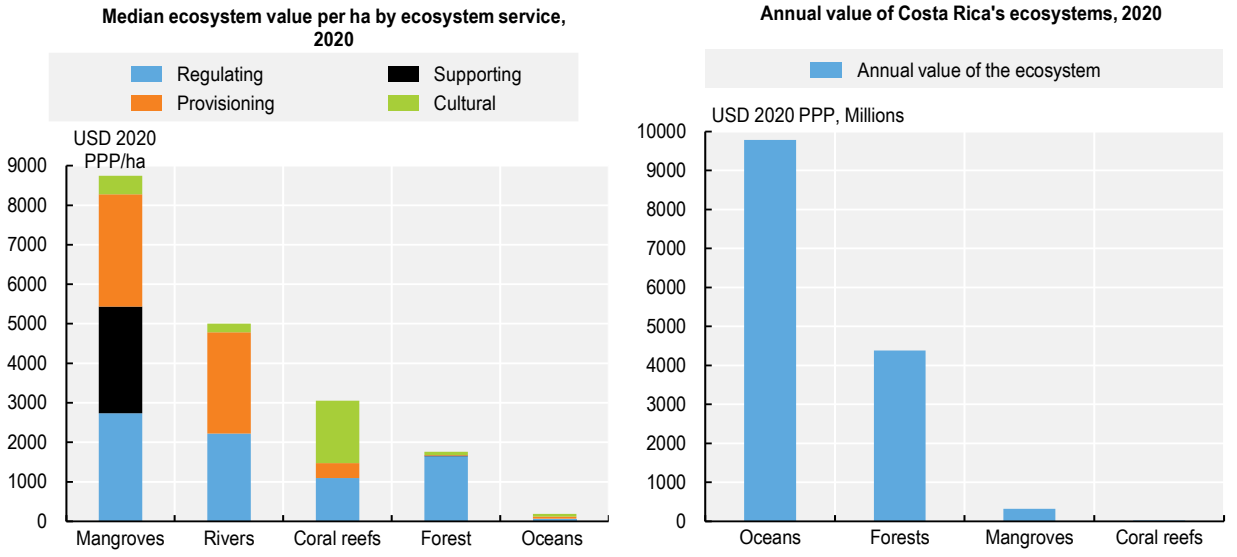
3.2.4. Economic valuation and ecosystem services

Costa Rica's numerous and diverse ecosystems provide several services to the country's population and economy. The country's natural capital is estimated at no less than USD 15 billion per year, equivalent to 23% of gross domestic product (GDP) in 2019 (Hernández-Blanco and Costanza, 2021[11]).[3] More than 40% of this value arises from cultural services such as recreation and tourism; regulating services – such as climate regulation, erosion prevention and pollination – generate some 37% of the total ecosystem service value. These are followed by provisioning services (e.g. food and water) and supporting services (providing habitats for species). The evaluation of ecosystem services should guide the revision of the Programme of Payment for Environmental Services (*Programa de Pago de Servicios Ambientales, PPSA*), allocation of financial resources and policy making more broadly (Sections 3.6 and 3.7).

Hernández-Blanco and Costanza (2021[11]) estimate that mangroves are the ecosystems that provide the highest economic benefits to society per hectare, followed by rivers and coral reefs. Nevertheless, when considering their total area, oceans are the most valuable ecosystems in Costa Rica (Figure 3.4). There is a significant variation in the value of services provided by different ecosystems. Most of the value of forest ecosystems comes from regulation services. Pollination is the most valuable regulation service, followed by erosion prevention and climate regulation. The provision of biological and genetic resources (e.g. for production of pharmaceuticals), support for species life and erosion prevention are among the most valuable services provided by mangroves. In the case of coral reefs, the most valuable services are tourism and recreation.

Figure 3.4. Mangroves are the ecosystem that per hectare provides greatest economic benefit, while oceans are the most valuable ecosystem



Source: (Hernández-Blanco and Costanza, 2021[11]).

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3.3. Setting the governance for biodiversity management

In the mid-1990s, Costa Rica overhauled its institutional and legislative frameworks for biodiversity conservation. This move aimed to halt deforestation, recover lost forests and promote economic activities based on the sustainable use of biodiversity. The 1996 Forestry Law and 1998 Biodiversity Law introduced a ban on mature forest clearing, the nationwide PPSA and a governance system for integrated natural resource management based on conservation areas. These, together with the 1992 Wildlife Conservation Law and the network of protected wilderness areas (*Áreas Silvestres Protegidas*, ASPs), remain the pillars of the country's policy to combat deforestation and manage ecosystems and species.

3.3.1. Institutional setting

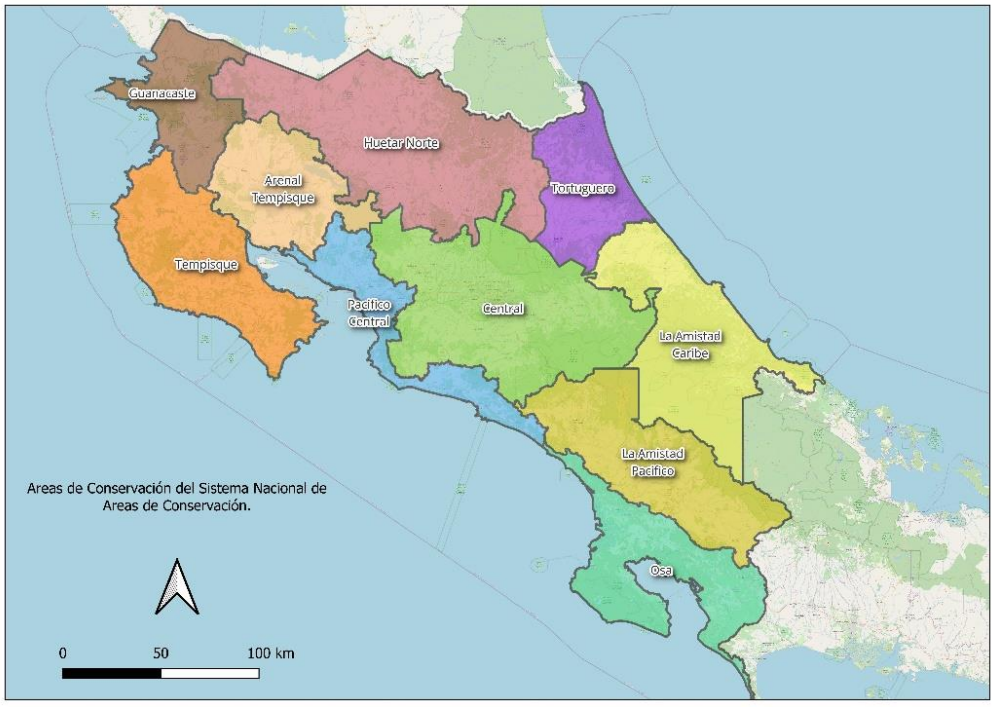
As in other sectors of Costa Rica's public administration, several institutions at central and subnational levels share responsibilities over biodiversity management together with the Ministry of Environment and Energy (MINAE). This often creates conflicting objectives and overlapping responsibilities (Chapter 2). Three subsidiary bodies of MINAE are at the core of biodiversity governance. The National Biodiversity Management Commission (CONAGEBIO) formulates policies for the conservation and sustainable use of biodiversity, including access to genetic resources and protection of traditional knowledge associated to their use. The National Forestry Financing Fund (FONAFIFO) finances afforestation and reforestation and manages the PPSA. The National System of Conservation Areas (SINAC) oversees the ASPs and is tasked with the integrated management of natural resources within and outside protected areas.

Costa Rica adopted a unique approach to multi-level governance for natural resource management. The country's territory is organised into 11 jurisdictions – called conservation areas – for the integrated management of the ASPs and natural resources (forest, wildlife and water). The boundaries of conservation areas contour the ASPs and their areas of influence and interactions, thereby differing from the borders of the country's seven provinces (Figure 3.5). A multi-stakeholder body – the Regional Council of Conservation Areas – is the decision-making body of each conservation area. The National Council of Conservation Areas – the governing board of SINAC – co-ordinates biodiversity policy design and implementation between the national level and all conservation areas.[4] There are also local councils for conservation areas, as well as other territorial multi-stakeholder bodies for biological corridors and watershed committees. Despite the original ambition, SINAC and the conservation areas have largely focused on managing the ASPs and biological corridors rather than on integrated natural resource management (Castillo and Soto Navarrete, 2017[12]).

3.3.2. The policy framework

Costa Rica has proactively engaged in international fora related to various aspects of biodiversity conservation and sustainable use, primarily the UN Convention on Biological Diversity (CBD).[5] The National Biodiversity Policy 2015-30 and the National Biodiversity Strategy 2016-25 and Action Plan (ENB2) are the main documents guiding the country's biodiversity policy and are aligned to the country's international commitments. A wide array of biodiversity-related strategies and programmes are also in place, such as the National Wetlands Policy 2016-25, the National Forest Development Plan, the REDD+ Strategy, the National Landscape Restoration Strategy 2021-50 and the National Bioeconomy Strategy 2020-30, just to name a few. However, ensuring policy coherence and effective implementation of the multitude of biodiversity-related programmes and policy measures, often with overlapping objectives, is a challenge. It is unclear to what extent they have yielded the expected results and at what costs. As in other Latin American countries, inadequate resources, administrative capacity and co-ordination hamper execution of plans and programmes (OECD, 2018[10]).

Figure 3.5. Eleven conservation areas are the territorial units for integrated natural resource management



Note: The map shows the conservation areas of – clockwise – Tempisque (ACT), Guanacaste (ACG), Arenal Huetar Norte (ACAHN), Tortuguero (ACTo), La Amistad Caribe (ACLAC), La Amistad Pacifico (ACLAP), Osa (ACOSA), Pacifico Central (ACOPAC), Arenal Tempisque (ACAT), Central (ACC) and the Coco Marine Conservation Area (ACMC).
Source: MINAE – SINAC (2020).

The ENB2 adopts a result-based approach. It sets 100 targets (with intermediate target to 2020), identifies the administrations responsible for achievement of each target and establishes an inter-institutional committee to monitor progress, under CONAGEBIO's leadership. Most ENB2 targets have been achieved or are on track to be achieved, including those for protected areas management, connectivity, forest cover and area under the PPSA. However, progress on some key targets has been slower. This slow progress relates primarily to the targets on enforcement of environmental legislation and spatial planning, recovery of mangrove ecosystems and coral reefs, illegal extraction and trade of species, pesticide use, knowledge of marine biodiversity and environmental education (MINAE, CONAGEBIO and SINAC, 2023[13]).

The planned revision of the ENB2 aims to align the strategy with the targets of the Kunming-Montreal Global Biodiversity Framework (GBF) for 2030. This provides the opportunity to increase the role of nature-based activities as a source of economic and social development and to address barriers to achieving biodiversity-related targets in a cost-effective way. The updated strategy should bring the multitude of biodiversity-related programmes and policy measures into a coherent framework and identify concrete actions to mainstream biodiversity considerations in agriculture, fisheries, tourism and spatial planning policies (Sections 3.4, 3.8, 3.9 and 3.10). It should also consider how to reduce institutional fragmentation, which hinders implementation and risks increasing the costs of achieving targets. Increasing cost effectiveness is even more crucial given the fiscal constraints Costa Rica is likely to face in the years to come. Further improving knowledge and data, particularly on marine and freshwater ecosystems, is essential to build consensus around biodiversity policy, identify priorities for action and manage natural resources effectively. This is a challenge Costa Rica shares with other countries in the region (OECD, 2018[10]).

In 2015, Costa Rica adopted its ten-year strategy and action plan for the adaptation of biodiversity to climate change. Among the priority actions identified by the plan are strengthening the protected areas and biological corridor networks and incorporating biodiversity considerations in land-use plans (MINAE, 2015[2]). The subsequent National Climate Change Adaptation Plan (PNACC) 2022-26 also has a strong focus on reducing the climate vulnerability of tourism, water resources, biodiversity and forestry (Chapter 1). Nature-based solutions (NbS), including the sustainable management of forest, marine and freshwater ecosystems, are among the main lines of action of the PNACC. This is welcome, as NbS may be more cost effective and adaptable to uncertain future climate conditions than traditional approaches, such as hard defences or other "grey" infrastructure (OECD, 2018[14]). Further extending the use of NbS would provide multiple benefits, including reducing greenhouse gas (GHG) emissions and biodiversity loss, as well as creating employment and income opportunities for local communities (OECD, 2020[15]).

3.3.3. Stakeholder participation and engagement of Indigenous Peoples

Costa Rica has made remarkable progress in enhancing public participation in environmental decision making. In 2018, the government introduced the General Mechanism for Consultation of Indigenous Peoples to implement the legal obligation to consult Indigenous Peoples before implementing policies, measures and projects that can potentially affect their communities (Chapter 2). There are eight Indigenous Peoples in Costa Rica, with a population of over 100 000 or about 2.4% of the country's population. The Indigenous Peoples estimate that 16% of the country's cloud forests, 15% of wetlands and 5% of mangrove ecosystems are in the 24 indigenous territories (CONAGEBIO, 2023[16]). Forests cover 70% of the areas of the indigenous territories, with overlaps between these territories and the official ASPs (CONAGEBIO, 2023[16]; FAO and FILAC, 2021[17]).

The National Biodiversity Policy and the ENB2 aim to foster social inclusion and active citizen engagement. The ENB2 is itself the result of a broad participatory process that included Indigenous Peoples in an effective manner for the first time, through working groups and workshops. The Intercultural Dialogue Roundtables allow the indigenous organisations to make their comments and proposals. Similar arrangements for participation have contributed to improve relationships between the government and organisations working with Indigenous Peoples.

Progress has been made in identifying areas for ancestral uses, where Indigenous Peoples carry out their traditional activities such as fishing and extraction of medicinal plants. One of the ENB2 objectives is identifying the areas dedicated to biodiversity conservation and sustainable use that will be managed by Indigenous Peoples (*Áreas de Cuido*). The restrictions to resource use and ancestral activities in the ASPs have been a source of conflict with indigenous communities. There are positive examples of co-operation between institutions and indigenous communities, such as the *Raíces* incubation programme to support sustainable tourism ventures in indigenous territories.[6] There is scope to extend these experiences, as well as to further involve the Indigenous Peoples in the PPSA (Section 3.6). More resources should be devoted to engaging and empowering Indigenous Peoples.

Environmental non-governmental organisations (NGOs) provide crucial support to public institutions for the design of biodiversity policy and the management of natural resources, as well as for creating bridges between the public and the private sector. As of 2017, there were 14 international, 39 national and 29 local NGOs working in Costa Rica for the preservation and promotion of biodiversity (SINAC, 2017[18]). NGOs have been key partners for, among others, patrolling protected areas, providing veterinary services for wildlife, generating scientific knowledge and innovative conservation practices, organising education and training courses, and raising awareness. Some NGOs have been instrumental in encouraging farmers and other landowners to enrol in the PPSA and comply with its requirement in the interest of the public good (Wallbott, Siciliano and Lederer, 2019[19]) (Section 3.6). Others own and manage private protected areas or have led to the establishment of biological corridors – a key form of participatory management of biodiversity (Section 3.5).

3.4. Integrating biodiversity into land-use planning and permitting

In line with OECD standards, the legislation requires an environmental impact assessment (EIA) prior to issuing the licence for any activity, work or project that entails risks of adverse impacts on the environment, including on ecosystems and species (Chapter 2). The National Environmental Technical Secretariat (SETENA) manages the EIA procedure and issues the corresponding Environmental Viability or Licence (VLA). However, as in other countries, consideration of biodiversity impact and mitigation measures in EIA, as well as the overall effectiveness of the assessment process, can be strengthened (OECD, 2018[10]). Some weaknesses in SETENA's governance and procedures negatively affect the quality of its EIA (CGR, 2022[20]).

The lack of land-use planning has been a major indirect driver of biodiversity loss in Costa Rica. The ENB2 acknowledges the need of better integrating biodiversity into spatial planning on land and sea. Some initiatives have been taken in this direction, such as the San José Biodiver_City Project and the National Urban Environment Agenda, but it is too early to appreciate their results. A regulation to include environmental considerations within cantonal regulatory plans (PRCs) was under development at the time of writing.

There is evidence that uncontrolled land conversion continues outside protected areas, where spatial management is regulated through the PRCs (CONARE, 2021[5]). As of July 2021, 40 of the country's 82 municipalities had PRCs. Half of these plans are more than 20 years old, 60% cover only a part of the municipal territory and 70% have not undergone strategic environmental assessment (which is required to obtain the VLA) (Chapter 2). Only four PRCs integrate vulnerability to hydrogeological risk, which is expected to increase with climate change (Chapter 1). Overall, this results in a quarter of all construction occurring in areas without an adequate land-use planning instrument (CONARE, 2021[5]). About 30% of municipal construction works are undertaken without a building permit (CONARE, 2020).

Much of the new infrastructure and building development linked to tourism occurs in coastal areas, while 85% of the few adopted PRCs in these areas lack a VLA (CONARE, 2021[5]). Many of the country's maritime terrestrial zones (ZMT) have experienced illegal development and buildings, which has threatened marine-coastal ecosystems, as well as the quality of tourist attractions. The absence of marine spatial plans exacerbates cumulative pressures on coastal zones. In 2009, the Costa Rica Tourism Board (ICT) and the National Housing and Urbanism Institute (INVU) released methodological guidelines to support coastal municipalities to develop integrated management plans for the ZMTs (ICT, 2022[21]). However, administrative capacity in coastal municipalities is even weaker than in the rest of the country, as these areas are sparsely populated, and with higher-than-average unemployment and poverty. A fragmented regulatory framework, weak interinstitutional co-operation, little participation of local communities and strong pressures from interest groups have further impeded the effective development and use of ZMT plans (Moreno Díaz et al., 2019[6]). In response to these challenges, in 2022, the government established an interinstitutional technical group for the revisions and approval of cantonal and coastal regulatory plans.

There is an urgent need to complete spatial planning and mainstream biodiversity in it, in line with GBF Target 1.[7] Costa Rica could consider adopting zoning processes for environmentally vulnerable areas outside the ASPs. For example, Brazil has been implementing ecological-economic zoning (ZEE) since 2002 (OECD, 2015[22]). ZEE is a landscape-scale planning and management tool to allocate compatible activities in defined environmental areas, with a view to using their natural resources sustainably.

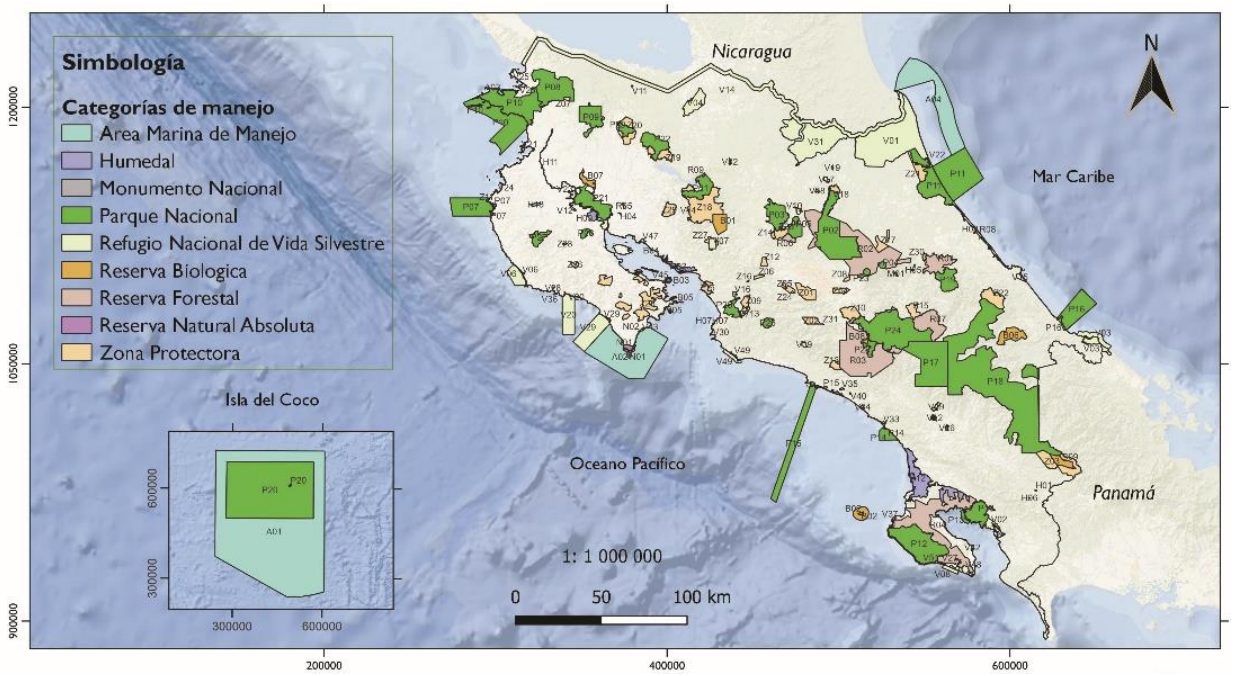
3.5. Managing protected areas effectively

3.5.1. Extension and ecological representativeness of the protected area network

Costa Rica has an extensive system of protected areas, with a strong focus on forested areas. As of 2022, there were 151 ASPs, under nine management categories (Figure 3.6).[8] National parks and national wildlife refuges are the most extensive categories of terrestrial ASPs; marine management areas and national parks cover nearly all marine protected areas. Wildlife refuges are the only officially protected areas that can include privately owned land.

Figure 3.6. Costa Rica has an extensive and variegated system of protected areas

Map of the officially protected wilderness areas, 2022.



Note: Area marina de manejo = marine management area. Humedal = wetland. Monumento nacional = national monument. Parque nacional = national park. Refugio nacional de vida silvestre = national wildlife refuge. Reserva biológica = biological reserve. Reserva forestal = forest reserve. Reserva natural absoluta = absolute nature reserve. Zona protectora = protective zone.
Source: SINAC (2022), Áreas Silvestres Protegidas, Sistema Nacional de Áreas de Conservación, www.sinac.go.cr/ES/asp.

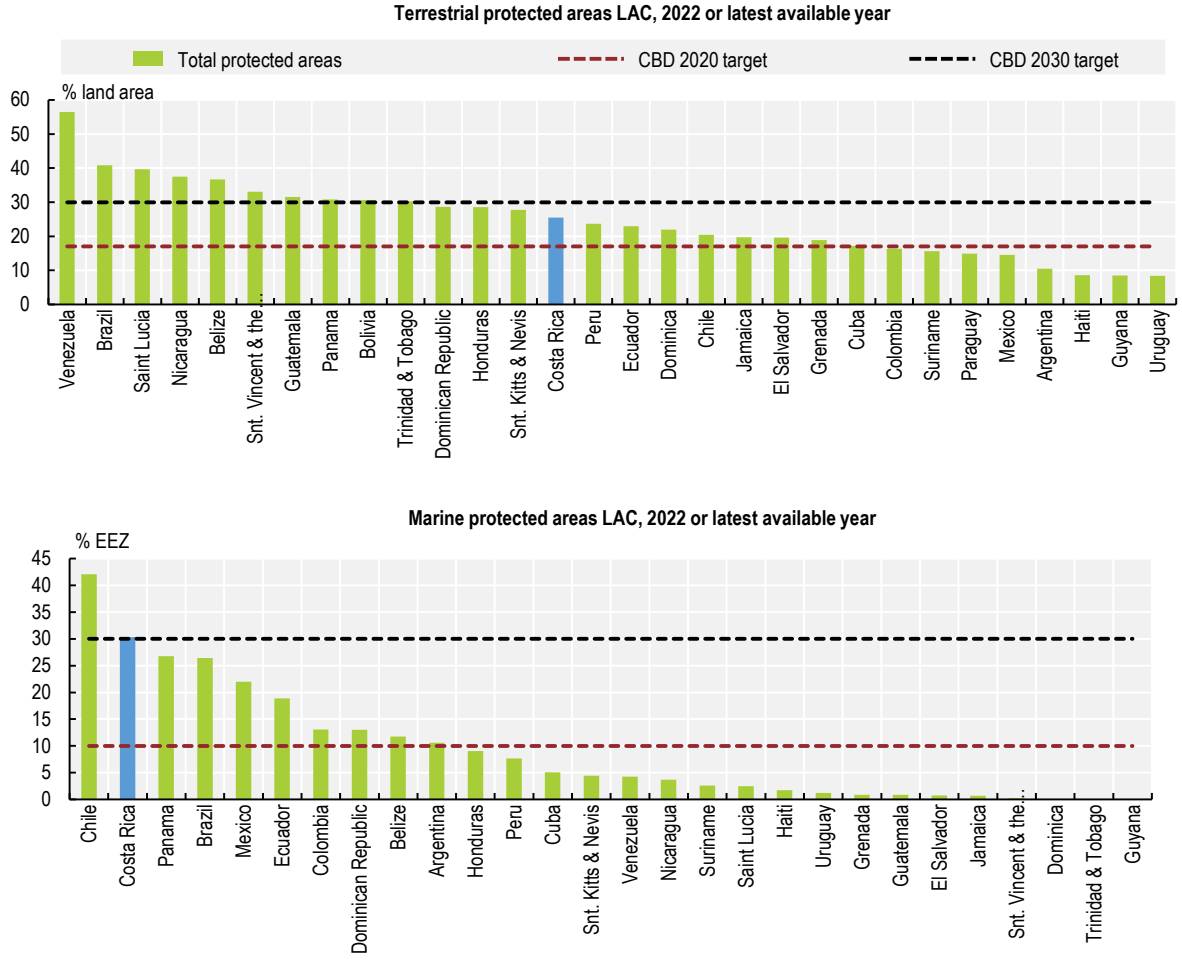
According to SINAC data, as of 2022, terrestrial ASPs covered about 25% of Costa Rica land. This is higher than many other LAC countries and above the OECD average of 16%. This is also well above the CBD Aichi Target 11 to protect at least 17% of land area by 2020. The ASPs cover a quarter of total forested land, while another quarter is in privately owned land within biological corridors. With the establishment and extension of the protected areas around Cocos Island in 2021, the share of marine protected areas jumped from less than 3% of the exclusive economic zone to 30%. This is the second highest share among LAC countries and above the OECD average of 22% (Figure 3.7).

Therefore, Costa Rica is not far from achieving the GBF Target 3 calling for 30% of each country's land and sea to be conserved through the establishment of protected areas and other area-based effective conservation measures (OECMs).[9] However, it will need to accelerate the pace of progress for terrestrial areas compared to the last decade. Indeed, the share of terrestrial protected areas has remained virtually constant since 2005. Costa Rica has not yet reported any OECMs in the world database maintained by

the UN Environment Programme World Conservation Monitoring Centre.[10] At the time of writing, the country was working on identifying OECMs and establishing a nationwide legal framework for the implementation of these measures.

Figure 3.7. Costa Rica protects a larger share of its land and marine areas than most LAC countries

Percentage of terrestrial and marine protected areas in LAC countries, 2022 or latest available year.



Note: Data for Costa Rica come from national sources. They differ slightly from data reported in the database of *OECD Environment Statistics*, which shows 26.2% of terrestrial area and 28.3% of exclusive economic zone covered by protected areas in 2022. The CBD 2020 targets are 17% for terrestrial areas and 10% for marine areas. The CBD 2030 targets are 30% for both terrestrial and marine areas.
Source: OECD, "Biodiversity: Protected areas", *OECD Environment Statistics* (database), https://doi.org/10.1787/5fa661ce-en; SINAC (2022), Áreas Silvestres Protegidas de Costa Rica (estadísticas).

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More efforts are needed to improve the ecological representativeness of terrestrial and marine ASPs in line with the GBF Target 3. As of mid-2021, all the country's eight terrestrial ecoregions were at least partly included in ASPs, with coverage ranging from 12% (dry and seasonal moist forests in the North) to 100% (Cocos Island moist forests).[11] On average, ASPs covered 44.5% of the area within all the country's terrestrial ecoregions and 27 key biodiversity areas (KBAs) (i.e. sites that contribute significantly to the

global persistence of biodiversity) (CBD and UNDP, 2021[23]). The least represented KBAs are rivers and coastal and mangrove areas on the northern Pacific and central Caribbean coasts (Figure 3.6).

With regards to marine areas, as of June 2021, the ASPs covered 16.2% of the five ecologically or biologically significant marine areas (EBSAs) present in Costa Rica. This percentage is probably underestimated as it does not consider the enlargement of the marine protected areas around Cocos Island, which sits in the Corridor Marino EBSA in the Pacific Ocean. Still, ASPs cover less than 2% of the wide and biodiversity reach Costa Rica Thermal Dome in the country's northern Pacific exclusive economic zone. The EBSAs off the Caribbean costs are better represented, with about 35% of their area within ASPs (CBD and UNDP, 2021[23]).[12]

As in all countries, there are several barriers to the enlargement or establishment of new ASPs. The cost of and procedure for buying private land are major obstacles. A financial mechanism for such purchases is still lacking, despite the objective of the ENB2. In general, establishing a new terrestrial or marine ASP requires extensive consultations with local communities, which would face constraints to their activities. They would accept ASPs only if offered the prospect of better jobs. For example, the Tortuguero National Park has generated enough tourism to offset the losses associated with reduced access to fishing grounds (Madrigal-Ballestero et al., 2017[24]).

3.5.2. Management and effectiveness of protected area

Management of protected areas has improved since the mid-2010s, although with disparities across the ASPs and management categories. Many ASPs have conducted more activities for protection and control and the demarcation of the land area under protection. Since 2010, the "Forever Costa Rica" programme – a public-private initiative in collaboration with the NGO Asociación Costa Rica por Siempre – has supported many ASPs in developing their management plans and in monitoring the state of habitats and species. However, gaps remain with respect to financial and human resources, as well as goods and services for administrative and technical functions (CGR, 2020[25]).

The development and systematic review of management plans for all ASPs and Ramsar sites should remain a priority to improve management effectiveness. As of 2020, 70% of protected areas had a management plan, up from 43% in 2010, which is in line with the ENB2 target. However, only half of protected areas have management effectiveness evaluations, below the ENB2 target of 70% by 2020. The quality and the details of management plans differ substantially across the ASPs (CONARE, 2022[9]). SINAC's Wetland Project, launched in 2014, helped define the national wetland inventory and the National Wetland Policy 2017-30. Thanks to the project, 9 of the 12 Ramsar sites have a management plan. However, only three had been approved and were under implementation at the time of writing.

The National Biological Corridors Programme aims to reduce forest fragmentation and increase connectivity between protected areas and ecosystems outside the ASPs. At the same time, it actively engages local communities in the management and sustainable use of natural resources. Local multi-stakeholder committees are the management bodies of biological corridors. At the end of 2021, 51 biological corridors covered 38% of the land area. Six interurban biological corridors have been established since the introduction of this category in 2017. All such corridors are in the Greater Metropolitan Area around San José. They aim to improve connectivity between the ASPs and landscapes within neighbouring urban areas.

However, many corridors do not have the management tools to ensure their effectiveness in halting biodiversity loss. Local management committees were in place for 35 biological corridors; 28 corridors had adopted a management plan defining the priority of actions, targets and monitoring indicators, and 19 had evaluated their management effectiveness (SINAC, 2022[26]). The areas bordering the ASPs, including biological corridors, experience the same trends in land-use change as areas with no protection beyond the usual environmental requirements such as EIA (Chapter 2). This is because spatial management

outside an ASP is a municipal competence through land-use plans. However, PCRs are often lacking (Section 3.4); even when in place they do not generally consider biological corridors and do not restrict land use or land-use change in those areas (CONARE, 2022[9]).

On the positive side, this shows that, despite some management weakness, the ASP system has controlled human pressures on land effectively. The intensity of pressures – including hunting, logging, extraction of flora and fauna, and agriculture – depends on the ASP location and management category. This is higher for the ASPs where some private activities are permitted. The ASPs in remote mountain areas are at lower risk of deforestation and other land-use changes. Nonetheless, irrespective of the management categories, land-use change is much lower within the ASPs than outside, including in biological corridors (CONARE, 2022[9]). A specific payment mechanism could be established to compensate the conservation and sustainable management efforts of communities surrounding the protected areas.

3.5.3. Financial resources for protected areas

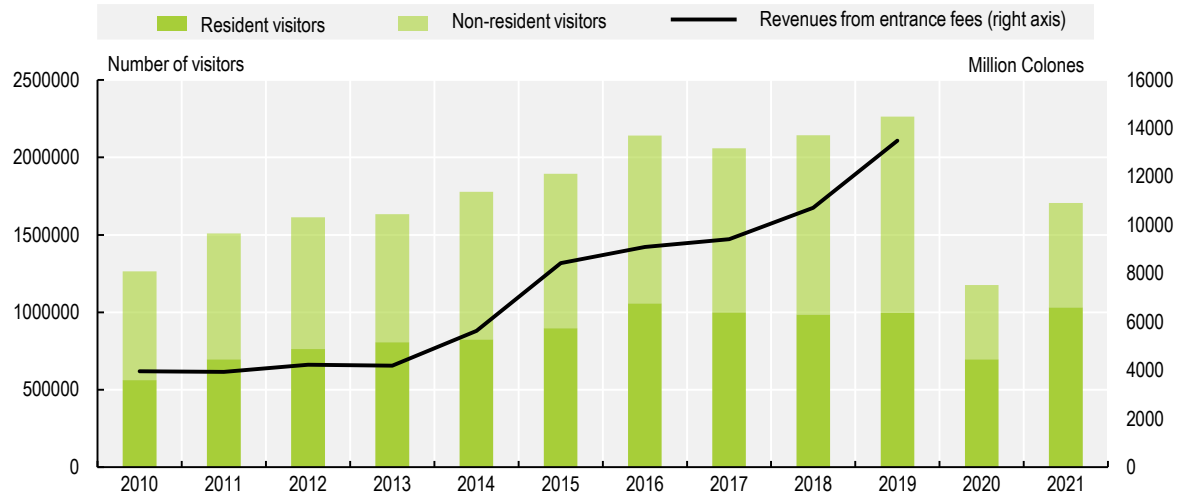
Protected areas have helped reduce biodiversity loss, while generating development opportunities and economic value. The ASPs were estimated to contribute USD 1.8 billion to the national economy in 2016, or 3% of GDP (Moreno Díaz and Villalobos Salas, 2019[27]). This is more than three times the generous estimate of biodiversity-related public expenditure (0.8% of GDP per year in 2015-20) (Molina-Escalante, 2021[28]) (Section 3.7). This indicates the high economic returns from biodiversity-related spending. About 78% of the ASP's economic contribution is related to tourism, and 14% to the provision of water for hydropower generation. The ASP system plays other important roles not considered in the estimate. Primarily, the ASPs contribute to maintaining ecosystems that provide valuable services (Section 3.2.4). These include a climate mitigation role, as forests in large national parks are among the major carbon sinks (CONARE, 2022[9]).

Costa Rica should make sure the ASPs are properly funded and staffed. Between 2015 and 2020, the SINAC budget averaged nearly CRC 40 billion (USD 71 million) and increased by about 5% per year. However, it was cut by 36% in 2021 as part of the government's fiscal consolidation efforts. SINAC needs to improve implementation, as budget execution varied between 70-85% of annual allocations (Molina-Escalante, 2021[28]). The 2022 legislative proposal to consolidate MINAE (Chapter 2) also aims to establish a trust for improving the collection and management of SINAC's financial resources. There is a need to ensure adequate human resources for the SINAC, in terms of quantity and training, including replacing a large part of staff about to retire. Due to understaffing, many activities on the ground within and outside the ASPs take place thanks to the co-operation of civil society and NGOs. For example, the National Park Volunteers Association recruits foreign volunteers to work alongside park rangers.

Fees to access the ASPs are a major source of revenue for SINAC. In 2015-19, revenue from entrance fees averaged 24% of SINAC's income. In 2011-19, this revenue increased considerably together with the number of visits to the ASPs, prior to a sharp decline in visits linked to the 2020 COVID-19 pandemic (Figure 3.8; Section 3.8). Four ASPs attract half of all visitors to protected areas and generated most of the revenue. About two-thirds of protected areas do not generate any revenue from tourism. All revenue accrues to SINAC and is redistributed to all the ASPs to help them cover their costs. The fees do not reflect visitors' willingness to pay (WTP) and the operating costs for managing increasing tourist inflows (Hernández-Blanco, Pacheco-Jiménez and Elizondo-Barboza, 2020[29]). For Costa Rica's residents, fees vary between CRC 600 and CRC 1600 (about USD 1.0-2.5) for most ASPs.[13] This is about the price range of a kilogramme of rice. As in many developing countries and emerging economies, entrance fees are much higher for foreign tourists, who pay between USD 5-15. Fees have not been updated for several years, not even adjusted to the consumer price index as required by law. This has caused substantial revenue losses. The official methodology for setting entrance fees dates to 2004 and has not been systematically implemented (Hernández-Blanco, Pacheco-Jiménez and Elizondo-Barboza, 2020[29]).

Figure 3.8. More and more visits to protected areas have generated revenue for biodiversity

Number of visitors to ASPs by origin and revenue from entrance fees (right axis).



Source: ICT (2021), Visitas de residentes y no residentes a las áreas silvestres protegidas; SINAC (2021), Presupuesto SINAC.

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There is scope to review the entrance fees to increase cost recovery, as well as to use more tourism-related fees (e.g. for diving and climbing) to raise revenue. Costa Rica should adopt a consistent methodology for fee setting, based on marginal costs and WTP, among other variables. At the very least, fees should be systematically adjusted for inflation as required by law. Increasing the fees for international tourists by just one dollar would increase revenue by 7% (Hernández-Blanco, Pacheco-Jiménez and Elizondo-Barboza, 2020[29]). Costa Rica should also assess whether its dual pricing policy is fit for purpose.Generally, the price discrimination between local and foreign tourists recognises that residents have helped establish and manage protected areas through their general taxes, while foreigners often have higher income than locals and higher WTP (Apollo, 2014[30]). However, WTP of Costa Ricans has likely increased with their per capita income. This dual policy effectively subsidises the wealthier population groups. The fees for residents could be gradually raised, with a view to converging with those for foreigners. Other forms of price discrimination based on age and socio-economic status could be introduced, as done in most OECD countries. Also, differentiating the fees between high and low seasons may help reduce pressure on fragile natural areas at peak tourism times.

The use of concessions for tourism-related services in the ASPs should be extended and made more efficient. The Biodiversity Law opens to concessions for non-essential services (SANE) in protected areas, such as restaurants, shops and parking. SANE concessions are a key tool to generate revenue (through concession fees) for the ASP system and improve the quality of tourism services, while contributing to the economic development of neighbouring communities. As of 2020, only 29 ASPs had analysed the economic viability of SANE concessions out of 61 ASPs where such concessions could be deployed. In the same year, there were only two active SANE concessions. The Office of the Comptroller General signalled some irregularities in contracts for tourism-related services, which often circumvent the bidding process required for concessions (CGR, 2020[25]). In 2021, MINAE and SINAC, with the technical support of UNDP-BIOFIN, released technical guidelines for management of SANE concessions (BIOFIN-PNUD, 2021[31]). These should be systematically implemented to take best advantage of this financing mechanism.

The private sector can help expand and finance protected areas. Costa Rica has traditionally encouraged land donations and the creation of protected areas on private land through tax incentives such as exemptions from the property tax (Fabiano and Ahmed, 2019[32]). National wildlife refuges – an official ASP category – can include private land (i.e. be set on a mix of state-owned and private land) or be established on exclusively private land. They can be established for renewable terms of 5, 10 or 20 years. In 2022, more than two-thirds of wildlife refuges were on "mixed" land, accounting for 12.5% of all terrestrial area in the ASPs. In the same year, 217 fully private reserves were outside the official ASP system and registered with the Costa Rican Network of Natural Reserves, falling short of the 2020 ENB2 target of 220. Private natural reserves cover about 2% of national territory. Several such reserves are owned and managed by NGOs, and conduct tourism activities, environmental education and scientific research. In some cases, these reserves are in buffer zones between larger state-owned protected areas, as in the case of the Monteverde Reserve (Box 3.1). Owners of private reserves or of land within national wildlife refuges can access the PPSA (Section 3.6).

Box 3.1. The Monteverde Cloud Forest Biological Reserve

The region of Monteverde has been one of the main ecotourism destinations in Costa Rica since the late 1980s. The highland region features cloud forests, coffee production and wildlife (including 100 mammal, 400 bird and 120 reptile species). The Tropical Scientific Centre – a non-governmental organisation dedicated to biodiversity research – has owned and managed the Monteverde Cloud Forest Biological Reserve since its establishment in 1972. It progressively expanded its coverage to more than 4 000 hectares. The reserve serves as a buffer zone between the state-owned Protected Zone of Arenal Monteverde and the Monteverde-Golf of Nicoya Biological Corridor.

The collaboration between the Tropical Scientific Centre and local communities has been essential for maintaining the biological richness of the reserve, while providing economic opportunities in tourism-related activities and environmental education.

Source: (Fabiano and Ahmed, 2019[32]), https://cloudforestmonteverde.com/.

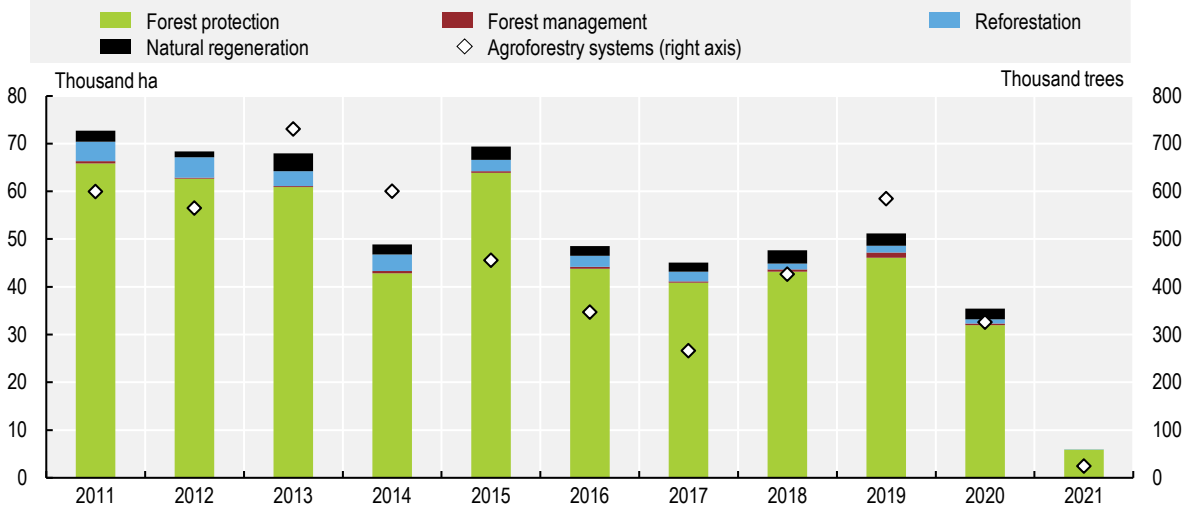
3.6. Reinforcing the programme of payment for ecosystem services

Costa Rica is a pioneer and world leader in the use of payment for ecosystem services (OECD, 2018[10]). The long-standing national PPSA, in place since 1997, has been a key driver of forest coverage growth, together with the deforestation ban and the extensive protected area network. The programme, managed by FONAFIFO, pays landowners that commit to forest conservation, reforestation, regeneration of pastures, sustainable forest management or agroforestry on their lands, thereby contributing to providing ecosystem services.[14] The PPSA recognises four forest-related ecosystem services: carbon sequestration, water provision, biodiversity (support to life and bioprospection) and natural scenic beauty.

The programme has largely contributed to restoring degraded forestlands and, to a lesser extent, preventing forest clearing (CONARE, 2022[9]). It also contributed to increase carbon sequestration (Chapter 1). Of the 1.3 million ha covered by the PPSA since its inception, more than 560 000 ha were added in 2011-21, mostly under forest conservation contracts (Figure 3.9). In the same period, nearly 5 million trees were planted under the agroforestry mechanism. Two-thirds of the new area under the PPSA is within biological corridors, and about 28% is in national wildlife refuges that include private land. Between 1997 and 2021, the PPSA has paid more than USD 600 million to small and medium producers.

Figure 3.9. Less and less area is added to the PPSA every year

Annual additional areas, by type of PPSA contract, and planted trees in agroforestry systems, 2011-21.



Source: FONAFIFO (2023), Estadísticas de PSA, www.fonafifo.go.cr/es/servicios/estadisticas-de-psa (accessed 15 March 2023).

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The programme has led to the creation of 3 500-4 000 direct jobs each year (ILO, UNEP and IUCN, 2022[33]). In so doing, it has provided income opportunities to small producers, women and indigenous communities. This is in line with the Gender Action Plan of the REDD+ strategy (Box 3.2). The PPSA could further engage women and indigenous communities. Women accounted for some 15% of beneficiaries of the new PPSA contract in 2011-21, and Indigenous Peoples for less than 2% (Figure 3.9).

FONAFIFO has been active in mobilising finance for the PPSA, through private donations, international co-operation and carbon credits produced through forest plantations and REDD+. However, the PPSA funding remains highly dependent on fuel tax revenue, which is expected to decline with the progressive decarbonisation of transport (Chapter 2). A 3.5% share of annual fuel tax receipts is ring-fenced for the programme and accounts for nearly 90% of its funds. The remainder comes from 25% of the revenue from the Water Utilisation Levy, a tax on timber value, other charges and carbon credits.

Between 2015 and 2021, the new area registered with the PPSA declined (Figure 3.9), partly due to decreasing fiscal transfers to FONAFIFO. This corresponded to a decline in reforested area per year (CONARE, 2022[9]). Since 2016, FONAFIFO has consistently received less than the amount due based on fuel tax revenue. In 2020, it suffered an additional cut due to the pandemic-related drop in fuel use and associated tax revenue. This shows vividly the impact that transport decarbonisation will have on the PPSA funding and area coverage, as well as on the capacity to monitor landowners' compliance with the programme requirements. As recommended by OECD (2023[34]), new financing sources should be mobilised, with a view to reducing the programme's reliance on fuel tax revenue.

UNDP-BIOFIN proposed extending the PPSA to other ecosystems beyond forests and improving its governance. Other ecosystems would include mangroves, agricultural areas, wetlands, coral reefs, estuaries and open seas, in recognition of additional services such as water and food provisions, air quality regulation, erosion prevention and pollination (Hernández-Blanco, 2020[35]). This would be in line with the high value of these ecosystem services (Section 3.2.4). MINAE has been working to include other ecosystems in the PPSA, in consideration of the goals of the National Decarbonisation Plan 2018-50 (Chapter 1) and the need to broaden the financing mechanisms for biodiversity.

Box 3.2. Improving women's participation in biodiversity-based activities

Strengthening the role of women in biodiversity conservation can help achieve better environmental results and improve income distribution, as women in rural communities tend to be poorer than men. About 12 600 women are food producers, but they own only 15.6% of all farms and 8% of the total agricultural area. In addition, women have often inherited knowledge of the use of nutritive and medicinal plants. However, women's participation in decision-making process linked to biodiversity remains limited. In 2018, women represented only 28% of the National Council of Protected Areas, only 32% in Local Councils of Conservation Areas of marine areas and there was no representation of women in the Local Forest Councils.

Several multi-stakeholder initiatives aim to support women's participation in biodiversity-related activities, in recognition of their key social role in local and indigenous communities in Costa Rica. The Gender Action Plan of the National Strategy REDD+ aims to strengthen the role of women in biodiversity conservation and close the employment and income gaps in the forest sector. The +Women +Nature Programme, co-ordinated by MINAE and UNDP's Biodiversity Finance Initiative (BIOFIN), facilitates women's access to financial instruments. As part of the programme, between 2020 and 2021, three financial instruments worth around USD 30 million granted access to woman in biodiversity activities usually monopolised by men. The Foundation for Development (*Fundecooperacion para el Desarrollo*) together with the National Institute for Social Welfare's Trust Fund (FIDEIMAS) launched the "Women Natura Credit", which grants private capital loans for rural women to launch their ventures. Projects led by women have preferential scores in accessing the PPSA. In addition, FONAFIFO provides concessional credits for women to develop projects related to forest conservation and/or sustainable use.

Source: (World Bank, 2019[36]); (BIOFIN, 2021[37]).

Costa Rica should swiftly approve the draft legislation on reinforcing the PPSA that was submitted to Parliament in April 2022. The bill proposes extending the PPSA to a fully-fledged programme of Payment for Ecosystem Services (PSE). To that end, it would transform FONAFIFO into a sort of natural capital trust (National Fund for Financing Ecosystem Services) for financing the conservation and restoration of all ecosystem services. The bill also proposes a biodiversity offset system, whereby public and private stakeholders could mitigate or compensate for the environmental impact of their activities by purchasing "natural capital credits". The National Fund would use the proceeds of the credits to finance conservation and restoration activities. These are all welcome proposals. However, while the draft legislation broadens the funding sources to the PSE, it still uses an inefficient earmarking logic that may hamper the long-term financial sustainability of the extended programme. In addition, the details of the new PSE programme will have to be carefully defined in implementing regulations.

3.7. Scaling up finance for biodiversity

Costa Rica's public spending on biodiversity conservation and sustainable use is relatively large in international comparison, reflecting the country's policy emphasis. According to estimates, biodiversity-related spending averaged between 0.6% and 0.8% of GDP per year in 2015-20 (Molina-Escalante, 2021[28]).[15] This included spending directly linked to the protection of biodiversity and landscape and expenditures with biodiversity conservation as a co-benefit or secondary purpose. The average biodiversity-related spending in 2015-20 is double the amount of total public spending in all

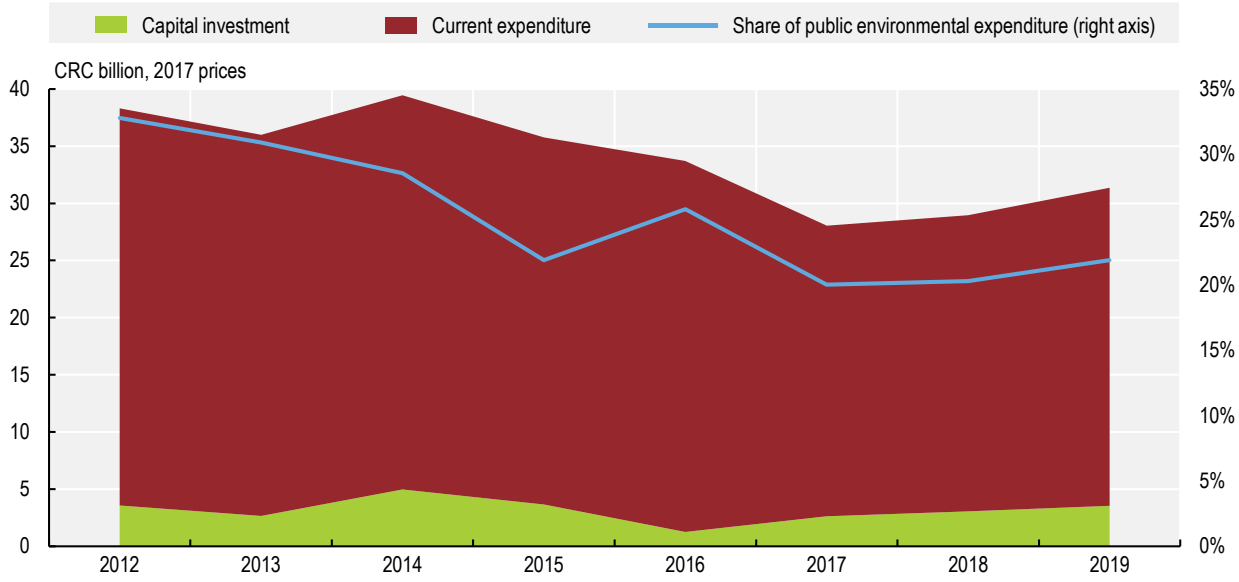
environmental protection domains based on the Classification of the Functions of Government (COFOG) of the national accounts (Chapter 2).

As in other sectors of public administration, there is a need to reinforce the capacity of institutions dealing with biodiversity to spend their budget effectively and carry out their functions (Chapter 2). Indeed, a large part of the estimated biodiversity-related budget was not spent in 2015-20. This includes unspent budget for wastewater treatment (Molina-Escalante, 2021[28]).

More conservative calculations based on COFOG indicate that public expenditures directly linked to the protection of biodiversity and landscape averaged about CRC 33 950 million (USD 62.4 million) per year. This represented 0.1% of GDP and 25% of total public environmental spending in 2012-19 (OECD, 2023[38]).[16] Spending directly linked to biodiversity declined (in real terms) in the same period. Despite a recovery, in 2019 it was still 18% below the 2012 level (Figure 3.10). The central government spends nearly 95% of biodiversity-related expenditure, mainly through its decentralised institutions such as SINAC, CONAGEBIO and FONAFIFO. Investments represent a negligible part of total public expenditure in biodiversity, although they increased slightly in 2016-19.

Figure 3.10. After a decline, expenditure for protecting biodiversity and landscape increased in 2017-19

General government expenditure on protection of biodiversity and landscape, CRC billion, constant 2017 prices.



Source: OECD (2023), "General Government Accounts, SNA 2008 (or SNA 1993): Government expenditure by function", *OECD National Accounts Statistics* (database), https://doi.org/10.1787/data-00019-en (accessed on 4 March 2023).

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Public budget allocations do not seem commensurate with the objectives Costa Rica set for itself and are focused on covering current spending (such as staff costs). Costa Rica is not on track to achieve the ENB2 target of increasing investment in biodiversity to 0.8% of GDP by 2025. Human resources for biodiversity management are insufficient. As in other Latin American countries, this impairs protected area management, enforcement of environmental law and monitoring of biodiversity status (OECD, 2018[10]). The objectives of the ENB2 have been mainstreamed in the PNDIP 2023-26. However, the funding gap is

estimated at USD 90 million per year (0.18% of GDP) for 10-15 years (MINAE, CONAGEBIO and SINAC, 2023[13]).

One of the key ENB2 goals is scaling up finance for biodiversity and improving spending efficiency. Financing for biodiversity comes from a variety of fiscal sources. Part of the revenue from fuel taxes, water-related charges and stamp duties is earmarked for the institutions with environment-related responsibilities.[17] In particular, a share of the fuel tax revenue finances the PPSA (Section 3.6). Except for fuel taxes, revenue is negligible. A comprehensive green tax reform would help raise revenue to finance biodiversity management, among other purposes (Chapter 2). Priority should be given to removing subsidies harmful to biodiversity, including for agriculture and fishing (Sections 3.10 and 3.11), in line with the GBF Target 18.[18] The fiscal savings could be partly redirected to finance biodiversity policy. Reforming entrance fees to the ASPs (Section 3.5.2) and charging fees to tourism companies (Section 3.8) would provide additional revenue.

Development finance is also a significant resource for biodiversity. In 2012-19, bilateral donors that are members of the OECD Development Assistance Committee disbursed USD 26.5 million for projects targeting biodiversity as principal or significant objective in Costa Rica (OECD, 2023[39]). This corresponds to an average of USD 3.3 million per year, or roughly 5% of the annual government expenditure on protection of biodiversity and landscape in the same period. This amount underestimates official development flows related to biodiversity as it does not consider assistance from multilateral organisations and other official flows.

Costa Rica could further build on its experience with conservation trust funds, debt-for-nature swaps and green bonds.[19] FONAFIFO and the NGO Asociación Costa Rica por Siempre are members of the Network of Environmental Funds in Latin America and the Caribbean (RedLAC). The Sustainable Biodiversity Fund (FBS), established in 2010, is a conservation trust fund managed by the National Bank of Costa Rica. With assets of USD 25 million, the FBS supports the Biodiversity Conservation Programme, which provides financial and technical support to landowners for sustainable economic activities on their land. The use of conservation trust funds could be extended. Green bonds can be used to attract finance for investment in biodiversity conservation, environment-related infrastructure and NbS for adaptation to climate change (Chapter 2). At the time of writing, the government was working, with the support of UNDP-BIOFIN, to issue a green bond for securing funds for investing in infrastructure in protected areas.

Actions to reduce carbon emissions from deforestation and forest degradation (REDD+) have vast fund-raising potential. In 2022, Costa Rica became the first country in LAC to receive payments from the Carbon Fund of the Forest Carbon Partnership Facility for reducing GHG emissions in 2018-19. Costa Rica is on track to unlock up to USD 60 million for cutting up to 12 megatonnes of carbon dioxide emissions by 2025 through actions in the forest sector (World Bank, 2022[40]). The PPSA and protected areas are key tools for implementing the national REDD+ strategy and reaching net zero by 2050 (Chapter 1). Blue carbon credits from conserving and restoring coastal ecosystems such as mangroves are also a source of potential finance. In 2022, Costa Rica participated, along with more than 50 governments, NGOs and private partners, in establishing the Global Blue Carbon Coalition to accelerate investments in coastal carbon sinks. It also presented its National Strategy for Blue Carbon.

There is much scope to engage the business sector, including through more use of private-public initiatives such concession contracts for tourism-related services in protected areas, land donation and establishing private nature reserves (Section 3.5.2). Businesses spend little in biodiversity conservation. In 2018-20, they spent less than 1% of their total expenditure on environmental activities (Chapter 2). The National Bioeconomy Strategy 2020-30 promotes equitable use of genetic and biochemical resources as a driver of innovation and business opportunities (Box 3.3).

Box 3.3. Costa Rica's approach to access and benefit sharing

Costa Rica has put in place a coherent system for regulating access to its genetic resources and ensuring a fair sharing of benefits arising from their use (or access and benefit sharing, ABS). CONAGEBIO oversees access to genetic and biodiversity resources and releases the related permits. Use of genetic and biochemical resources is conditional to prior informed consent and mutually agreed conditions with local producers to share the benefits of the research and commercialisation of the products using such resources. Since 2016, seven companies have been granted this permit and have concluded contracts for benefit sharing. This is second in the world after Colombia, which has granted nine such permits.

In 2018, Costa Rica launched the *Distintivo ABS*, a label certifying that a product using the country's genetic resources complies with the ABS regulations and good practices. This is a first for Latin America. Since 2021, six products have obtained the ABS certification.

However, an agreement on access to, and use of, genetic resources in indigenous territories and on the preservation of indigenous practices and knowledge, is still pending. This has impeded the ratification of the Nagoya Protocol on ABS, which entered into force in 2014.

Source: (CONAGEBIO, 2023[41]).

3.8. Mainstreaming biodiversity considerations in tourism policy

3.8.1. The strong nexus between biodiversity and tourism

Tourism is well developed and a major driver of economic growth in Costa Rica. In 2021, the country had the fourth highest score of the World Economic Forum's Travel and Tourism Development Index among LAC countries (after Chile, Mexico and Brazil). This is the result of a long-standing emphasis on investing in the sector and promoting the country's brand abroad (WEF, 2022[42]). COVID-19 hit the sector strongly. In 2019, before the pandemic, tourism accounted for 4.8% of GDP, nearly 8% of formal employment and 37% of service exports (well above the OECD average of 20.5%). Tourism recovered in 2021 but not to its pre-crisis level. In 2021, international tourist arrivals were 1.3 million compared to more than 3.3 million in 2018-19, equivalent to about 60% of the country's population (OECD, 2022[43]). Costa Rica expects international visitors to return to pre-pandemic levels by 2024.

Costa Rica's long coastlines and rich biodiversity are the main tourist attraction. In 2017-19, 72% of travellers to Costa Rica visited the country to enjoy its beaches and 65% to engage in nature-based activities (such as visiting volcanos and observing flora and fauna) (ICT, 2022[44]). Natural protected areas have been a driver of Costa Rica's success as tourist destination, generating income and jobs (Section 3.5). In 2011-19, the number of visitors to the ASPs increased by 50% to about 2 270 000 (Figure 3.8). Tourism contributes to generate financial resources for biodiversity conservation through ASP entrance fees and concessions for tourism-related services, whose revenue goes to the SINAC budget (Section 3.5). At the same time, the management of growing flows of tourists in fragile natural areas requires more resources. Tourism is highly seasonal in Costa Rica and concentrates in relatively few areas of the country. This is also where most road infrastructure and accommodation services are located (the Pacific coast, South Caribbean coast, the Central Valley and the protected areas in the centre-north of the country).

Massive tourist flows concentrated in a few months and areas have exerted pressures on ecosystems and species, within and outside the ASPs. In addition to direct disturbances to fauna and flora,[20] pressures include increased sewage and waste flows in coastal and mountain areas, where treatment infrastructure and services are insufficient even for residents (Chapter 1). This results in pollution of rivers, beaches and oceans. Continued unregulated development of tourism infrastructure and residential areas is of concern, especially in coastal areas (Section 3.4). In many cases, road and electricity networks have been extended to provide accessibility and services to natural areas without the necessary mitigation measures. This has negatively impacted charismatic fauna species, such as sloths, armadillos and monkeys, which have been run over or electrocuted (CREST, 2010[45]).

Like other megadiverse tourism destinations, Costa Rica needs to balance the challenge of developing infrastructure with maintaining the integrity of ecosystems and their accessibility to the public (Echeverri et al., 2022[46]). As recognised by the ENB2 and other government policy documents, addressing tourism pressures on ecosystems primarily requires completing land-use planning and ensuring that territorial plans consider biodiversity (Section 3.4). It is also essential to improve the treatment of waste and wastewater (Chapter 1).

3.8.2. Policies and actions for sustainable tourism

Costa Rica tourism policy has long recognised the key role of a healthy biodiversity for the competitiveness of tourism, as well as the potential negative impact of the sector on ecosystems and species. The ITC's National Plan for Tourism of Costa Rica 2022-27 explicitly prioritises sustainable tourism and the conservation of natural sites. For more than a decade, SINAC has run a tourism programme to improve infrastructure and tourism services in the ASPs in collaboration with municipalities, promote tourism in selected priority areas and increase tourism-related revenues to contribute to protected area management (Section 3.5.2).

The country has branded itself as an ecotourism destination, including through voluntary certification and labelling schemes, such as the country's brand "Essential Costa Rica" (Chapter 2), the Ecological Blue Flag (BAE) for beaches and the Certification for Sustainable Tourism (CST) (OECD, 2023[47]) (Box 3.4). Costa Rica should consider assigning the audit for the CST and BAE to accredited bodies, as done for the country's brand. This would guarantee that certification procedures meet international principles for transparency, impartiality and competence, thereby further consolidating their credibility. Costa Rica could consider levying fees on tourism companies to recognise the benefits they receive from a preserved nature and use the revenue to finance biodiversity conservation. Peru has a similar scheme for companies operating in the Manu National Park (OECD, 2018[10]).

Several initiatives have sprung up to reduce the negative environmental impact of tourism development. Many such initiatives involve public institutions in partnership with tourism business organisation and/or companies, local communities, academia and NGOs. For example, some tourism companies have led initiatives to repopulate coral reefs. The ICT and FONAFIFO launched a tool to calculate and voluntarily offset GHG emissions of international flights, with proceeds used for financing the PPSA. The government-led "#stopanimalselfies" campaign aims to break tourists' habit of taking selfies and photos in direct contact with wild animals, which is cruel to animals and risky for people (Stop Animal Selfies, 2022[48]). Raising awareness of tourists and tourism companies is essential to achieve better conservation outcomes (Echeverri et al., 2022[46]).

Box 3.4. Tourism-related certification programmes

In 2018, Costa Rica restructured and updated the Certification for Sustainable Tourism (CST), launched in 1997, to address some weaknesses and adapt it to new international standards (OECD, 2022[43]). The Global Sustainable Tourism Council recognised the renewed CST as compliant with its criteria for sustainable tourism. The certification is based on business, social and environmental criteria, including a company's energy efficiency, water, wastewater and waste management, and actions towards biodiversity conservation, pollution reduction and climate change mitigation and adaptation.[21] The CST is voluntary and lasts two years. To encourage companies to seek certification, the CST procedure is free of charge and companies earn benefits such as information on environmental good practices, promotional material and marketing support (OECD, 2022[43]). The ITC verifies that applicants meet the requirements for certification. The CST is awarded by a technical commission composed by representatives of ICT, MINAE, Ministry of Culture and Youth, National Chamber of Tourism and/or National Chamber of Ecotourism and Sustainable Tourism. At the end of 2021, 216 organisations were CST-certified, mostly hotels (ICT, 2022[21]). At the time of writing, three ASPs (the national parks of Carara, Manuel Antonio and Volcán Poás) were also CST-certified.

The Ecological Blue Flag (BAE) for beaches, launched in 1995, recognises beaches that meet certain ecological criteria. It also aims to engage local communities, including tourism businesses, in the sustainable management of the coastal area. The BAE is awarded by a national commission composed of representatives of 15 public and private entities, including ICT, MINAE, the Institute of Aqueducts and Sewers, the ministries of agriculture, health and education, National Chamber of Tourism, National Union of Local Governments, and Institute for Municipal Development and Advisory. The certification was extended to certify climate mitigation actions undertaken by industrial businesses (Chapter 2). At the time of writing, 140 beaches were BAE-certified, mostly with one of a maximum of five stars (ICT, 2022[21]).

Source: (ICT, 2022[21]; OECD, 2022[43]).

3.9. Mainstreaming biodiversity considerations in farming practices

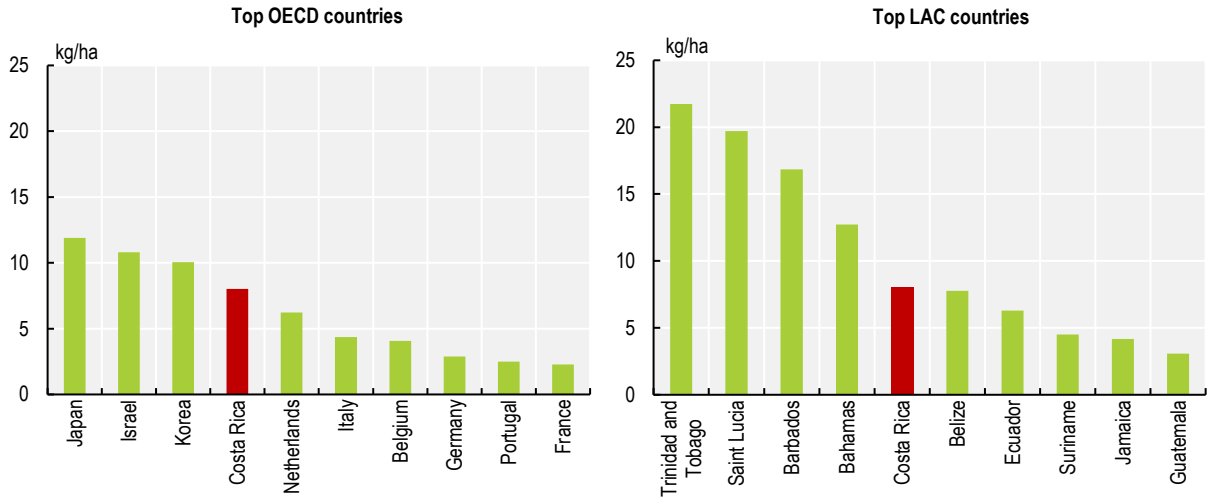
Costa Rica's agriculture is productive and export-oriented, accounting for about 5% of GDP and 12% of employment in 2020. The country is the largest global producer of pineapple, and a major exporter of bananas and coffee. Productivity levels in agriculture in Costa Rica are twice as high as in other Central American economies (Roosendaal et al., 2021[49]). However, land conversion to pastures and cropland grew in the second half of the 2010s (CONARE, 2021[5]). Unsustainable monocultures and uncontrolled use of agrochemicals have degraded soil, polluted water, and damaged aquatic ecosystems and species, as well as human health (Roosendaal et al., 2021[49]; OECD, 2023[47]). The agricultural sector is also the largest consumer of water in the country. Costa Rica continues to have higher nutrient balances for nitrogen and phosphorus than the respective OECD averages (OECD, 2022[50]).

The intensity of pesticide use declined by 26% between 2010 and 2018. However, by 2020, it was slightly higher than at the beginning of the decade. At 8 kg/ha of agricultural land, Costa Rica has among the highest intensity of pesticide use among OECD and LAC countries (Figure 3.11). Many of these pesticides are highly hazardous and have not been assessed for environmental risk since their first registration in Costa Rica. In many cases, this dates back several years (Vargas Castro, 2021[51]). A new regulation on the environmental risk assessment and approval of agrochemicals entered into force in early 2023. It streamlines and improves a complicated registration process for new agrochemicals, which had resulted

in a lack of new registered pesticides over the last ten years. The new regulation aims to ensure all pesticides are submitted to an appropriate environmental risk assessment. The country should also remove from the market those that exceed acceptable hazard levels for ecosystems and human health.

Figure 3.11. Intensity of pesticide use is one of the highest among OECD and LAC countries

Intensity of pesticide use per unit of agricultural land, top ten OECD and LAC countries, 2020.



Source: FAO (2023), *FAOSTAT Land Use* (database); FAO (2023); *FAOSTAT Pesticides Use* (database).

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The agricultural policy framework, as set by the 2019-22 Policy Guidelines for the Agricultural, Fishing and Rural Sector, includes a cross-cutting focus on climate change and preparedness to natural disasters. The first priority axis of the National Bioeconomy Strategy 2020-30 aims to promote environmentally sustainable and low-carbon farming and fishing. The Sustainable Landscape Initiative 2022-30 foresees maintaining zero-net deforestation in agricultural landscape, reducing use of agrochemicals in agriculture and implementing good agricultural practices (Chapter 1). These actions are expected to help curb GHG emissions from agriculture, forestry and other land-use sectors but will also benefit biodiversity.

The government and the private sector have developed several initiatives to address the adverse environmental impacts of farming. These include promoting good agricultural practice through guidance and capacity building (e.g. for pineapples, bananas and sugarcane) and *Buenas Prácticas Agrícolas*, the voluntary certification programme. The Agricultural Extension Programme led to almost 4 000 models of sustainable production in the country's main agricultural activities through various initiatives, including training and capacity building for producers (OECD, 2023[47]).

The Nationally Appropriate Mitigation Actions (NAMAs) for coffee and livestock production were launched in 2013 and 2015, respectively, in collaboration with the private sector and international partners. In 2022, in line with the National Decarbonisation Plan 2018-50, Costa Rica was piloting additional NAMAs to cover all the main production sectors (sugar, rice and musaceae). Within the NAMA framework, the government provides training and technical assistance to public servants, farmers and producers. The NAMAs focus on reducing GHG emissions from farming, but they also identify technologies and practices that help agriculture adapt to climate change and minimise the impacts on biodiversity and water. These include reducing fertiliser and pesticide use (Chapter 1).

Costa Rica has been an early mover in the field of organic production, with the first related law passed in 1995. However, organic production remains marginal. Less than 1% of total agricultural area was under organic farming in 2020, compared to the OECD average of 4.8% and the LAC average of 2.4% (FAO, 2023[52]). Organic farming faces several barriers, including insufficient technical assistance and innovation, and the high cost of certification and organic fertilisers. Small-scale organic farmers encounter difficulties in accessing international markets and receiving price premiums for their organic products.

Costa Rica's agricultural support for producers has declined since 2000 and is relatively limited. It amounted to 4.9% of gross farm receipts in 2019-21, well below the OECD average. It includes support to advisory services and innovation, with significant emphasis on environmental protection. Farmers also receive payments for practices such as the use of green or living fences and terraces, organic production or soil condition improvements.

Progress has been made in reducing market-price support to rice by eliminating the reference price and reducing import tariffs. Ultimately, this would also facilitate access to basic goods at lower prices, benefiting low-income households (OECD, 2023[34]). Prior to this move, in 2019-21, 89% of support was based on market-price support (through border tariffs and minimum reference prices).[22] This is one of the most production-distorting forms of support and, therefore, can increase pressures on natural resources (OECD, 2022[50]). In addition, sales of agricultural inputs, such as fertilisers and pesticides, have long benefited from a total sales tax exemption, which has encouraged their use. In 2018, this was replaced by a nearly full exemption from the value added tax.[23]

The government should phase out market-price support and subsidies to agrochemicals. It could replace them with time-bound payments targeted to producers in need and/or redirect support to incentivise environmentally beneficial practices. In addition, Costa Rica could consider a tax based on the amount of active ingredients in pesticides, as well as one based on the quantity of nitrogen and phosphorous in chemical fertilisers, following the example of other countries (UNEP, 2020[53]).

3.10. Mainstreaming biodiversity considerations in fishing

Fishing and aquaculture represent a low share of Costa Rica's GDP and employment.[24] Nonetheless, fishing has high social value and is a major source of income for artisanal fishers in the rural and isolated communities in coastal areas (UNCTAD, 2019[54]). The 24 coastal cantons that depend highly on fishing are among the poorest in Costa Rica. Overexploitation of coastal fisheries, as well as invasive alien species such as the voracious lionfish, led to a drop in the volume, size and market value of the catch of small-scale fishers in the last decade, which has affected the livelihood of traditional fishers. Offshore pelagic fisheries generate most catches and revenues. These species, including tuna, are mainly captured by foreign vessels licensed to operate in Costa Rican waters (World Bank, 2020[55]). Between 2010 and 2020, tonnes of marine capture increased by 88%. Small-scale fisheries are estimated to account for about 10% of total landings (wild capture).

The status of fishery resources in Costa Rica is uncertain. The country has not recently assessed the biological sustainability of fish stocks, which is the basis for the sustainable management of fisheries. As of early 2023, such assessment was ongoing. Fishery resources are estimated to be overexploited within the first 20 km along the coasts. High-capacity fishing gear with low selectivity and harvesting during reproductive seasons threatens several marine species and habitats (MINAE et al., 2018[1]). In addition, as in other countries, ghost gear (i.e. lost, abandoned or discarded at sea) causes the unintended capture of marine fauna, abrasion and smothering of the seabed, and generates marine litter. Fishers are obliged to report lost gear so it can be subsequently located and recovered. However, more could be done to control ghost gear by adopting best international practices such as gear marking; creating disposal facilities at port; and introducing extended producer responsibility for fishing gear (especially when made of plastics) (OECD, 2022[8]).

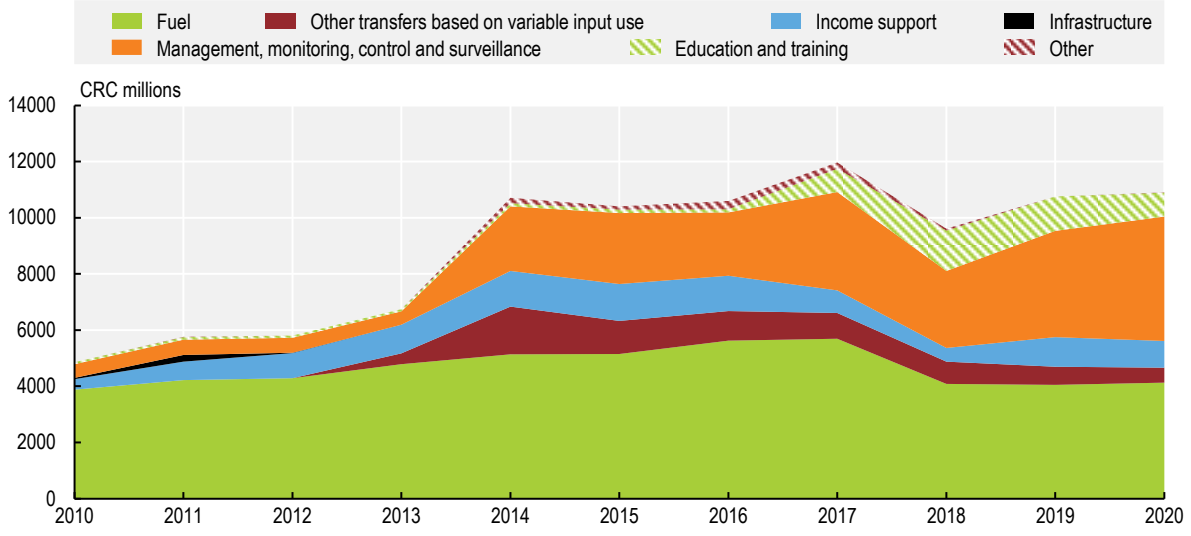
Costa Rica adopts regulatory tools to manage fisheries' stocks. These include limits to fishing licences and days at sea and restrictions on fishing practices to manage fisheries' stocks. None of the five commercially important species of fish stocks, including tuna, are subject to total allowable catch limits, i.e. time-bound limits set on the quantity of fish that can be caught or landed by the fishery (OECD, 2023[56]). Licensing of fishing rights for small-scale fishers has started but is incomplete, with many fishers operating illegally. The government adopted regulations for monitoring the tuna captured with and without mortality of dolphins, as well as to prohibit the fishing or unintentional capture of hammerhead sharks. As of 2020, it was developing three fisheries management plans (OECD, 2021[57]). In 2021, Costa Rica launched the *Pura Vida* label to certify sustainably caught and processed fish and seafood.

In 2008, Costa Rica introduced a voluntary area-based management tool – the Marine Area of Responsible Fishing (AMPR) – where small-scall fishers commit to comply with sustainable fishing requirements and participate in the zoning, management and vigilance of fisheries. Each AMPR establishes its management plan and code of responsible fishing conduct. As of early 2023, 13 AMPRs had been established, mostly in the Gulf of Nicoya. The experience of the first AMPRs showed benefits for small-scale fishers, which became more involved in the conservation of the marine resources they exploit. However, the environmental benefits of the AMPRs were less clear (Fargier, Hartmann and Molina-Ureña, 2014[58]).

Fishing is heavily subsidised in Costa Rica. Support to fisheries was 35% of the value of landings in 2018-20, the fifth highest share in the OECD (OECD, 2022[8]). While nominal support to fishery doubled between 2010-12 and 2018-20, the country has made progress in reducing support that can lead to harmful environmental outcomes. Indeed, growing support was provided to management, monitoring, control and surveillance, as well as education and training. These can help improve the efficiency and sustainability of the sector and maintain coastal employment (Figure 3.12). However, in 2018-20, 46% of fishery support was still targeting fishing inputs, through tax exemptions and price discounts on fuel use and other subsidies that lower input costs. The excise tax exemption on fuel used in fishing is 14% of all revenue losses due to the exemptions from the fuel duty, the second highest item (Chapter 2).

Figure 3.12. Potentially harmful support to fishing declined in the last decade but remains high

Government fisheries support estimate by category, CRC millions, 2010-20.



Source: OECD (2023), "Fisheries: Fisheries support estimates", *OECD Agriculture Statistics* (database), https://doi.org/10.1787/ade64fdc-en.

StatLink https://stat.link/eqbapd

Costa Rica should continue to remove fishery support linked to input use, primarily fuel use, as such support can encourage unsustainable fishing in the absence of effective fisheries management. It is also more likely to increase illegal fishing, resulting in higher impacts on marine species and ecosystems, as well as higher GHG emissions (OECD, 2022[8]). Support that lowers input costs is generally not effective at raising fishers' incomes and tends to disproportionally benefit large fuel-intensive fishing companies. In so doing, it reduces the competitiveness of smaller-scale fishers, making them worse off. Financial resources saved from subsidy reform could be repurposed for targeted direct income support to fishers in need and for improving the environmental sustainability of fishing more generally. To that end, Costa Rica could provide financial support to sustainable fisheries management, enforcement and improved knowledge about the pressures on fish stocks and the impact of fishery policy on marine biodiversity. As recommended by OECD (2022[8]), the government has been working towards the acceptance of the 2022 World Trade Organization Agreement on Fisheries Subsidies to eliminate some of the most potentially harmful types of subsidies. These are defined as those that benefit illegal, unreported and unregulated fishing; fishing of overfished stocks; and fishing in unregulated high seas.

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Notes

[1] The Central Valley is a broad, flat plain located at an altitude of between 800 and 1 500 metres above sea level.

[2] Egg harvesting and hunting of adult green turtles for food provision represents one of the strongest threats, as does the use of dolphin meat as shark bait.

[3] Due to information constraints, this value excludes the evaluation of ecosystem service provided by rivers (Hernández-Blanco and Costanza, 2021[11]).

[4] CONAC comprises the environment minister, the executive directors of SINAC and CONAGEBIO, the directors of each conservation area and one representative of each regional council.

[5] Other international agreements include the Convention on International Trade in Endangered Species of Wild Fauna and Flora and the Convention to Combat Desertification and the Ramsar Convention on Wetlands.

[6] For more information: https://raicescr.com/english.

[7] Target 1 of the GBF states, "Ensure that all areas are under participatory integrated biodiversity inclusive spatial planning and/or effective management processes addressing land and sea use change."

[8] The protected areas management categories are marine management area, absolute nature reserve, biological reserve, national park, wetland, national monument, forest reserve, protective zone and national wildlife refuge. There are no areas established under the category of "urban natural parks" (PANU), which was introduced in 2021 to address the specific pressures on ecosystems within urban areas.

[9] Target 3 of the GBF states "Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures."

[10] According to the CBD's definition, an OECM is a "a geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socioeconomic, and other locally relevant values".

[11] The terrestrial ecoregions of Costa Rica are: Central American dry forests; Cocos Island moist forests; Costa Rican seasonal moist forests; Isthmian-Atlantic moist forests; Isthmian-Pacific moist forests;

Mesoamerican Gulf-Caribbean mangroves; Southern Mesoamerican Pacific mangroves; Talamancan montane forests.

[12] The EBSAs off Costa Rica's Caribbean cost, and fully in under country's jurisdiction, are Cahuita – Gandoca and Tortuguero – Barra del Colorado.

[13] Fees are higher for the national parks Chirripó and Isla del Coco.

[14] The forest conservation requires required owners to protect existing forest for five years. Under the reforestation scheme, landowners commit to plant trees in abandoned cleared lands and maintain them for 15 years. The sustainable forest management contract requires having low-intensive logging while maintaining ecosystem services for the logged forests. The agro-forestry scheme allows small-scale landowners to combine agriculture activities and forest conservation.

[15] The lower end of the range refers to the annual average of biodiversity-related expenditure executed by decentralised institutions. The upper bound is the average sum of expenditure executed by central government ministries and decentralised institutions. The upper bound is a likely overestimation, as it includes transfers from the central government to the decentralised institutions such as FONAFIFO and SINAC.

[16] "Protection of biodiversity and landscape" is an expenditure category under the national accounts COFOG.

[17] Stamp duties include the Wildlife Stamp on vehicles and the National Park Stamp on passports. Proceeds are earmarked to MINAE Wildlife Directorate and SINAC, respectively.

[18] The GBF Target 18 states, "Identify by 2025, and eliminate, phase out or reform incentives, including subsidies harmful for biodiversity, in a proportionate, just, fair, effective and equitable way, while substantially and progressively reducing them by at least 500 billion United States dollars per year by 2030, starting with the most harmful incentives, and scale up positive incentives for the conservation and sustainable use of biodiversity."

[19] A trust fund generally collects resources from international donors, states or private sector stakeholders enabling them to generate, through diversified investments, a financial return paid back in the form of grants to protected areas or NGOs that act in favour of biodiversity conservation.

[20] These range from irresponsible habits (e.g. throwing waste in nature, harvesting of flora species, touching wild animals, anchoring of boats on reef areas) to unintended consequences of some leisure activities. For example, lighting of beaches and boats can affect the orientation of sea turtles during nesting; acoustic pollution can harm the communication and orientation capacity of cetaceans.

[21] The CST has two levels – basic and elite. Organisations that meet all the mandatory requirements have the basic certification. The elite level is for organisations that commit to continuous improvement and positive spillovers.

[22] Market-price support is defined as the "monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level" (OECD, 2022[50]).

[23] A reduced value added tax rate of 1% applies to agricultural input, compared to the standard rate of 13%.

[24] In 2020, fish production from fishing and aquaculture was USD 103 million, or less than 0.5% of GDP.

OECD Environmental Performance Reviews

COSTA RICA

A megadiverse county, Costa Rica is known globally for its success in reversing deforestation and pursuing a growth model based on the sustainable use of its environmental resources. However, energy use and related greenhouse gas emissions increased in the last decade. Private cars are a major and growing source of emissions affecting climate and air quality. Waste disposal still relies on landfills, and much wastewater is untreated. Costa Rica's extensive protected area network and pioneering programme of payments for ecosystem services have helped reduce biodiversity loss and extend forests' carbon sequestration capacity. However, more should be done to tackle pressures on biodiversity from development of infrastructure and settlements, tourism, farming and fishing. The sheer scale of investment needed to achieve the Sustainable Development Goals calls for improving the efficiency of public spending, mobilising private finance, strictly enforcing regulations and providing adequate incentives.

This is the first *OECD Environmental Performance Review* of Costa Rica. It evaluates the country's progress towards sustainable development, with a special chapter focusing on biodiversity, and provides 52 recommendations.

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