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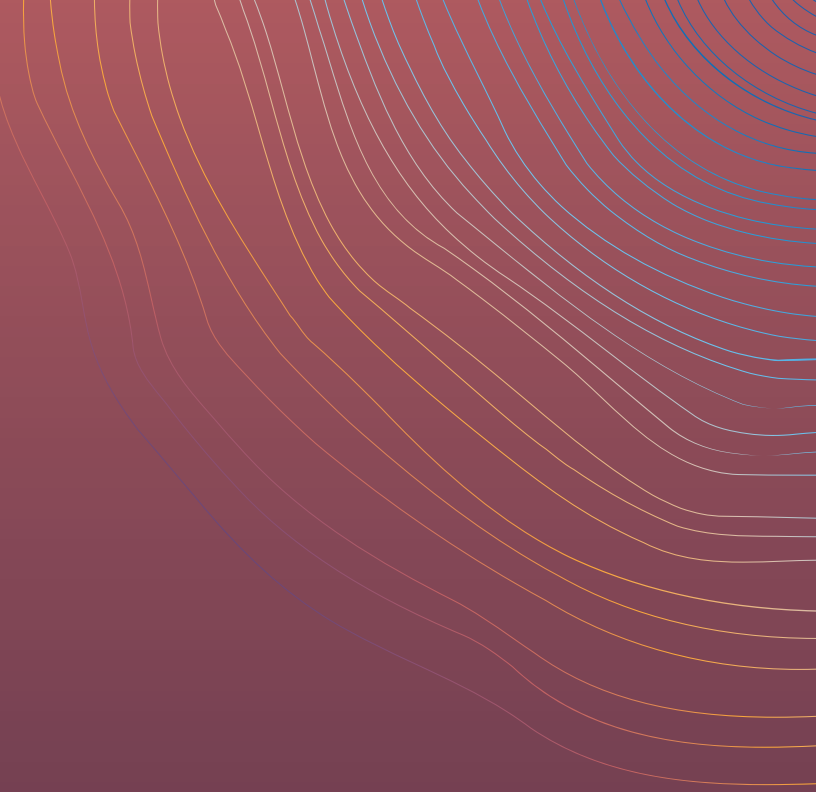
CABO VERDE

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World Bank Group

COUNTRY CLIMATE AND DEVELOPMENT REPORT

January 2025



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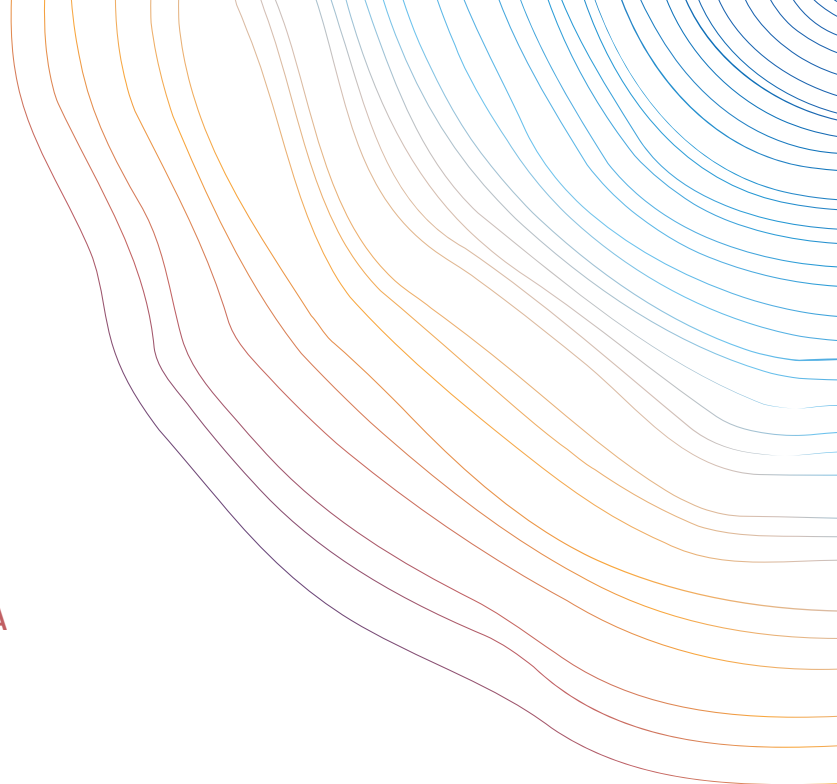
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Acknowledgements

This report was authored by a World Bank Group task team led by Lorenzo Carrera, Veruschka Schmidt, and Cyril Desponts.

The report benefited from invaluable inputs from a wider task team that included Abdoulaye Boly, Ahmed Al Qabany, Anna Carlotta Allen Massingue, Antonio Manuel Baptista, Anupurba Roy, Asha Johnson, Camila Mejia Giraldo, Christina Jutta Paul, Claudia Soto, Cyrille Valence Ngouana Kengne, Daniel Valderrama Gonzalez, Daniela Marotta, Damien Matthias Valentin Boucher, Emily Elaine Gardner, Eduardo Carbonel, Elisson M. Wright, Fabio Aparecido da Silva, Fred Kizito, GianLeo Frisari, Jorge Barreto, Jia Jun Lee, Karamba Badio, Laura Ximena Bermeo Rojas, Laurent Damblat, Louise Twining-Ward, Luisa Teixeira De Melo De C Felino, Luca Bernasconi, Marc-Anton Wilhelm Pruefer, Mathias Shabanaj Jankila, Michel Matera, Miles Bernard Johnson, Miguel Angel Jorge, Miguel Heleno, Nyandeng V. Gajang, Oscar Anil Ishizawa Escudero, Philippe Neves, Rafael Pardo, Raluca Georgiana Golumbeanu, Rodrigo Andrade, Rodrigo Pereira Porto, Ronak Makhani, Rosa Brito Delgado, Shreya Rangarajan, Sujatha Venkat Ganeshan, Tom Remy, Unnada Chewpreecha, and Zineb Benkirane.

The team would like to extend sincere thanks to the Industrial Economics (IEc) team of Brent Boehlert, Diego Castillo, Kim Smet, and Kenneth Strzepek, who led the impact channel and adaptation modeling.

The team benefited immensely from the guidance of, and is grateful to, the peer reviewers: Craig Meisner, Kodzovi Senu Abalo, Pablo Andres Salas Bravo, Philippe Ambrosi and Urvashi Narain. Additional guidance was also received from Sebastian Molineus, Victor Bundi Mosoti, and Kevin Carey.

Additionally, the task team would like to express heartfelt gratitude to the participants in the Country Climate and Development Report (CCDR) consultations for their availability, their collaborative spirit, and the quality of their contributions. They comprise representatives of ministries, government agencies, academia, civil society, the private sector, and the development community. A special thanks goes to Gilson Pina and Andrea Lucy Martins from the Ministry of Finance, and to Alexandre Nevsky Rodrigues from the Ministry of Agriculture and Environment.

Thanks are also extended to World Bank management and their teams for their guidance, in particular, Keiko Meiwa, Chakib Jenane, Olivier Buyoya, Moritz Nikolaus, Abebe Adugna, Eneida Fernandes, Indira Campos, Ellysar Baroudy, Kanta Kumari, Edouard Al-Dahdah, Frederic Verdol, Asha Johnson, Rebekka E. Grun, and Angela Armstrong.

Editorial support and graphical design were provided by Global Corporate Solutions Translation and Interpretation Services (GCSTI).

Acronyms

A&R	Adaptation and Resilience (Diagnostic)
AAL	Average Annual Losses
ANAS	National Agency for Water and Sanitation
BDS	Business Development Services
BVC	Cabo Verde Stock Exchange (<i>Bolsa de Valores de Cabo Verde</i>)
CCDR	Country Climate and Development Report
CC-MFMOD	Climate Change Macro-Fiscal Model
CEA	Country Environmental Assessment
CO₂	Carbon Dioxide
CO₂eq	Carbon Dioxide Equivalent
CPSD	Country Private Sector Diagnostic
CSA	Climate-smart Agriculture
CSU	Social Registry (<i>Cadastró Social Unico</i>)
DNP	National Planning Directorate
DRF	Disaster Risk Finance
DRM	Disaster Risk Management
EEZ	Exclusive Economic Zone
ENRRD	National Strategy for Disaster Risk Reduction
ESCO	Energy Service Company
ESIA	Environmental and Social Impact Assessment
EU	European Union
EIB	European Investment Bank
EV	Electric Vehicle
FAO	(United Nations) Food and Agriculture Organization
FDI	Foreign Direct Investment
GreenH₂	Green Hydrogen
GCAM	Global Climate Change Analysis Model
GDP	Gross Domestic Product
Gg	Gigagrams (10 ⁹ g or 1,000,000 kg)
GHG	Greenhouse Gas
GoCV	Government of Cabo Verde
ha	Hectares

ICE	Internal Combustion Engine
ICMA	International Capital Markets Association
IDA	International Development Association
IDRF	Instituto Nacional de Estatística
IFC	International Finance Corporation
IMF	International Monetary Fund
IPP	Independent Power Producer
IPPU	Industrial Processes and Product Use
IUU	Illegal, Unreported and Unregulated
KPI	Key Performance Indicator
LFP	Labor Force Participation
LULUCF	Land Use, Land-Use Change, and Forestry
MAA	Ministry of Agriculture and Environment
MFIDS	Ministry of Family, Inclusion and Social Development
MIGA	Multilateral Investment Guarantee Agency
mm	Millimeters
MoU	Memorandum of Understanding
MRV	Monitoring, Reporting and Verification
MW	Megawatt
MWh	Megawatt-hour
NbS	Nature-based Solutions
NDC	Nationally Determined Contribution
NZP	Net Zero Power (Emissions)
ONSEC	National Operator of the Cabo Verde Electricity System (<i>Operador Nacional do Sistema Eléctrico de Cabo Verde</i>)
OWMP	Operational Waste Management Plan
PEDS II	Strategic Plan for Sustainable Development 2022–2026 (<i>Plano Estratégico de Desenvolvimento Sustentavel</i>)
PNI	National Infrastructure Plan
PNSE	National Program for Sustainable Energy
pp	Percentage Point(s)
PPIAF	Public–Private Infrastructure Advisory Facility
PPP	Public–Private Partnership
ProMEC	Promotion of Electric Mobility in Cabo Verde Project
PV	Photovoltaic

QRP	Quick Recovery Plan
RE	Renewable Energy
RSIE	Emergency Cash Transfer Program (<i>Rendimento Social de Inclusão Emergencial</i>)
SIDS	Small Island Developing State
SLB	Sustainability-linked Bond
SMEs	Small- and Medium-size Enterprises
SOE	State-owned Enterprise
tCO₂eq	Tons of Carbon Dioxide Equivalent
toe	Tons of Oil Equivalent
TVET	Technical and Vocational Education and Training
VRE	Variable Renewable Energy





EXECUTIVE SUMMARY

Climate change will compound Cabo Verde's economic and climate vulnerabilities

As a small island developing state (SIDS), Cabo Verde is highly vulnerable to extreme climate events. Some 500 km off the west coast of Africa, it is an archipelago of ten islands with a population of 556,000, half of them on Santiago Island. Because of its location, Cabo Verde is highly vulnerable to natural hazards, including extreme heat, floods, droughts, tropical storms, landslides, volcanic eruptions, coastal erosion and sea level rise. This vulnerability is compounded by its sparse population and archipelagic geography, which make inter-island connectivity and hence service provision challenging, yet increase the population's dependence on maritime transport. Structural factors such as rapid rural–urban migration and land degradation further aggravate the country's vulnerability to natural hazards.

On average, adverse natural events have historically been associated with a decrease in GDP per capita of almost 1 percentage point in the year of impact. Approximately a third of Cabo Verdeans are at risk of being affected by an extreme climate event, especially droughts and floods.

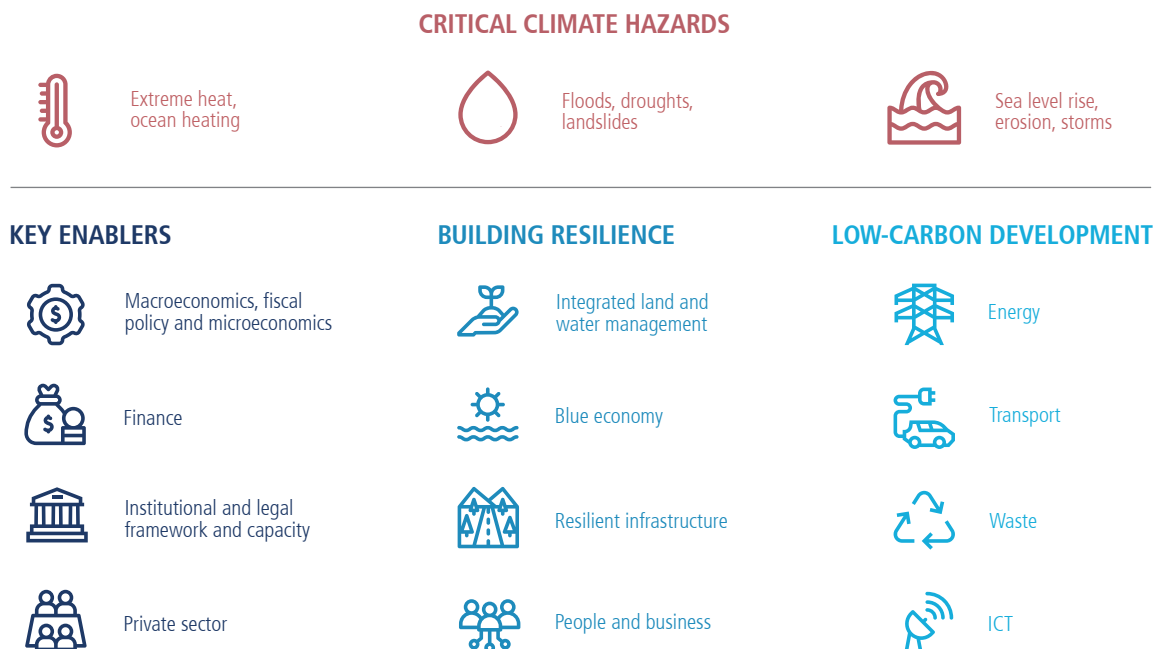
Cabo Verde's climate exposure, partly also because of its geography, is compounded by economic vulnerabilities. The country has experienced robust economic growth since the early 1990s and achieved a substantial reduction in poverty, but growth has been volatile and has slowed in recent years. Reflecting the comparative advantage of its attractive natural geography, growth has primarily been driven by the tourism sector, which accounts for a quarter of GDP, over half of exports, and most foreign direct investment. For similar reasons, the archipelago is heavily reliant on imports, notably those of fuel and food. High levels of remittance and concessional international financing serve to bridge its external financing needs but they generate additional external vulnerabilities. Adding to this, although recurrent fiscal deficits have recently resorbed, public spending is rigid¹ and public debt remains above 100 percent of GDP. The COVID-19 pandemic put Cabo Verde's external vulnerabilities on display, causing a steep decline in tourism revenue and a surge in the food and fuel import bill before the economy returned to pre-pandemic conditions in 2023.

Because of current vulnerabilities, climate change is expected to cause substantial economic and social damage, notably through the tourism sector. A Climate Change Macro-Fiscal Model (CC-MFMod) was developed for this CCDR, modeling the impacts of climate change under optimistic (wet and warm) and pessimistic (hot and dry) scenarios. In the absence of climate action, Cabo Verde’s GDP is expected to be between 3.1 and 3.6 percent lower in 2050. Rising temperatures and unpredictable weather patterns would depress tourism earnings by 10 percent by 2050, accounting for 90 percent of the projected damage to GDP. Rainfed crop revenues, driven by lower vegetable output, would also be as much as 10 percent lower in the pessimistic scenario, while changing sea temperatures and conditions would lower marine fisheries output.

Expected damage to Cabo Verde’s infrastructure would remain elevated, aggravated by sea level rise. Beyond its impact on growth, climate change would also raise Cabo Verde’s long-term investment, import, and external financing needs. Primarily through its effect on household income, it would increase poverty by up to 1 percentage point (pp) annually after 2040 and increase the depth of poverty by up to 6.8 percent. Climate damage would vary per island, reflecting the geographic concentration of tourism and agricultural activity.

Against the backdrop of current vulnerabilities, this CCDR analyzes how Cabo Verde can build climate resilience and stimulate low-carbon development, while identifying key enablers. Figure ES.1 presents the report’s conceptual framework. After introducing Cabo Verde’s development and climate trajectory, the CCDR estimates the projected economic and social damage from climate change (chapter 1). The report then proceeds to a discussion of the country’s relevant institutional and legal framework (chapter 2), the main ways in which a climate-resilient economy can be achieved at the water–land nexus and through the blue economy and infrastructure systems (chapter 3), the green transition in the energy, transport, waste, and digital sectors (chapter 4), the core actions to support the private sector and people to become more climate shock-resilient through social protection, and finally, the skills needed for, and the strengthening of, the health system (chapter 5). Chapter 6 brings together the recommendations presented in the earlier chapters, estimating their costs and benefits and modeling their effects on the economy. It demonstrates that prompt, early actions can do more than prevent losses; they can boost growth. The chapter also lays out avenues for financing the transition.

Figure ES1. Conceptual framework for climate and development actions in Cabo Verde



To attain its ambitious development goals, Cabo Verde needs to take a resilient, low-carbon development path

Building resilience at the water–agriculture–land nexus

Sustainably raising food production despite climate change is one of Cabo Verde's great challenges. Only about 10 percent of the country's land is arable, and the agricultural sector faces low productivity and vulnerability to erratic rainfall and prolonged cyclical droughts. The country is facing absolute water scarcity,² compounded by saline intrusion from sea-level rise and significant water losses. As a result, the agriculture and livestock sectors contribute less than 5 percent of the country's total GDP, and food imports account for 80 percent of domestic consumption. The sector's development is nonetheless central to Cabo Verde's food security and socioeconomic development, especially since it employs 18 percent of the population, particularly in the more vulnerable rural and poor communities.

An integrated water and land management approach will be crucial to strengthening food security. The country has invested in water storage infrastructure, irrigation systems, climate-smart agriculture (CSA) and desalination, and it should continue to prioritize expanding and improving the efficiency of its irrigation systems, diversifying the agricultural portfolio toward fruit trees and horticulture, and introducing more drought-resistant crops to enhance food security. Securing additional water sources will require promoting low-carbon desalination, increasing wastewater treatment capacity and reuse, and reducing water losses. Meanwhile, strengthening land ecosystems and integrating forest management with agriculture can create synergies that enhance soil health, recharge groundwater, protect from extreme events, and promote inclusive development.

Creating a climate-smart blue economy

Building a climate-smart blue economy lies at the core of Cabo Verde's development plans. With its pristine beaches, diverse and productive fish stocks, charismatic marine megafauna ranging from tiger sharks to giant manta rays, and an overall healthy marine environment driving growth in tourism and fisheries, Cabo Verde's blue natural capital can be considered foundational to national development. Tourism will remain central to the economy, as it accounts for a quarter of its GDP and 45 percent of formal sector jobs. Yet the sector faces headwinds—from rising temperatures decreasing the country's attractiveness to international travelers, to environmental challenges resulting from poorly planned coastal development, land degradation, increased pollution, and waste generation. Meanwhile, fisheries will remain vital to nutrition, livelihoods, and exports, with fish products accounting for 72 percent of exports in 2021. However, the sector's growth has been hampered by ineffective governance and management, leading to persistent overfishing, depressed fisher incomes, and higher fish prices.

Diversifying the tourism offer, and vigilant stewardship of blue natural capital, are needed to sustain growth in ocean-based sectors. Diversifying the tourism sector by developing new market segments such as hiking, yachting, sport fishing, and creative and cultural tourism is crucial for economic growth and resilience, and efforts should be made to expand tourism's benefits beyond its current geographic concentration in Sal and Boa Vista. Meanwhile, tourism investments should be climate-resilient, including maintaining and retrofitting infrastructure, while the expansion of shore-based tourism must be integrated into broader planning processes to protect coastal resources. On the other hand, ensuring sustainable fish populations will require the establishment of no-fishing zones, regulations that restrict certain fishing techniques, targeted research, and careful monitoring. This could be complemented with aquaculture and diverse production systems like seaweed and shellfish farming. Cross-sector coordination and integrated planning are essential for the sustainable use of Cabo Verde's blue capital.

Protecting urban and transport infrastructure

Given the country's geography and exposure to climate events, securing key urban and transport infrastructure is crucial. Cabo Verde is one of Africa's most urbanized nations, with two-thirds of the population residing in urban areas. Yet urbanization has occurred without proper spatial and climate-informed planning or adequate access to essential infrastructure and services. In Praia, the capital, on Santiago Island, a quarter of the population dwells in informal settlements, vulnerable to climate hazards. On several of the islands, transport infrastructure like roads, ports, and airports are at risk of severe floods. Five of the country's 10 islands could see half of their road networks impacted by a severe flood event. In São Vicente and Santiago, that proportion of the road network is 70 percent and 90 percent, respectively. Extreme weather conditions could also disrupt inter-island connectivity, which already suffers from unreliable service and underdeveloped infrastructure. Extreme weather could disrupt value and supply chains, especially since 83 percent of agricultural areas are in Santiago, Santo Antão, and Fogo, while demand is concentrated in São Vicente, Santiago, Sal, and Boa Vista. Lastly, rising sea levels threaten to submerge vital coastal transport infrastructure, which would impact vital sectors and access to critical facilities like hospitals and schools.

Cabo Verde should prioritize infrastructure investments and better integrate climate considerations into infrastructure planning. The 2024–2030 National Infrastructure Plan (PNI) is evaluating infrastructure gaps to prioritize reforms and investments in transport, energy, water and sanitation, health, and education. Consistent with the PNI, the country should integrate climate considerations into urban planning, update building regulations, implement risk-informed transport asset management, and upgrade priority infrastructure to new standards based on climate projections. Leveraging private investment could present significant opportunities, as seen in recent initiatives to concessionize national airport and port terminal operations.

Accelerating the low-carbon transition to reduce dependency and costs

Although Cabo Verde is a marginal greenhouse gas (GHG) emitter, a low-carbon transition would generate significant economic gains for the country. Even though Cabo Verde accounts for less than 0.002 percent of total global emissions, the country's Nationally Determined Contribution (NDC) still aims to decarbonize the energy sector, which accounts for 73 percent of national emissions, and achieve a 100 percent share of RE penetration by 2040. Decarbonization would increase the country's climate resilience and lower its energy costs, which are among the highest in the region, hindering growth. Although Cabo Verdeans' access rate to electricity is an impressive 96 percent, 80 percent of that electricity is generated from expensive imported fossil fuels. The country, nonetheless, has significant renewable energy potential—more than 3 gigawatts (GW) in solar capacity, and more than 500 megawatts (MW) in wind.

Significant investments and policy reforms are needed to promote a competitive market, leverage private sector investments, and reach national energy targets. The National Program for Sustainable Energy (PNSE) focuses on institutional strengthening, energy market reform, strategic infrastructure development, the promotion of renewable energy, and the enhancement of energy efficiency, while the Electricity Sector Master Plan (2018–2040) sets ambitious renewable energy and storage targets. To achieve them, Cabo Verde should boost public investments for grid upgrades and deploy storage solutions while attracting private capital—which could cover over half of its financing needs—through financial reforms and risk mitigation facilities. Improved sector governance, transparency, and operational efficiency will also be essential. In the long term, interconnecting the islands would facilitate large-scale variable renewable energy (VRE) deployment and the efficient use of storage and RE. This would allow for the gradual decommissioning of thermal plants and reduce the country's dependence on imported fossil fuels, while also meeting the projected increased demand from widescale electric vehicle (EV) deployment.

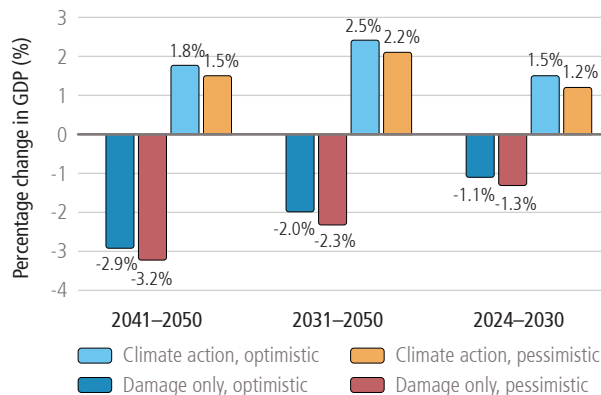
Climate action would boost growth but require private financing

Overall, ambitious and early climate action could reverse climate damage

This CCDR demonstrates that ambitious climate action in Cabo Verde would more than offset the effects of climate change on its GDP. In Cabo Verde’s CC-MFMod, a climate action scenario is designed, integrating key costs and benefits of policies from the sectoral analyses. With climate action, GDP would be between 1.5 and 1.8 percent higher than the baseline in 2050 (figure ES.2), which would more than offset the losses from climate change. Benefits from climate action would be generated primarily through higher tourism and agricultural output, and high aggregate investment, with the effect of the spending stimulus on GDP peaking in 2035. Ambitious adaptation policies, notably to diversify the tourism offer, could offset about half of the projected loss in international tourism arrivals. Large investments in the agricultural sector would boost agricultural productivity, and adaptation to climate shocks would lower infrastructure damage. Combined with ambitious green energy and transport policies, climate investments would support growth. Reflective of this, the poverty headcount would be up to 1.9 percentage points lower with climate action, with the effects differentiated across the islands. That points to the need for adaptive social policies.

Over 2024–2030, the ambitious cross-sectoral climate action scenario would require investments estimated at US\$842 million (discounted) (table ES.1), or US\$140 million a year, which represents 6 percent of cumulative GDP over the same period. Over 2024–2050, investment needs would total US\$2.593 billion, which represents 7.1 percent of cumulative GDP over the same period. About 48 percent of this would come from public sources (figure ES.3), which would increase public spending by about 10 percent a year. This highlights the need for greater domestic resource mobilization. The other approximately 52 percent could come from private sources, highlighting the need to maximize corporate investments amid declining access to concessional financing and high public debt. In areas where public spending will remain the main source of finance, generating fiscal space for climate spending is a priority. In other sectors, such as in the energy, agriculture or tourism, private participation could support the transition. Public sector policies and investments will be vital to unlocking private investment, as would strengthening the financial sector to enhance its ability to channel resources to climate investments.

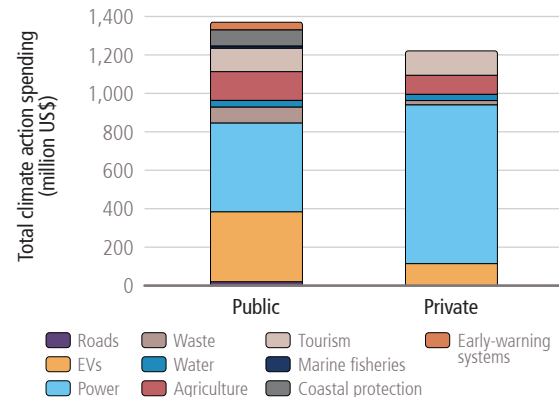
Figure ES2. Average change in GDP over time relative to baseline



Source: Original compilation

Note: The pessimistic scenario refers to the hot and dry climate future; the optimistic scenario refers to the wet and warm climate future.

Figure ES3. Estimated total climate action spending, 2024–2050, by sector



Source: Original compilation.

Climate action would improve Cabo Verde’s resilience against external shocks, notably through large fuel savings, but would increase fiscal pressures. The green transition in the transport and power sectors would greatly reduce fuel import needs, generating savings that could total US\$1.8 billion (discounted) between now and 2050. Climate action would initially increase import needs, but reduce external financing needs in the long term by reducing tourism losses and dependence on fuel and food imports. On the other hand, climate action would exert pressure on public finance, potentially increasing the public debt by 50 pp by 2050. Given the country’s already high public debt, this calls for mobilizing additional revenues and maximizing private sector investment.

Table ES1. Costs and benefits of climate action adaptation and low-carbon development policies

Sector	Key Policies	Costs (million US\$)		Key Benefits
		2024–2030	2024–2050	
Agriculture	Greater irrigated area, use of climate-resilient crops, use of climate-smart practices, mechanization	103.0	244.6	Higher agricultural productivity, reduced import needs
Water	Higher desalination capacity.	14.4	71.0	Increased water availability
Tourism	Diversification of the tourism offer, improved sustainability, communication, governance and skill development.	96.5	254.1	Offsetting of “sea and sun” tourism losses by “nature and culture” tourism gains, enhanced sustainability.
Fisheries	Monitoring and management of fish stocks, communication, enforcement.	5.2	13.7	Offset losses in landed value and income
Coastal Protection	Risk-informed planning and regulations.	32.4	85.7	Avoided disaster risk damage
Risk Prevention	Improved early warning systems	11.9	31.5	Avoided disaster risk damage
Roads	New and climate-resilient roads.	12.5	22.1	Slower depreciation of road capital
Total for Adaptation Policies		275.9	722.6	
Power	Net zero in the sector (cost-effective solution), relative to baseline.	154.0	405.2	Lower fuel imports (US\$ 1.8M by 2050) and air pollution
	Total green investment	416.7	1,281.1	
Transport	Faster substitution of internal combustion engine (ICE) vehicles by EVs, relative to baseline	87.5	148.7	Lower fuel imports (US\$ 1.8M by 2050) and air pollution
	Total investment	126.5	485.4	
Waste	Improved waste management practices	24.2	103.9	
Total for low-carbon development policies		567.4	1,870.4	
Total climate action spending		842.3	2,593.0	

Note: All monetary amounts are in 2023 US\$, discounted at a 6 percent annual rate.

Considering Cabo Verde's large financial needs, mobilizing public and private resources is a priority

For incompressible public climate spending, mobilizing external grants and tax revenues will be vital, in combination with the Government strategically leveraging debt instruments. Financing climate action through public debt accumulation could be costly, and Cabo Verde should maximize external development grants but strengthen domestic resource mobilization to ensure the sustainable financing of climate spending. The Government is looking to green taxation policy to generate additional resources for investment, while a carbon pricing policy could also incentivize the climate transition and simultaneously generate revenue. Cabo Verde's declining access to concessional financing after it became a middle-income country, and its prudent borrowing practices under an International Monetary Fund (IMF) advisory program, mean that it needs to leverage debt resources strategically. Until it can access market or semi-concessional financing again, it should use concessional resources to leverage private capital for climate action. Debt for development swaps are an attractive alternative until borrowing constraints ease, and Cabo Verde could then consider issuing sustainability-linked bonds based on credible sustainability objectives.

The private sector in Cabo Verde is indispensable for mobilizing climate finance, particularly through innovative financing mechanisms and partnerships Opportunities exist to engender resilient, higher-value-added growth by unlocking private investment in high-growth sectors such as fishery, the circular economy, digital services, and most importantly tourism (moving beyond the traditional sun-and-sea offering), as highlighted in International Finance Corporation's (IFC) 2024 Cabo Verde Country Private Sector Diagnostic (CPSD).³ Because of its fragmented geography and the long distances between production sites and consumers, Cabo Verde's economy necessitates efficient air and maritime transport infrastructure and logistics services. Addressing challenges in inter-island maritime and air connectivity represents substantial opportunities for private investment. Additionally, Cabo Verde's strategic geographic position at the nexus of numerous international fiber-optic submarine cables provides a comparative advantage in connecting with Africa, Europe, and South America, enhancing its potential as a hub for digital services. Investment in RE will be crucial for competitiveness. Cabo Verde's privatization and public-private partnership (PPP) program could also attract private capital for infrastructure services under climate considerations, but challenges persist, including transparency issues and flawed concession designs. The government is enhancing the PPP framework and integrating climate considerations, including climate risk assessments and adaptation measures in project design, along with risk allocation strategies and insurance coverage.

Bolstering firms and households' climate resilience will support the transition

Greater climate resilience of firms will promote growth and job creation

Enhancing the climate resilience of firms and engendering economic diversification requires addressing the productivity challenges of firms. Cabo Verde's private sector relies heavily on international investment, making it vulnerable to external shocks and limiting local value chain development, economic growth, and job creation, especially in tourism. Besides tourism, the private sector consists mainly of MSMEs concentrated on three main islands that contribute significantly to national output and formal employment. However, they face significant challenges in accessing finance for climate-smart practices, including high lending rates and inadequate financial infrastructure, which are barriers to firm development. MSMEs like ProEmpresa and ProGarante have been providing much-needed finance and technical assistance. These institutions helped protect thousands of jobs during COVID-19 and could support climate resilience, while their technical assistance has improved financial reporting and credit information systems. Nonetheless, the microfinance sector still struggles with sustainability. To address productivity challenges, there is a need to enhance firm capabilities, improve access to finance, address informality, and promote digitalization.

Social protection and skills development are vital to support households

Cabo Verde has an advanced social protection system but needs better shock-responsive mechanisms. Skills development is vital to prepare the country's workforce for new opportunities. Enhancing safety nets should involve strengthening the social registry, institutionalizing emergency cash transfers, linking the safety nets with disaster risk management, and including an enhanced role for women's leadership in community preparedness efforts. While the country's emergency cash transfer program, RSIE (*Rendimento Social de Inclusão Emergencial*), provides immediate aid during shocks, it needs improved activation mechanisms and more targeted beneficiary criteria. With climate change affecting multiple sectors, the need for a skilled, adaptable, and informed workforce is also pressing. Investing in education and skills development can enhance climate literacy, incentivize green entrepreneurship, and enable the population to adopt more sustainable practices.

Finally, closing the employment gender gap could significantly boost growth and resilience. Despite higher educational attainment rates, women's labor force participation (LFP) rates still lag those of men by 14 points because of social norms, life cycle constraints, and inadequate childcare services, with the gap particularly pronounced in rural areas. Supporting women entrepreneurs in green sectors is crucial, including by addressing gender constraints on access to finance and productive assets, and ensuring gender-responsive planning and budgeting.

Institutional and legal reforms would facilitate climate action

To enable effective action and financing, Cabo Verde's legal and institutional framework and coordination also need strengthening. The country lacks a comprehensive framework law for national climate change. Weak climate change legislation at the subnational level leads to fragmented efforts and unrealized goals, and limited coordination among government entities hampers progress even further. The National Planning Directorate, DNP, under the Ministry of Finance, supports integrating adaptation into national and local planning and budgeting processes but this policy-driven approach lacks a legally binding framework that clearly assigns responsibilities and mandates, limiting the ministry's ability to enforce climate change directives across sectors. Strengthening the legal structure to formalize roles, grant legislative power to agencies, and establish coordination protocols would enhance climate governance.

Recognizing these challenges, the government developed a new governance framework in 2024. In May 2024, it established a new climate change law and a comprehensive climate governance framework to address previously identified gaps. The framework's effectiveness will depend on enacting binding legislation, clarifying institutional roles and responsibilities, and creating robust enforcement and public accountability mechanisms. Although the NDC is setting a solid foundation, further work on legal instruments, institutional mandates, and subnational legislation will be crucial for ensuring effective, comprehensive climate action. Strengthening the framework for participating in carbon markets, including monitoring, reporting and verification (MRV) systems, may also open new opportunities for climate finance.

Recommendations

Based on the findings from this CCDR, a set of recommendations have been structured around seven high-level objectives. These objectives are aligned with the report's conceptual framework. The recommendations build on the technical recommendations identified throughout the report and summarized at the end of each chapter together with the time frame for implementation, key barriers, key actors, financing sources and progress indicators. Table ES.2 offers a snapshot of the recommendations.

Table ES2. High-level objectives and recommendations

HL01	Build a robust, climate-resilient legal and institutional framework to achieve national climate goals
★ 1.1	Enact a new climate change law and align local legislation with national climate objectives.
1.2	Develop a robust legal and institutional framework, enhance capacity and public engagement, integrate climate obligations, strengthen enforcement, and include climate in the Environmental and Social Impact Assessment (ESIA) framework.
1.3	Strengthen the legal framework for carbon markets.
HL02	Mobilize climate finance
★ 2.1	Sustainably bring down public debt levels, create fiscal space and channel public spending to crowd in private sector.
2.2	Maximize corporate investments, particularly in tourism, digital services and energy. Diversify the financial sector.
2.3	Scale up the existing infrastructure for the market-based financing of climate investments.
HL03	Adopt integrated land and water management
★ 3.1	Safeguard freshwater resources, reduce losses and invest in low-carbon desalination and wastewater reuse.
3.2	Promote CSA practices, irrigation, and diversification.
3.3	Integrate forest management with agriculture and tourism, support community-led afforestation and reforestation.
HL04	Develop a climate-resilient blue economy (tourism, fishery, ocean)
★ 4.1	Support research and monitoring of fish stock.
4.2	Promote sustainable fishery through regulations, no-fish zones for regeneration, and standards and certification for processed fish, while increasing aquaculture.
★ 4.3	Diversify the tourism offer beyond beach and sun to include hiking, yachting, cultural exploration, and creative initiatives, and reduce the environmental and carbon footprint of the tourism sector. Protect coastal ecosystems, and promote climate change adaptation in the private sector.
HL05	Build more climate-resilient and inclusive infrastructure systems
★ 5.1	Develop risk informed national infrastructure planning, and update building regulations for new infrastructure.
5.2	Upgrade existing connectivity infrastructure and implement risk-informed transport asset management.
5.3	Improve inter-island connectivity.
5.4	Build resilience in digital infrastructure, enhance climate monitoring and ICT services.
HL06	Advance the green transition in the energy, transport and waste sectors
★ 6.1	Increase RE penetration, modernize the grid, and invest in storage capacity.
6.2	Complete sector demerger and privatization of the energy operator, build institutional capacity, and advance on incentives regulation.
★ 6.3	Mobilize private funds through derisking facilities, project pipeline development, transaction advisory support, procurement strategies to aggregate small projects.
6.4	Achieve e-mobility targets on public fleet and public charging infrastructure, and enact supportive policies and regulations for private e-mobility.
6.5	Deploy integrated waste management systems, invest in engineered landfills and expand recycling. Promote separation at source.
6.6	Improve waste regulations and financing, including tariff system and leverage partnerships between public, private and third sector.
HL07	Support households and firms to build resilience
7.1	Enhance the social protection system's efficiency, coordination, and responsiveness to climate-related shocks by strengthening the social registry, the cash transfer program and early warning systems.
★ 7.2	Build skills in high-value green sectors by integrating climate into school curricula. Expand vocational training and introduce learning programs that support green entrepreneurship, with a special focus on women and youth.
★ 7.3	Expand disease surveillance and early-warning systems to include climate-sensitive diseases.
★ 7.4	Enhance MSMEs' access to climate finance, promote economic diversification, and integrate climate considerations into PPP projects.

Note: ★ = Urgent



1. Development and Climate Goals

1.1. Cabo Verde's Socioeconomic Development Pathway

Since the early 1990s, Cabo Verde has made significant social and economic progress, but in recent years it has faced headwinds from structural factors, slow productivity growth, and the COVID-19 pandemic. Located 500 km off the west coast of Africa, Cabo Verde is an archipelago of ten islands with a population of 556,000. Politically stable, the country is considered a good example of democracy in Africa. The largest island, Santiago, has half of the country's population. Economic growth is primarily driven by services—80 percent of GDP, compared to 14 percent for industry and 6 percent for agriculture—most notably the tourism sector, which accounts for a quarter of GDP, attracts the most foreign direct investment, and generates spillovers into other sectors of the economy such as agriculture, fishery, and services (figure 1.1).

Growth, which has been robust but volatile, slowed from an annual average of 7.5 percent in the 2000s to 2.9 percent in the 2010s because of structural rigidities and limited productivity growth (figure 1.2). COVID led to a significant contraction in 2020, but GDP recovered to its pre-pandemic level by 2023, growing by 5.1 percent as a result of vigorous private consumption and a full recovery of the tourism sector.

Cabo Verde has high public debt and relies extensively on tourism revenues, remittances, and food and fuel imports, resulting in vulnerabilities. Cabo Verde experiences recurrent fiscal deficits, which averaged 2.7 percent of GDP in 2015–2019, but rose during the COVID pandemic. This caused already elevated levels of public debt to rise to 148 percent of GDP in 2021, before settling down to 113.8 percent in 2023, reflecting deep cuts in public investment despite otherwise rigid public spending.

With recurrent current account deficits (3.6 percent of GDP in 2015–2019) and significant product trade deficits (29.9 percent of GDP over the same period), Cabo Verde's development model relies heavily on external financing. Those deficits are driven by the country's high volume of imports, and only partially offset by large tourism receipts (20.1 percent of GDP) and remittance inflows (17 percent of GDP) (figure 1.3). The economy also relies extensively on imported food and petroleum products, which, before COVID, accounted for 24.9 and 10 percent of product imports, respectively. Volatile revenues drive volatile external balances, and plummeting tourism revenues during the pandemic caused services export to halve as a share of GDP. Additionally, in 2020–2021, the current account deficit reached 15.1 percent of GDP, despite surging remittances, before returning to its pre-COVID levels in 2023.

Food and fuel imports are also sources of vulnerability, as was made clear in 2022, when the food and fuel import bill, driven by surging commodity prices, shot up by 68 percent over their pre-COVID average (figure 1.4). Concessional external financing remains a major source of public financing, given the country's lack of access to international capital markets and its relatively costly domestic debt.

Over the last two decades, pro-poor income growth has kept the goal of ending extreme poverty in Cabo Verde within reach. The poverty headcount fell from 58 percent in 2001 to 27.7 percent in 2019. Economic growth during this period was driven by urbanization and structural change, with less well-off households benefiting disproportionately from the expansion of the economy. However, the coronavirus pandemic, Russia's invasion of Ukraine, and climate change have unveiled the vulnerability of nonpoor households to falling back into poverty in the aftermath of a shock. The pandemic contracted the economy by 14.8 percent and severely affected the tourism sector, which employs many from poor and vulnerable households, raising the poverty rate by up to 3.6 percentage points. Additionally, the compound effect of a prolonged drought and Russia's invasion of Ukraine raised food prices by 15 percent, leaving at least 10 percent of the population suffering from acute food insecurity. Although the country is recovering well from recent

shocks, its heightened exposure to external shocks and volatility in growth make diversifying the economy and enhancing household resilience urgent priorities if the target of ending extreme poverty in 2026 is to be reached.

Figure 1.1. Cabo Verde's economy is services-driven

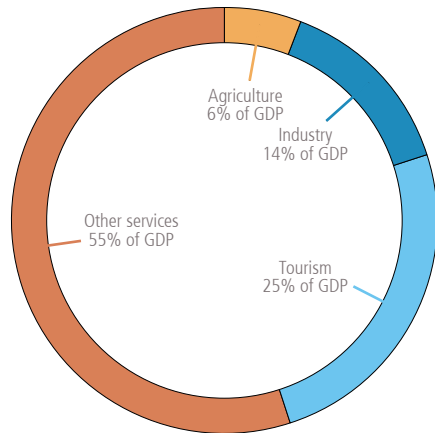
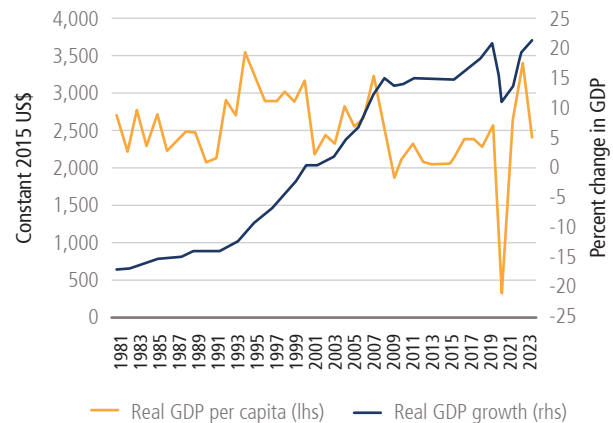


Figure 1.2. Growth has been robust but volatile



Source: Original compilation based on an Instituto Nacional de Estatística de Cabo Verde (INE) 2024 publication

Note: Annual averages taken over the 2015–2019 period and represented as a percentage of GDP.

Figure 1.3. Fiscal deficits fell, but public debt remained high

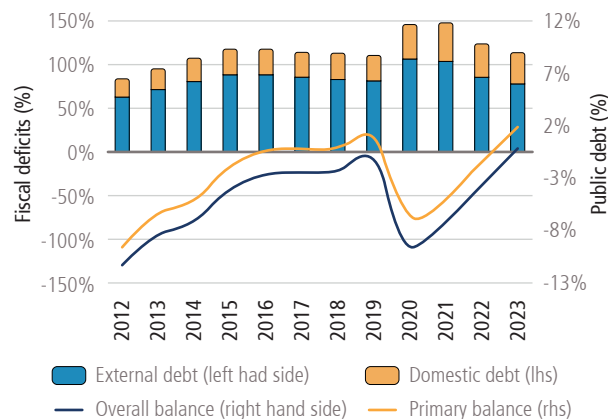
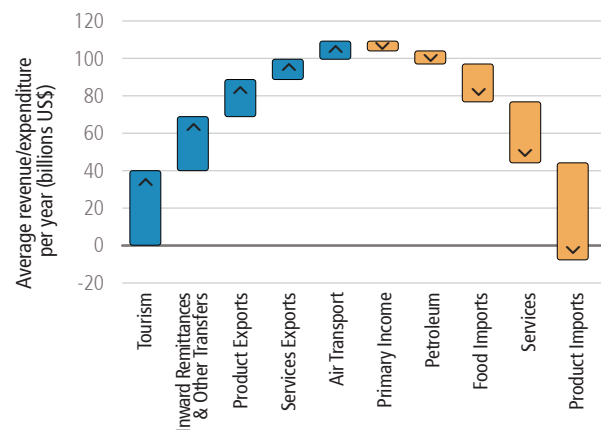


Figure 1.4. Reliance on tourism, remittances and imports is a source of external vulnerability



Source: Original compilation based on an Instituto Nacional de Estatística de Cabo Verde (INE) 2024 publication

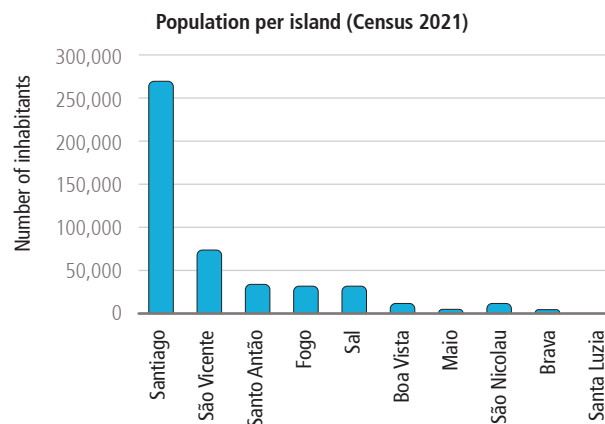
Note, figure 1.4: The CVE amounts are annual averages taken over the 2015–2019 period. Blue = exports and positive transfers account (largely due to significant remittances). Orange = imports and negative primary income account.

In the wake of the pandemic, the government has launched an ambitious development strategy. The second Strategic Plan for Sustainable Development 2022–2026 (*Plano Estratégico de Desenvolvimento Sustentavel, PEDS II*)⁴ emphasizes the need for private sector-driven economic diversification and a strong post-pandemic recovery. While the government acknowledges the continued importance of tourism to the country’s economy, PEDS II envisions that, because of its strategic geographic location at the nexus of several international trade lines, Cabo Verde will generate its most rapid and sustainable growth if it becomes a hub economy for the mid-Atlantic region—that is, a network aggregation or connection point

that facilitates, and to a degree controls, the flow of goods, services, carriers, and information to and from multiple global regions by providing a concentration of information technology (IT) and logistics services.⁵ PEDS II also emphasizes human capital development, social inclusion, gender equality, and environmental sustainability to create a prosperous, inclusive nation by 2026.

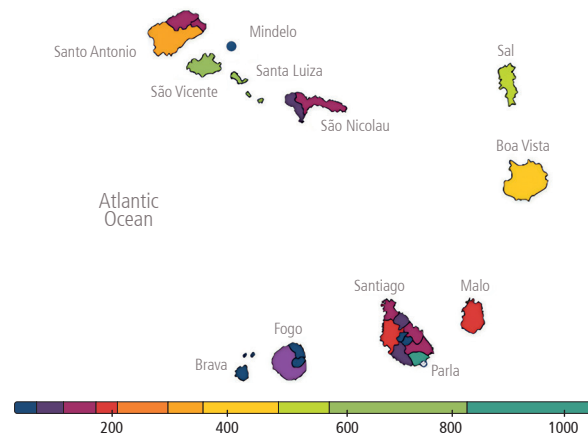
Militating against this development strategy, Cabo Verde’s archipelagic geography and sparse population present great challenges to the equitable provision of infrastructure and essential services. Half of Cabo Verde’s population is located on Santiago Island (269,000), with 13 percent on São Vicente (74,000). The populations of the other eight islands do not exceed 40,000 inhabitants each (figure 1.5). Inequalities are observed both within and among the islands, between urban and rural areas, and within cities. For instance, in the urban areas, 90 percent of the population has access to clean water and 59 percent has access to adequate basic sanitation services. In the rural areas, these figures drop to 72 percent and 33 percent, respectively.⁶ The disparities in infrastructure provision are also evident in the concentration of economic activity on the islands of Santiago, São Vicente, and Sal (figure 1.6). Together, in 2018 these accounted for 75 percent of the firms operating in the country, 95 percent of national output, and 85 percent of formal sector jobs.⁷ Currently, more than 80 percent of tourist demand is concentrated in the well-established sun-and-beach resorts on the islands of Sal and Boa Vista. Addressing territorial inequalities and strengthening inter-island connectivity are therefore crucial in promoting balanced regional development and reducing socioeconomic disparities throughout the country. Spatial disparities extend to the labor market. For example, the gaps between men’s and women’s labor force participation rates are wider in the rural areas than urban.

Figure 1.5. Santiago Island hosts half the population



Source: Instituto Nacional de Estatística de Cabo Verde (INE) 2024 publication

Figure 1.6. Economic activity is concentrated on a few islands



Source: National Oceanic and Atmospheric Administration (NOAA) and National Centers for Environmental Information (NCEI), “Mean NTL (nighttime lights) value at the conselho level, 2013–2020,” VIIRS dataset (2024). World Bank staff estimates.

Disaster risks and extreme climate events are additional obstacles hindering Cabo Verde’s sustainable development. Because of its location and geography, Cabo Verde is exposed to a large range of natural hazards, including volcanic eruptions, droughts, landslides, coastal erosion, sea level rise, and floods. These risks are compounded by high rates of rural–urban migration, land degradation, poor inter-island connectivity, persistent poverty, and high indebtedness. Between 1980 and 2020, adverse natural events were associated with a decrease in GDP per capita of almost 1 percentage point, on average, during the year of impact.⁸

Cabo Verde’s disaster risk profile, economic structure, and macroeconomic vulnerabilities render it especially sensitive to climate change. As a small island developing state (SIDS), Cabo Verde is among the countries most vulnerable to the effects of climate change. Climate change is expected to exacerbate hydrometeorological hazards, notably increasing sea levels and the risk of coastal flooding. Meanwhile, more frequent extreme climate events could increase the costs of damage to urban and transport infrastructure—the foundation of the archipelago’s balanced and sustainable development. In addition, hotter and drier weather could affect its attractiveness as a tourist destination, as well as reduce the agricultural output of rainfed crops, notably that of vegetables, which would pose risks to food security.

Additionally, the biophysical risks will be compounded by Cabo Verde’s reliance on international sources of revenue and financing, even as its ability to respond to those risks is currently constrained by high levels of public debt. Climate change is expected to affect each island differently. For instance, even though Santiago, São Vicente, São Nicolau, and Santo Antão comprise only 70–75 percent of the national population, together they account for 98 percent of the national flood-exposed population. By contrast, Sal and Boa Vista, which make up only 7–8 percent of the national population, accounted for over 80 percent of tourism arrivals in 2023, underscoring their outsized role in the national economy and their heightened vulnerability to climate impacts on the tourism sector.

1.2. Climate risks and socioeconomic impacts of inaction

Scenario models help to understand the impacts of climate change

To estimate the impact of climate change on the Cabo Verde economy, a long-term macroeconomic projection model was developed to model impacts with and without ambitious climate action. The Climate Change Macro-Fiscal Model (CC-MFMod) is a macro econometric model used to produce forecasts up until 2050 for growth, fiscal, external and emission variables. To that effect, a baseline projection is defined, assuming no further deterioration in climate and climate damage beyond that experienced historically.

Figure 1.7. Temperatures rise significantly under both pessimistic and optimistic scenarios

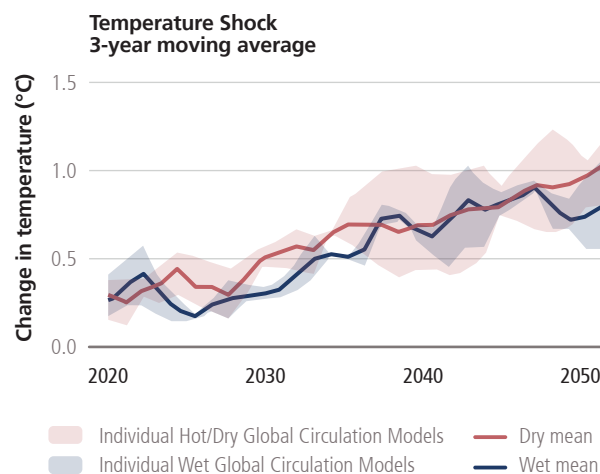
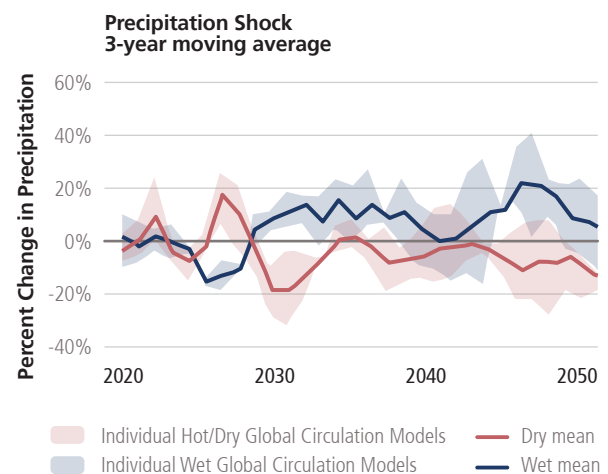


Figure 1.8. Precipitation increases in the wet scenario and decreases in the dry scenario



Source: World Bank, Climate Change Knowledge Portal, last accessed December 18, 2024, <https://climateknowledgeportal.worldbank.org>.

Various forms of climate change damage are then introduced, running through eight channels, across a pessimistic and an optimistic scenario. Six global climate scenarios are selected,⁹ aggregated into two futures: a more optimistic warm and wet future, and a more pessimistic hot and dry future. Under both climate scenarios, the increase in temperature is estimated at around 1.0 degree Celsius by 2041–2050 relative to the 1995–2020 baseline (figure 1.7) and would be relatively uniform around the country. However, under the dry scenario, Cabo Verde experiences a 6.6 percent decrease in precipitation relative to the baseline, while the wet scenario projects an 8.9 percent increase in precipitation (figure 1.8).

The damage of climate change to the economy is modeled through eight channels that affect output, productivity and physical assets. Over time, Cabo Verde is projected to face an increase in heatwaves and unpredictable rainfall patterns, leading to increased risks of floods and droughts, in addition to rising sea levels, impairing the country’s physical infrastructure. Furthermore, agricultural output is expected to be affected by lower rainfall and higher temperatures, and marine fisheries by changing sea temperature and currents, while the archipelago’s economy could suffer from the effects of heat on labor productivity. Crucially, the tourism sector, which accounts for over 25 percent of GDP, could see increased heat in already hot regions, resulting in a decrease in international tourist arrivals and a shift in domestic leisure travel to international destinations. These projections are modeled through eight channels, which are summarized in table 1.1.

Table 1.1. Eight climate channels and their impacts in the model

Impact Channel	Channel Description	Effect in CC-MFMod
Rainfed crops	Lower rainfall decreases yields	Output Loss
Fisheries	Higher water temperatures	Output Loss
Tourism	Reduction in tourism demand	Output Loss
Heat Impacts	Heat decreases productivity of outdoor workers	Productivity Loss
Road	Damage from heat and climate events	Capital stock and productivity loss
Bridges	Damage from heat and climate events	Capital stock and productivity loss
Urban Flooding	Damage from intense rainfall	Capital stock loss

Simulation results

Over 90 percent of the projected damage to GDP can be attributed to lower tourism revenue, mainly through fewer international arrivals. Increased temperatures under both wet and dry scenarios would lower tourism earnings by around 10 percent by 2050.¹⁰ This result is driven mainly by international tourist arrivals, which account for an estimated 79 percent of sector revenues, and would decline more markedly than domestic leisure and business travel. Since tourism revenues account for 40 percent of exports and a third of the services sector, the effects on GDP, the current account balance, and tax revenues would be significant (figure 1.9 and figure 1.10).

Revenue losses in the agriculture sector would also be significant, driven by lower rainfed crop output. Lower rainfall would reduce rainfed crop output by over 10 percent in the dry scenario, with revenue losses being larger for vegetables (46 percent of rainfed crop revenues), banana and tropical fruits, which would

experience a steeper decline in output).¹¹ On the other hand, changing water temperatures and fish population dynamics would lower marine fisheries production. Lastly, the effects of greater heat on the productivity of outdoor workers would be moderate, but more acute in the agricultural sector. Yet because the agricultural sector accounts for only 6 percent of GDP, climate damage to rainfed agriculture, marine fisheries and worker productivity have modest aggregate effects on growth—although the effects on household incomes would be more marked (see section 1.3).

Figure 1.9. Change in revenue from leisure travelers under two climate scenarios, 2041–2050, relative to baseline

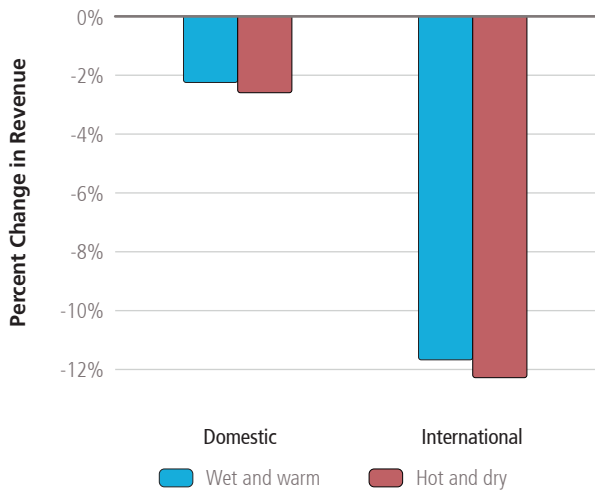
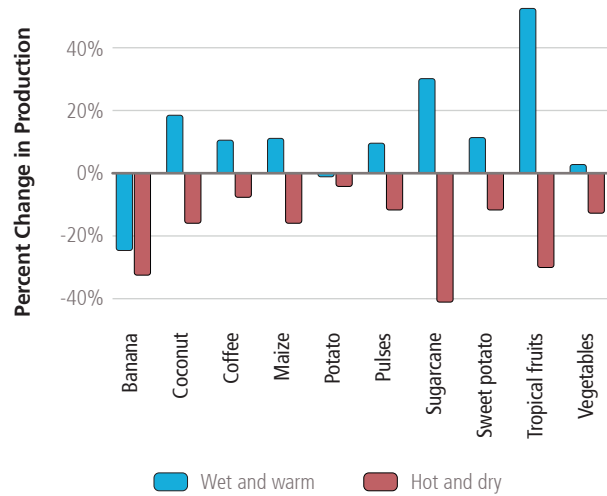


Figure 1.10. Production change, by rainfed crop, 2041–2050

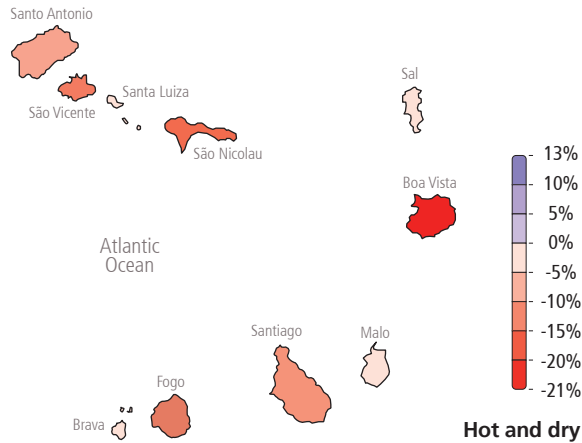


Source: Original Compilation

It is projected that Cabo Verde's capital stock and productivity, already highly impacted by extreme climate events, will be subject to only moderate aggravation under all climate scenarios. On average, between 1980 and 2020, adverse natural events are associated with a decrease in GDP per capita of almost 1 percentage point during the year of impact, highlighting the archipelago's existing significant exposure to extreme climate events.¹² Almost 70 percent of these losses are driven by flood-related risks, based on current climate patterns. Given the already existing level of damage, further climate change up until 2050 is expected to lead to only a moderate increase in infrastructure damage, with the exception of coastal areas where the increase will be more marked.

Climate change will have differentiated effects across Cabo Verde's islands, reflecting differences in their economic structure, geographic characteristics, and location. Sal and Boa Vista, which are more dependent on tourism revenues (figure 1.12), would suffer most from declining tourism arrivals, although sectors that supply the tourism industry throughout the country would also be affected. Santiago, Santo Antão and Boa Vista would contribute the most to the decline in agricultural output and decreased outdoor worker productivity, with Boa Vista the most severely affected (see figure 1.11). Santiago island, accounts for most of the archipelago's infrastructure, could account for the most damage to capital stock. Yet sea-level rise will have more severe effects on the low-lying islands, namely Sal, Boa Vista, and Maio, and impacts on roads would be concentrated in the northern islands of Santo Antão and Sal.

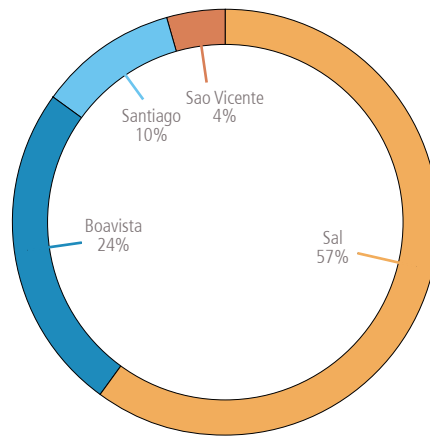
Figure 1.11. Impact of altered water availability and increased heat stress on the yield of Rainfed Vegetables



Source: Industrial Economics Incorporated, Estimating the Economic Damages of Climate Change in Cabo Verde, unpublished report (Cambridge, Massachusetts: IEC, 2024)

Note: Yield is relative to the baseline for the hot/dry scenario. Light grey = no known production of vegetables on that island, as per IFPRI SPAM crop

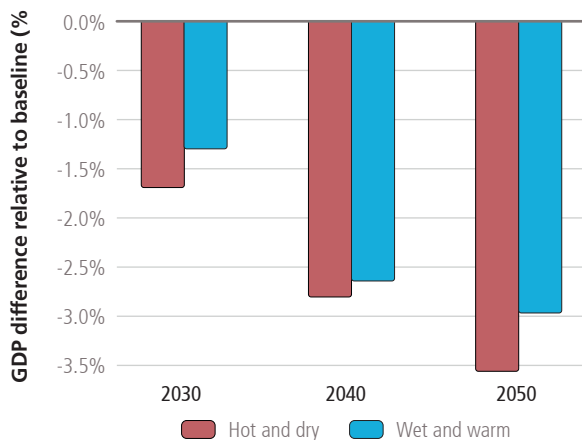
Figure 1.12. Visitors per island, 2023



Source: Instituto Nacional de Estatística, *Estatísticas do turismo: Movimentação de hóspedes, ano 2023* (Instituto Nacional de Estatística, 2023), <https://www.ine.gov.cv>

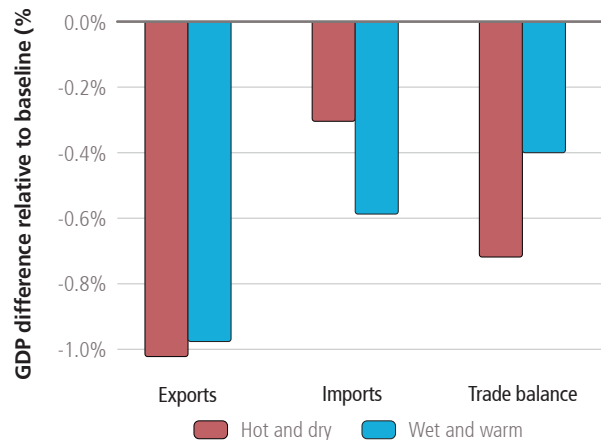
Beyond its impact on growth, deteriorating climate has important implications for Cabo Verde's long-term investment, import, and external financing needs. It is projected that, by 2050, under both climate scenarios, exports will be 1 pp of GDP lower than they otherwise would be. In addition to this, the tourism sector is the main beneficiary of foreign direct investment and a key source of international reserves. Cabo Verde's import needs are also expected to increase owing to depressed rainfed agriculture production and higher imports to replace capital stock damaged by climate change and extreme climate events. As a result, climate change will gradually increase Cabo Verde's external financing needs. Also, given the weight of tourism in the economy, tax revenues could decrease at the same time that spending needs to address the economic and social consequences of climate change arise.

Figure 1.13. In both climate change futures, GDP declines



Source: Original compilation based on IEC (2024).

Figure 1.14. The trade balance deteriorates more in the hot and dry scenario by 2050, given higher import needs



1.3. Poor rural dwellers and women are most affected by climate change

Cabo Verdeans are already highly exposed to the consequences of extreme climate events, the poor and vulnerable disproportionately so. Estimates of the impact of climate change on poverty tend to focus on its impact over the coming decades,¹³ but the risk of extreme weather events is already high. Analysis that combines geospatial data and climate projections¹⁴ suggests that one in five Cabo Verdeans is currently at risk of being affected by extreme events, with about 16 percent of the population being exposed to extreme droughts and 7 percent to extreme floods. Poor households are disproportionately exposed to droughts—their risk is 1.4 times higher. By contrast, the risk of extreme floods is relatively balanced between income levels (figure 1.15).¹⁵ An example is the long-term drought that affected Cabo Verde between 2017 and 2022, putting up to 10 percent of the population at high risk of food insecurity.¹⁶ Exposure to extreme droughts affects all islands but to a lesser extent São Vicente and Sal (figure 1.16).¹⁷ On the other hand, those vulnerable to extreme floods are more spatially concentrated, with 90 percent of them in Santiago and Santo Antão. The country’s already high exposure to these extreme events underscores the importance of taking immediate action, in particular, tailored adaptation strategies to enhance household resilience to floods and droughts.¹⁸

Figure 1.15. The poor are disproportionately exposed to extreme events, especially droughts

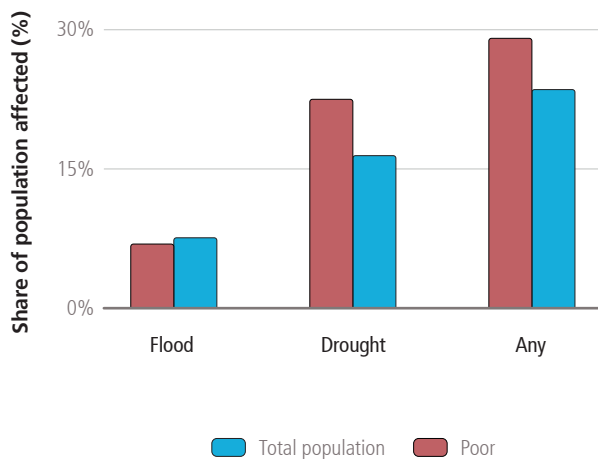
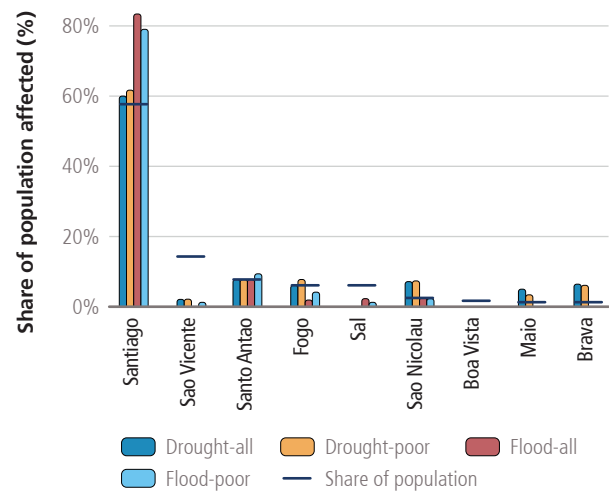


Figure 1.16. Exposure to droughts is more dispersed across islands than exposure to floods



Source: Original elaboration based on IDRF-III and Doan et al. *Counting People Exposed to, Vulnerable to, or at High Risk from Climate Shock*.

Note: Drought is defined here as an event with a 40-year return period (>30 percent of cropland or pastures affected in rural areas). Flood (>0.5 meters of inundation depth), heatwave (>33 Celsius 3-day mean maximal Wet Bulb Globe Temperature) and cyclone (≥ Category 2 wind speed) are events with 100-year return period. The exposure of the poor is computed on the island-area of residence level (that is, urban–rural).

Absent climate action, changes in temperature and precipitation will increasingly affect the livelihoods of already poor Cabo Verdeans. Climate change damage to household well-being accelerate over time, with the impact in 2050 being four times the impact projected in 2030. By 2050, the poverty headcount, measured by the national poverty line, could rise by 0.6 to 1 percentage points in both the wet and warm and the dry and hot scenarios. This implies an annual increase in the number of people living in poverty in the range of 4.1 to 6.4 percent (figure 1.17). This rise in the poverty headcount does not show the deeper

impact that climate change has on already poor households. According to the poverty gap, the welfare of poor households is expected to worsen by 4.4 to 6.8 percent due to climate change. The monetary losses represent a lower bound of the total losses because they overlook how climate affects households through extreme events, non-monetary measures of well-being, and the long-term effects on future generations. For instance, it does not account for how climate change disrupts the human capital investments poor households made in their children today.

Climate change affects livelihoods through its direct and indirect effects on the returns to labor, the main asset the poor count on. In Cabo Verde, direct impacts, such as reduced productivity from heat stress or lower crop and livestock yields due to droughts and erratic rainfall, affect returns to agricultural workers. However, these are not the central drivers of the increase in poverty in Cabo Verde, because the effect of this scenario in isolation is around one-tenth of the total effect on poverty across all years and all scenarios. An important driver of the decline in wages is an economy-wide demand contraction rooted in the impact of climate change on tourism, a sector with significant input-output links with the rest of the economy. The impact of climate change on poverty through tourism is almost nine times larger than the impact it would have through crop and livestock yields only, or through declines in labor productivity (figure 1.18). The significance of the tourism sector suggests that women would be disproportionately affected, as they constitute approximately two-thirds of the workforce in tourism-related industry sectors such as hotels, restaurants, and retail.¹⁹ This places women, especially employed women, at the forefront of those most impacted by climate change.

Figure 1.17. The impact of climate change on the incidence and depth of poverty accelerates over time

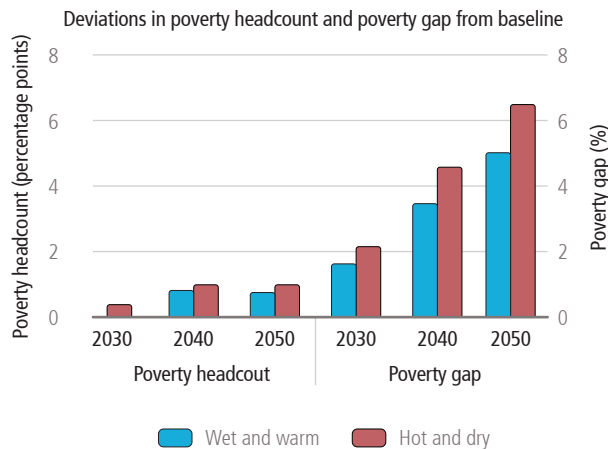
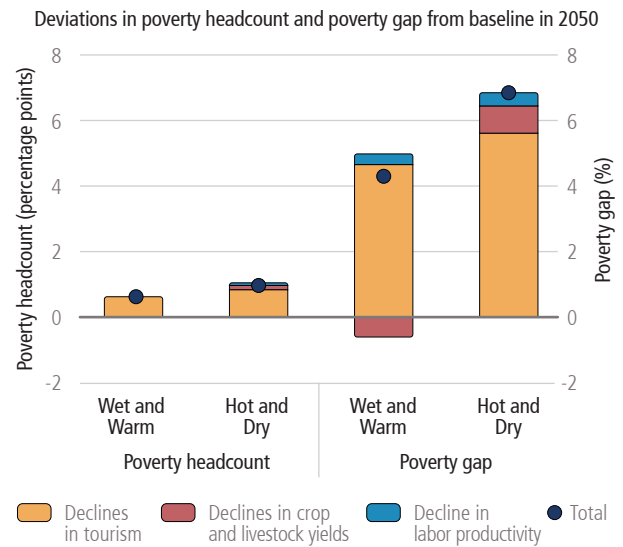


Figure 1.18. The impact of climate change on the incidence and depth of poverty accelerates over time



Source: Original compilation based on IDRF-III microdata, and a consistent set of macroeconomic projections obtained from CC-MFMOD and biophysical damage function²⁰

Note: The figure reports the difference in poverty projections between climate scenario and the baseline, absent climate change. Only the main three main channels are considered and scale up to match the global decline when all the channels are considered.

1.4. Emission profile and associated externalities

Cabo Verde's global emissions contribution is minimal, with per capita emissions comparable to other similar SIDS. Cabo Verde is the 189th on the list of largest greenhouse gas (GHG) emitters, accounting for less than 0.002 percent of total global emissions. Its per capita emissions are in line with those of several SIDS peers such as Samoa and Micronesia.²¹ Per capita emissions in 2019 were around 1.82 tons of carbon dioxide equivalent (tCO₂eq), a 75 percent increase since 1995 (figure 1.19). This is still significantly lower than the global average of 4.8 tCO₂eq in 2019. Carbon dioxide (CO₂) is the main GHG emitted, accounting for 73.3 percent of the total in 2019, and comes predominantly from the burning of fossil fuels in the energy sector. Methane (CH₄, 16 percent) and nitrous oxide (N₂O, 8 percent), originating from the agricultural and waste sectors, account for most of the remainder.²²

The energy sector is responsible for over 70 percent of national GHG emissions, followed by the agricultural and waste sector. In 2019, national GHG emissions totaled 910.7 Gg CO₂eq, which includes the absorptions by the land use, land-use change, and forestry (LULUCF).²³ The energy sector, led by energy production (43 percent of energy sector emission) and transport (40 percent), accounted for 72.7 percent of the total.²⁴ The waste sector accounted for 18.7 percent, half of it from the open-air burning of waste.²⁵ The agricultural sector represented 12.3 percent, almost entirely from the livestock sector, while industrial processes and product use (IPPU) accounted for 2.9 percent (figure 1.20).

Figure 1.19. Per capita GHG emissions have risen by 75 percent since 1995

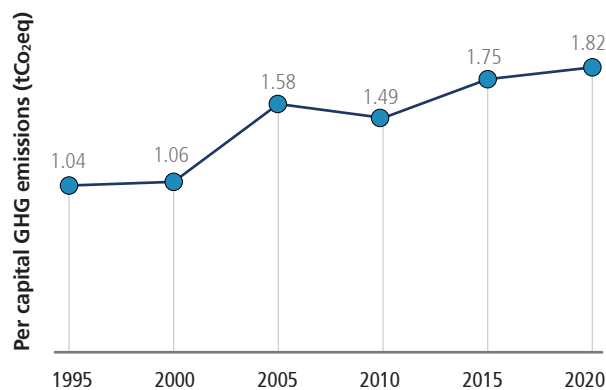
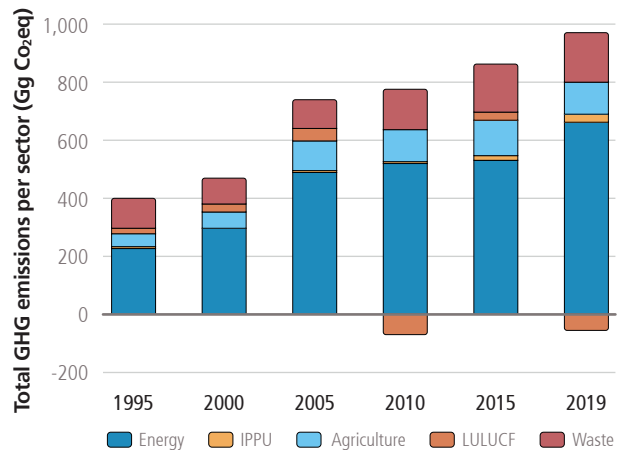


Figure 1.20. The energy sector releases 73 percent of total GHG emissions



Source: United Nations Framework Convention on Climate Change, Cabo Verde's First Biennial Update Report (Bonn, Germany: UNFCCC, 2023) https://unfccc.int/sites/default/files/resource/BUR_EN_Digital.pdf.

1.5. Opportunities for a greener, more resilient and inclusive development pathway

This CCDR lays out a cross-cutting climate action strategy for Cabo Verde to respond to the challenges posed by climate change. It seeks to proactively identify a path to low-carbon, resilient, and inclusive development, with a greater role for the private sector. In chapter 2, it reviews the enabling environment for climate action, putting forward key policy options to enable the transition. In chapter 3, the report dives into key sectors of the economy—water and agriculture, the blue economy—and reviews infrastructure challenges, identifying

policies for adapting to and countering the economic consequences of climate change. In chapter 4, the CCDR proactively puts forward a resilience-enhancing green transition path for Cabo Verde, identifying investments in the energy, transport and waste sectors to drive the transition while generating benefits in the form of higher productivity, lower import needs, reduced fuel consumption, lessened greenhouse gas emissions, greater employment opportunities, and less local pollution. Chapter 5 tackles the challenge of building the climate resilience of firms and households.

The report quantifies the costs and benefits of climate action policies that were identified in the sectoral deep dives. Chapter 6 brings together into a single into a “climate action” scenario the CCDR’s adaptation and mitigation policy recommendations. Compiling the costs and benefits of this scenario, the report presents the benefits of climate action for the Cabo Verdean economy and population, while laying out possible avenues for financing ambitious investments in climate resilience.



2. The Enabling Environment for Climate Action

2.1. Cabo Verde is committed to combating climate change

Despite contributing less than 0.002 percent to total global emissions, Cabo Verde has made significant international commitments to combating climate change. These commitments are demonstrated through the country's ratification of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement. Cabo Verde's Nationally Determined Contribution²⁶ was updated in 2021, and the country's Fourth National Communication and First Biennial Update Report were recently submitted,²⁷ together with the Enhanced Transparency Framework. A Long-Term Low-Emissions Development Strategy is currently being prepared under the leadership of the Ministry of Agriculture and the Environment (MAA), with a focus on reducing the costs of energy, waste management, and low-carbon, resilient development. The strategy will act as a link between the shorter-term goals of the NDC and the country's longer-term climate and development objectives, and will direct the decision making needed to achieve net-zero emissions.

The importance of addressing climate change is integrated into Cabo Verde's national development plans. Cabo Verde's Second Strategic Plan for Sustainable Development 2022–2026 (*Plano Estratégico Desenvolvimento Sustentavel II/PEDS II*)²⁸ recognizes the country's vulnerability and prioritizes building resilience in the context of medium- and long-term climate change impacts by promoting (i) energy efficiency and conservation in buildings, transport, and industries; (ii) the use of renewable energy to replace fossil fuel-based energy generation; (iii) a transition to low-carbon transport systems, including through electric vehicles, public transport, and nonmotorized transport; and (iv) policies and regulations to reduce emissions from industrial processes, cleaner production techniques, and circular economy principles, among other objectives. PEDS II builds on the progress of the first plan (PEDS 2017–2021) and aims to achieve the goals of the sustainable development path established in the government's flagship strategy "Ambition 2030."

Cabo Verde's updated NDC is ambitious. In the area of GHG emissions, Cabo Verde seeks to achieve a substantial mitigation benefit, between 180,000 tCO₂eq and 242,000 tCO₂eq annually, by 2030. The energy sector, which accounts for over 70 percent of total emissions, is key to achieving emission reductions and a decarbonized net-zero economy by 2050. Leveraging its significant solar and wind resources, Cabo Verde aims to achieve a 30 percent share of RE penetration by 2030.²⁹ With international support, the plan is to reach 100 percent of this target by 2040. Additionally, the stated goal of the NDC is to limit the increase in energy demand to 3 percent per year from 2020 to 2030, and to reduce losses in energy distribution to less than 8 percent by 2030, from about 25 percent in 2010. Recognizing the country's vulnerability to climate change, the updated NDC focuses on enhancing the country's climate resilience by improving water security and natural replenishment while reducing water carbon intensity; enhancing sewage, solid waste, and wastewater treatment; and increasing and sustaining both land-based and ocean-based food security through regenerative agriculture and fishing. Further goals include extending marine protected areas, defending marine resources and coastal zones, and using spatial planning in mitigation and adaptation, together with mitigating climate-related disaster risks and climate-related health risks. Climate-relevant investment projects in PEDS II support these NCD targets. The dedicated environment pillar of PEDS II emphasizes the importance of implementing strategies for increased resilience, reduced vulnerabilities, and prioritized adaptation measures.³⁰

Cabo Verde's National Adaptation Plan (NAP) for 2022–2030³¹ builds on these efforts by identifying priority actions such as institutional capacity building, research, planning, and adaptation actions. To track progress in building adaptive capacity, reference indicators have been proposed for the main expected changes in adaptation and resilience to 2030. However, detailed medium and long-term adaptation needs are yet to be identified as a basis for preparing and implementing relating strategies and measures, and the NAP has yet to be implemented effectively.

Although it is estimated that the country's broader climate mitigation and adaptation efforts will require significant resources, detailed investment pipeline and associated cost estimates are outstanding. The updated NDC estimates that the country's financing mitigation and adaptation ambitions will require US\$2.2 billion (EUR 2 billion) between 2020 and 2030, or US\$253 million per year, with half of the amount earmarked to support mitigation action and half to support adaptation action. Cost estimates at the activity level for mitigation and adaptation actions are not available in the NDC or the NAP, though the government is in the process of preparing a climate finance strategy and associated workplan. The workplan, it is expected, will provide more detailed information about the envisaged project and investment pipeline required to implement the commitments outlined in the NDC.

2.2. Cabo Verde's legal and institutional framework for climate action needs reinforcement³²

Although Cabo Verde has shown ambition through its NDC, the absence of dedicated, robust climate change legislation limits the enforceability and coherence of its climate actions. Cabo Verde lacks a comprehensive, dedicated national climate change framework law that would give the government the legal force needed to implement the NDC. Climate change legislation at the subnational level is also limited. Some municipalities have begun incorporating climate considerations into their local planning, particularly for disaster risk management and adaptation strategies. However, there is no formalized climate change law or cohesive framework at the subnational level, leading to fragmented efforts and unrealized ambitions.

Despite the absence of a comprehensive national climate change law, several other laws in Cabo Verde play a role in supporting the country's climate goals by addressing aspects of environmental protection, sustainable resource management, and emissions reduction. While not explicitly designed as climate legislation, they provide regulatory support for implementing climate-related objectives. They include the following nine:

- (i) an Environmental Law, which provides a broad framework for environmental protection and natural resource management in Cabo Verde and indirectly contributes to climate mitigation and adaptation by regulating activities that affect natural ecosystems;
- (ii) a Water Management Law, which governs the sustainable use, management and conservation of water resources critical for climate adaptation, and supports climate resilience by promoting efficient water use, safeguarding water quality, and promoting equitable distribution of water resources;
- (iii) an Electricity Sector Regulation, which sets the framework for the regulation of the electricity sector, promotes RE adoption, a central part of the country's climate mitigation strategy, and provides the legal basis for integrating RE sources, increasing energy efficiency, and reducing GHGs;

- (iv) a Decree Law for Pesticide Management in Agriculture, which regulates the use, distribution, and monitoring of pesticides in agricultural practices and indirectly supports efforts to build climate-resilient agricultural systems;
- (v) a Decree Law for Maritime Transport Regulation, which governs maritime transport activities; while the law does not explicitly address climate change, it sets a foundation for integrating climate-friendly practices, such as promoting energy-efficient and low-emission vessels;
- (vi) a Land Use Planning Law, which establishes the principles and regulations for land management, zoning, and land-use planning and provides a framework for managing land development in ways that protect ecosystems, reduce climate vulnerabilities, and promote climate-resilient infrastructure;
- (vii) a Forest and Wildlife Conservation Law, which governs the management and conservation of forest resources and wildlife and provides a legal basis for promoting activities that enhance Cabo Verde's climate resilience;
- (viii) National Strategy for Agriculture and Food Security, which, while not being a formal law, supports climate adaptation and helps to build resilience against climate-induced food insecurity by promoting sustainable agricultural practices and water-efficient irrigation methods; and
- (ix) a Decree Law for Coastal and Adjacent Marine Zoning, which supports the integration of climate resilience into coastal development, protecting ecosystems from climate-induced risks such as sea-level rise and extreme weather events.

Although these laws support environmental protection and the sustainable use of resources, they do not explicitly reflect the country's NDC commitments. They lack specific climate obligations for sectors and are overly reliant on nonbinding policy measures. Adaptation targets and disaster risk management processes are not clearly defined. Filling these gaps would substantially enhance Cabo Verde's climate resilience.

Limited coordination among government entities has hampered Cabo Verde's climate mitigation and adaptation efforts. The climate policy framework assigns coordination primarily to the Ministry of Agriculture and Environment, with the National Directorate for the Environment (DNA) and the National Planning Directorate (DNP) also playing important roles. The DNP, hosted by the Ministry of Finance, supports the integration of adaptation into national and local planning and budgeting processes. However, this policy-driven approach lacks a legally binding framework to clearly assign responsibilities and mandates, which limits the ministry's ability to enforce climate considerations across sectors. Strengthening the legal structure to formalize roles, grant legislative power to agencies, and establish coordination protocols would enhance climate governance. Additionally, incorporating a gender lens into climate budgeting—beyond current gender tagging practices—could lead to more effective and inclusive climate investments.

Recognizing these challenges and striving for a more efficient and effective climate response, the government has developed a new governance framework, but the associated operationalization is at an early stage. In May 2024, the government developed a new climate change law and established a comprehensive climate governance framework.³³ The framework identifies the Inter-ministerial Committee for Climate Action (CIAC)³⁴ which is led by the prime minister, the National Secretariate for Climate Action (SNAC), and the National Council for the Environment and Climate Action (CNAAC). The CIAC intends to act as a decision-making and coordination body on matters of climate policy and sectoral policies that impact national climate change objectives. The CNAAC³⁵ serves as an advisory body to the MAA on policy options and on cooperation between the public and private sectors. Its mandate is to coordinate, harmonize, and

monitor sectoral policies and develop proposals in the environment and climate change sector. The SNAC is an executive body that works directly under the Government member responsible for climate change, and further details will be set out in its own document.

Together, these serve as the main coordination and decision-making bodies and signify a whole-of-government approach to climate change intervention that aims to also facilitate close coordination across relevant government bodies.³⁶ The new governance framework is ambitious and multifaceted, addressing previously identified gaps, such as the need for clearer institutional coordination. However, the framework's effectiveness will depend on enacting binding legislation, achieving clarity on institutional roles and responsibilities, and creating robust enforcement and public accountability mechanisms. While the NDC sets a solid foundation, further work on legal instruments, institutional mandates, and subnational legislation will be crucial to ensure effective and comprehensive climate action.


Overall, Cabo Verde has a strong rule of law political culture, which provides a solid foundation for the enforcement of climate change laws, but the practical application faces challenges. The main challenges are driven by resource limitations, capacity gaps, and inconsistencies in enforcement. While the country has demonstrated a commitment to environmental and climate governance through policies and strategies, further strengthening of institutional capacity, legal mandates, and public engagement is needed to ensure that climate laws are not only in place but are also fairly and evenly applied in practice.


Finally, Cabo Verde's Environmental and Social Assessment (ESA) system provides a foundation for incorporating climate change risks and impacts in environmental impact assessments and strategic environmental assessments, but it has several challenges in addressing climate change priorities. Notably, there are few, if any, explicit Environmental and Social Impact Assessment (ESIA) guidelines for green and climate-resilient public investment projects, insufficient alignment with NDC commitments, and challenges in enforcement. Also lacking is a framework on greening the banking sector to promote green finance and to encourage all credit institutions to incorporate environmental and social risks into their credit decision-making processes. Enhancing the ESA framework to include climate-specific assessments and tools, together with requirements for incorporating environmental and social risk assessment into credit underwriting policies and operations, and strengthening enforcement would better align it with Cabo Verde's climate-resilience and sustainability goals.


2.3. The adaptation and resilience framework needs further strengthening

As part of this CCDR, the World Bank carried out an Adaptation and Resilience (A&R) Diagnostic for Cabo Verde. The diagnostic assesses a country's existing institutional framework, capacity for adaptation, and readiness for and progress on resilience. It also identifies gaps and facilitates wider policy and target setting. Using a whole-of-economy approach, the A&R assessment has been organized around six pillars: 1) laying the foundations for rapid, robust, and inclusive growth; 2) facilitating the adaptation of firms and people; 3) adapting land use and protecting critical public assets and services; 4) increasing people's capacity to cope with and recover from shocks; 5) anticipating and managing macroeconomic and fiscal risks; 6) establishing legal and institutional frameworks to ensure effective implementation and monitoring. Each of these pillars has been supported by a set of priority actions, and accompanying each action is a set of key indicators to evaluate progress toward implementing these actions.³⁷

According to specific scoring criteria, the assessment defines three levels of readiness and classifies the indicator as one of the following:

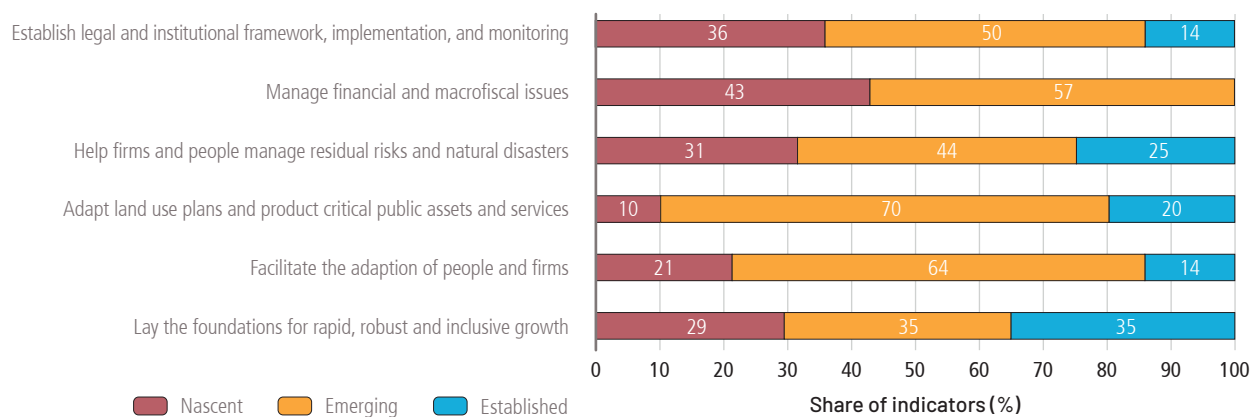
-  **Nascent (red)** if the country does not meet the standard or has areas that are only starting to emerge, or is ranked in the lower tier of a benchmark group

-  **Emerging (yellow)** if the country partially meets the standard and has progressed beyond the initiation point, or is ranked in the middle tier of a benchmark group

-  **Established (blue)** if the country meets the standard, or is ranked in the higher tier of a benchmark group

In line with the above analysis, the A&R assessment found that, despite substantial progress, Cabo Verde's climate change adaptation and resilience framework is still mostly emergent or nascent and needs strengthening. The A&R diagnostic categorized 55 percent of the indicators as emerging, 25 percent as nascent, and 20 percent as established (see figure 2.1), with a need to improve adaptive capacity and create an enabling environment to deliver on adaptation and resilience. The assessment recommends the following priority actions: (i) Better integrating climate resilience impacts and risks into long-term macroeconomic planning and budgeting processes, (ii) strengthening national adaptation strategies, institutional capacity, and monitoring in order to manage risks, (iii) working with the private sector to develop a cohesive climate and disaster risk management strategy with emergency plans and financial instruments, (iv) developing sector-specific adaptation targets and plans to promote resilience in climate-vulnerable sectors, and (v) addressing concerns about income inequality and unemployment rates to bolster the adaptive capacity of vulnerable populations.

Figure 2.1. A&R Diagnostic Outcomes



Source: Original compilation based on the Adaptation Principles framework from Stéphane Hallegatte, Jun Rentschler, and Julie Rozenberg, *Adaptation Principles—A Guide for Designing Strategies for Climate Change Adaptation and Resilience*. (Washington, DC: World Bank, 2024), <https://hdl.handle.net/10986/34780>.

2.4. Strengthening the measurement, reporting and verification system

The current national MRV system is limited but poised for significant advancements, with plans to strengthen its financing and training. There are efforts to mobilize funding to support the system, alongside initiatives to enhance and train human resources on MRV-related issues. Engaging all stakeholders in the national MRV system is crucial, and mechanisms are being developed for the efficient collection, processing, analysis, and archiving of data and documentation within the National System for Measurement, Reporting and Verification (SNMRV), along with IPCC (Intergovernmental Panel on Climate Change) guidelines and relevant software.

A coordinating body for the SNMRV is essential for strengthening sectoral capacity, as is the initiation of additional MRV projects focused on climate change adaptation and mitigation. To support these efforts, a center for archiving data and information on mitigation projects and a national greenhouse gas inventory is being planned. An effective communications system is also being designed to ensure the seamless transmission of data and information between sectors and the coordinating body. A memorandum of understanding with telecom operators aims to reduce transmission costs, and a comprehensive database is being set up to archive data collected from various sectors. A focal point person for MRV issues will be appointed to oversee these initiatives.

2.5. Preparing for carbon markets

Cabo Verde is increasingly interested in exploring carbon markets as a means to finance its climate mitigation and adaptation efforts. The NDC reflects Cabo Verde's commitment to reducing GHG emissions and promoting sustainable development. Although the country has made strides in policy development and has successfully mobilized some international climate finance, it currently lacks a comprehensive legal framework for carbon market participation.

At present, Cabo Verde has no formal carbon pricing mechanism, such as a carbon tax or cap-and-trade system, to incentivize emissions reductions. Furthermore, the legal framework does not outline procedures for approving projects that generate carbon credits, nor does it include accounting systems or registries to track emissions reductions and to credit transfers. As a result, Cabo Verde has limited capacity to engage in either Article 6 transactions under the Paris Agreement or in voluntary carbon markets.

To enable active participation in carbon markets, the country needs to strengthen its legal framework. This includes i) creating a national carbon market law, ii) implementing a carbon accounting and registry system, iii) preventing double-counting, iv) clarifying legal title and transferability, and ensuring transparency and environmental integrity.

2.6. Policy options to create a stronger enabling environment

Table 2.1. Policy recommendations to strengthen the enabling environment

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
High-level Objective 1: Build a robust, climate-resilient legal and institutional framework to achieve Cabo Verde's national climate goals						
Governance	Enact new climate change law and align local legislation with national climate objectives	Priority: High Timeline: Short term	Political economy: legal and administrative barriers	Parliament		Public budget (PB)
Governance	Further strengthen institutional capacity, legal mandates, and public engagement	Priority: Medium Timeline: Long term	Affordability: budgetary constraints Institutional capacity and readiness: need for training programs and capacity-building initiatives, and lack of effective collaboration and coordination	Ministry of Agriculture and Environment/ Ministry of Finance		PB
Governance	Mainstream specific climate obligations into sector laws and regulations	Priority: Medium Timeline: Long term	Institutional capacity and readiness: need for training programs and capacity-building initiatives	Various sector ministries		PB
Governance	Enhance the ESIA framework to include climate-specific assessments and strengthen enforcement	Priority: Medium Timeline: Medium term		Ministry of Agriculture and Environment		PB
Governance	Strengthen the legal framework for participation in carbon markets	Priority: Medium Timeline: Long term	Institutional capacity and readiness: need for training programs and capacity-building initiatives	Ministry of Finance		PB

Note: Barriers are classified as (1) affordability, (2) financing, (3) political economy, (4) institutional readiness, (5) structural, or (6) market.



3. Promoting the sustainable use of natural resources and building resilient infrastructure systems

3.1. Reducing climate change impacts with adaptation

Investments in adaptation to climate change can reduce climate change impacts and boost economic growth. To illustrate, the mechanization of agriculture from close to zero to 15 percent by 2050 could reduce modeled labor productivity losses from heat stress by 14 to 17 percent.³⁸ Similarly, increasing the country's irrigated agricultural land by 25 percent by converting 1,000 hectares of rainfed crops into irrigated land, and substituting heat-tolerant crop varieties for 50 percent of the most impacted crops by 2050, could, in the wet scenario, increase agricultural output by about 3 percentage points, or in the dry scenario, reduce the output losses from rainfed crops by about 3 percentage points.

Similarly, diversifying tourism away from “sun, sea, sand” would make the sector more climate-resilient, and would enable resorts to use natural resources more sustainably. Additional adaptation measures could include building all new infrastructure at higher elevations to reduce damage from sea level rise, or protecting the coast from sea level rise, or proactively upgrading roads to higher standards when they reach the end of their life. Strengthening the resilience of Cabo Verde will require policies and investments in the blue economy and at the water–agriculture–forestry and the urban–transport nexus that will reduce exposure and boost economic growth.

3.2. Enhancing integrated land and water management

Cabo Verde faces absolute water scarcity. Climate change is already manifesting in Cabo Verde in the form of increasingly prolonged cyclical droughts and extreme precipitation, and average annual rainfall is expected to drop by 5 percent between 2011 and 2040. Most of the country experiences either a hot desert climate or hot semi-arid climate (figure 3.1), classified under the Köppen climate classification, are coded as BWh and BSh, respectively (BW = arid, BS = semiarid, h = hot, k = cold). Cabo Verde's BWh regions are characterized by hot and dry summers, warm winters, and limited precipitation. Its BSh regions are characterized by hot summers and warm to cool winters with little precipitation. The terrain features weathered, fractured rocks that serve as goo reservoirs for groundwater storage. The problem is that the recharge is extremely low (although there is some variability across islands) (figures 3.2 and 3.3). For example, Praia has an average annual rainfall of just 200–300 mm per year.³⁹ (By comparison, the average annual rainfall in New York State is a little over 1,016 mm.) Soil loss caused by runoff from heavy rains, and organic matter loss, reduce the soil's retention capacity and limit infiltration for groundwater recharge, thereby drying up groundwater and surface water.⁴⁰



Figure 3.1. Koppen-Geiger Climate Classification Map, 1991–2020

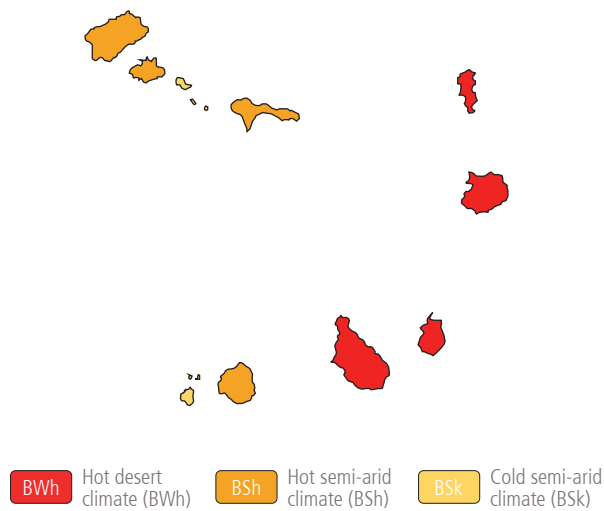


Figure 3.2. Monthly Mean Temperature and Precipitation, 1991–2022

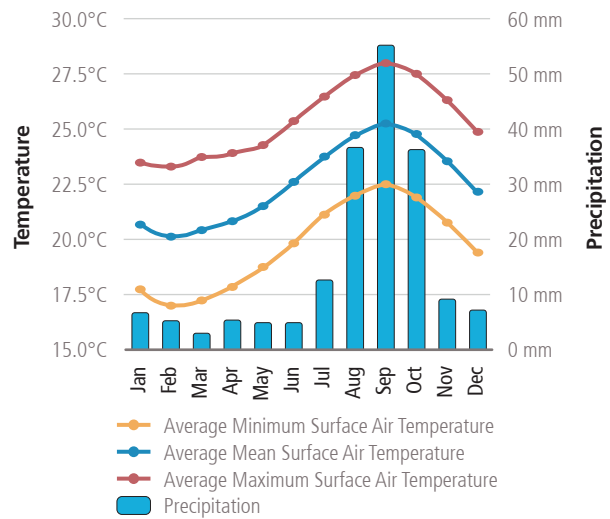
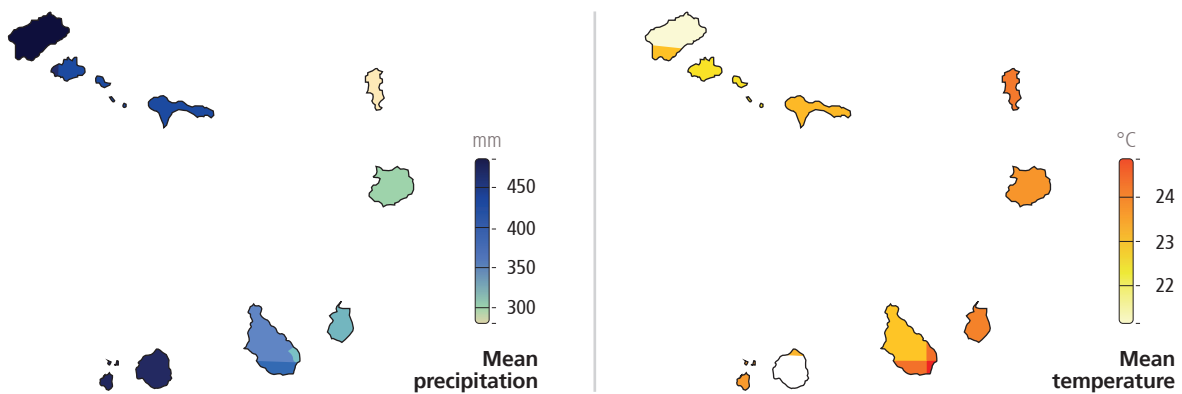


Figure 3.3. Mean Precipitation and Temperature by 1/4 Degree Grid Cell, 1995–2020



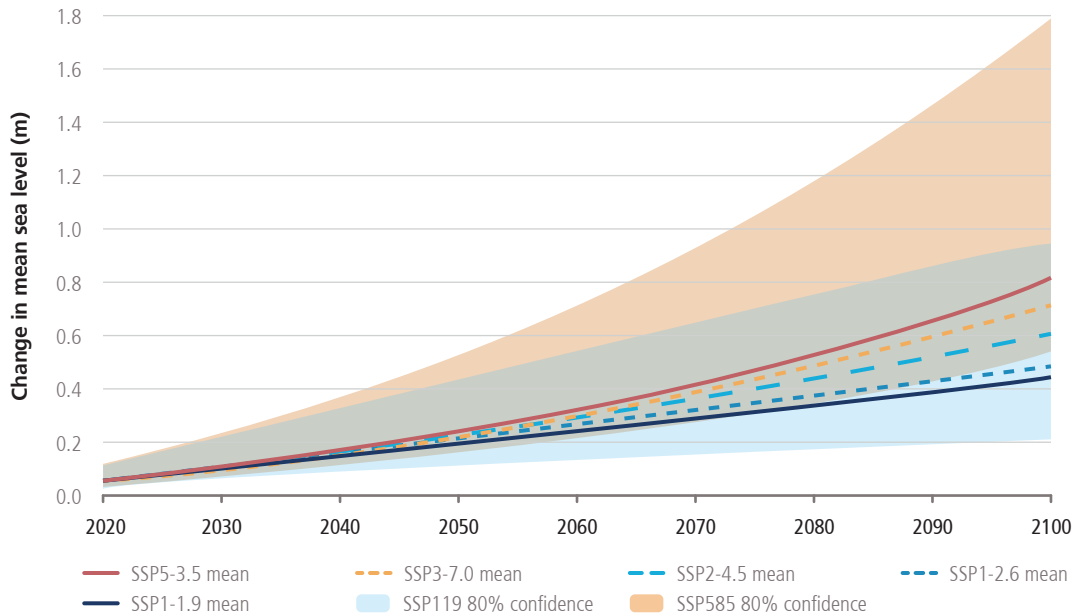
Source: World Bank, Climate Change Knowledge Portal, last accessed December 18, 2024.

Forests in Cabo Verde play an important role in preventing soil degradation and landslides, regulating the hydrological cycle, protecting the country’s rich biodiversity, and safeguarding the characteristic Cape Verdean landscape. Forests cover approximately 43,500 hectares, 11.5 percent of total land area.⁴¹ Santiago has the most extensive forest (and shrub) cover in the country—26,500 hectares, or 27 percent of the island’s area. Over the past decade, forest cover has remained relatively stable at around 11 percent, balancing losses resulting from urban expansion with gains from new plantation programs and spontaneous regeneration in abandoned fields and waterlines under more favorable conditions. Humid forests on mountain slopes that are more than 400 meters above sea level and are exposed to the northeast are particularly important because they receive humid air from trade winds, resulting in horizontal precipitation that significantly enhances soil humidity and water availability, recharging groundwater. Forests in arid areas are similarly important: they protect soil from wind and rain erosion, increase soil fertility through organic matter and nitrogen fixation, absorb CO₂ from the atmosphere, and provide fodder for livestock and fuelwood.

With rising sea levels, Cabo Verde is likely to experience a higher incidence of saltwater intrusion into its freshwater reserves. Sea level rise poses existential risks to the small island state (figure 3.4). The country’s low-lying islands—Sal, Boa Vista, and Maio—are disproportionately affected by coastal erosion and face an increased risk of coastal inundation.⁴² Extreme climatic events, such as storms accompanied

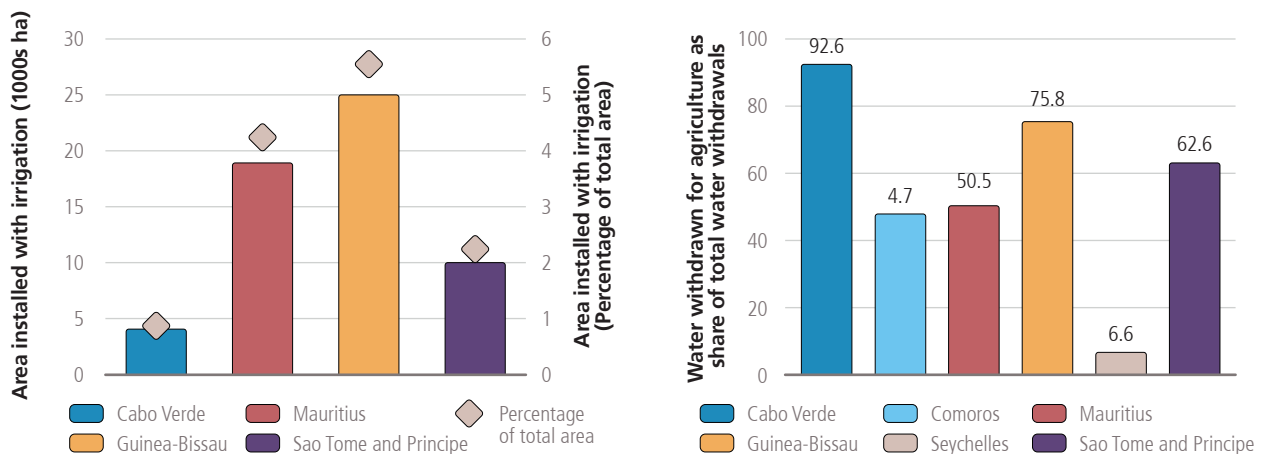
by violent winds, heavy rains, and tidal waves, aggravate the effects of sea level rise to permanently endanger assets and population. This trend also affects the availability of freshwater and arable land through salinization. A projected increase in sea level from 0.26 m to 0.98 m over the next 60–80 years will further worsen coastal submersion, erosion, flooded areas, and salinity.⁴³

Figure 3.4. Median sea level rise by 2100



Water withdrawals in Cabo Verdean agriculture are inefficient. Compared to its peers in the context of African SIDS and small states, Cabo Verde has one of the smallest areas installed with irrigation (about 4,000 ha), better than only Comoros and Seychelles. Yet it ranks highest among all SIDS for the percent share of water withdrawn for agriculture (figure 3.5). Cabo Verde’s agricultural water withdrawals as a share of total water withdrawals (93 percent of the total) indicates that agriculture far outweigh both industrial and municipal water usage.

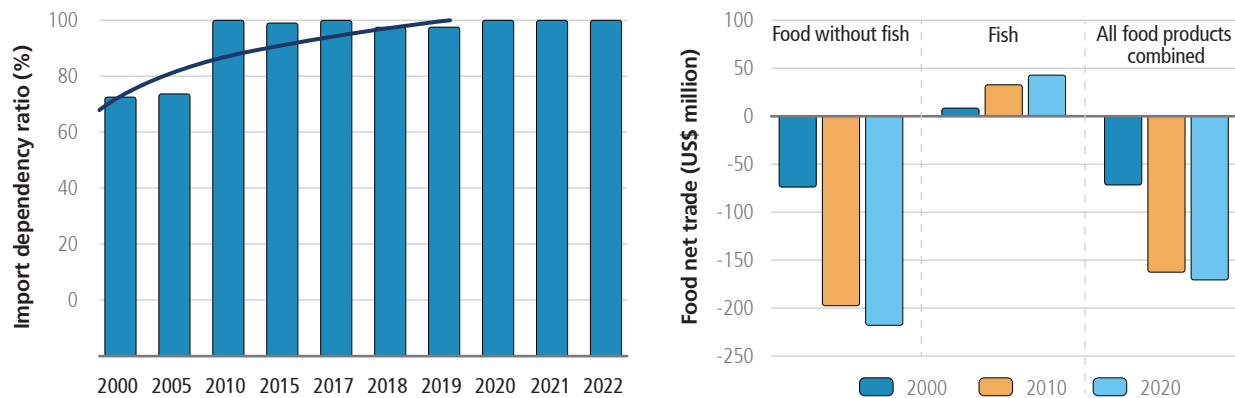
Figure 3.5. Cabo Verde has only a small area installed with irrigation (left graph), but a high share of water withdrawal by agriculture (right graph)



Source: Original compilation

Arable land is limited in size and at risk of degradation from soil loss and prolonged droughts. This limits agriculture productivity making the country highly dependent to food imports. Only about 10 percent of Cabo Verde’s land is arable; the agriculture and livestock sectors contribute less than 5 percent to GDP and employ 18 percent of the total population. The agriculture sector is characterized by low productivity because of its reliance on rainfed practices, which increase its vulnerability to rainfall variability and droughts. remains. During 2000–2022, Cabo Verde’s import dependency ratio, as a high net importer of food, remained consistently above 78 percent, with fish being the only commodity that showed positive trends for food net trade (figure 3.6).

Figure 3.6. Import dependency is high, including for food (left graph), with only fish showing a positive net trade balance (right graph)



Source: Food and Agriculture Organization of the United Nations (FAO), FAOSTAT Statistical Database (last accessed December 20, 2024), <https://www.fao.org/faostat/en>; Food and Agriculture Organization, *World Food and Agriculture—Statistical Yearbook 2023* (Rome: FAO, 2023) <https://doi.org/10.4060/cc8166en>.

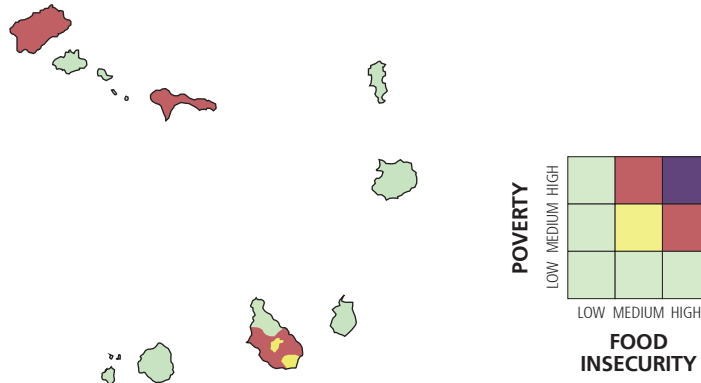
Additionally, around 143,000 people (28 percent of total population) live in hotspots of high poverty combined with high food insecurity. Acute food insecurity affects 37,000 people, or 7 percent of the population (Integrated Food Security Phase Classification, IPC).⁴⁴ In six municipalities, the share of population facing acute food insecurity is 15 percent or more, with five of those municipalities on the island of Santiago and one on the island of Santo Antão.

Combined with poverty headcount (using a \$3.65 a day poverty line) information (Geospatial Poverty Portal; World Bank), hotspots are defined as municipalities with high poverty and high food insecurity. Cabo Verde has two kinds of hotspots: First, nine of them (totaling 137,000 residents) are municipalities with either high poverty (20–30 percent) and medium food insecurity (5–10 percent) or medium poverty (10–20 percent) and high food insecurity (10–15 percent). A second type are municipalities with both high poverty (20–30 percent) and high food insecurity (10–15 percent). This is the municipality of Paul, home to 6,000 people. Municipalities with medium poverty and medium food insecurity, although not considered hotspots, are nonetheless considered at risk. Two municipalities—Praia and São Salvador do Mundo—fall in this category. As shown in figure 3.7, food insecurity remains unevenly spread across the islands but affects rural and already vulnerable populations the most.

Network losses and non-revenue water remain a major constraint on water security. Cabo Verde must desalinate seawater to ensure an adequate supply of drinking water. The water lost in water supply systems and desalination plants accounts for 30 percent of total water produced,⁴⁵ which is a large loss considering both the scarcity and production cost of water in the country. In Praia, water losses from sources such as high leakage rates caused by the age and condition of the distribution network amount to a very significant

38 percent⁴⁶ of the water produced. The country's 2018 Water and Sanitation Services Annual Report (RASAS) estimated water treatment losses at over 6.2 million cubic meters, much of which is thought to be brine from desalination processes.

Figure 3.7. Food insecurity remains unevenly spread across the islands but affects the rural poor the most



Source: Original compilation.

Note: The analysis uses poverty data at the island level (nine inhabited islands) from the Global Subnational Atlas of Poverty (GSAP) and the World Bank's Geospatial Poverty Portal. Municipality acute food insecurity data are from IPC Global Partners' Integrated Food Security Phase Classification. Each municipality is assigned the poverty level of its island. To identify hotspots, the country's 22 municipalities are categorized into nine groups based on a combination of three poverty categories (low, medium, high) and three acute food insecurity categories (low, medium, high). Based on the nine categories, the three groups of hotspots are (1) high poverty and acute food insecurity (dark red); (2) high poverty and medium food insecurity, or medium poverty and high food insecurity (red); (3) medium poverty and medium food insecurity. The poverty categories are based on the share of population living below the \$3.65 a day poverty line (2017 PPP) in 2019 (the lower-middle income country line), with low, medium, and high categories defined as either below 10 percent, or 10–20 percent, or 20–30 percent. The food insecurity categories are based on the share of population facing acute food insecurity (crisis, emergency, or famine), with low, medium, and high categories defined as below 5 percent, 5–10 percent, and 10–15 percent.

The lack of effective wastewater treatment threatens the environment. Wastewater treatment plants are available only in Santiago, Sal, São Vicente, and Boa Vista. Remote areas do not have access to sewage collection systems and rely on septic tanks or other solutions such as pit latrines. These systems, which often suffer from poor wastewater and drainage systems, often leak into groundwater and consequently threaten public health. Additionally, wastewater is generally not reused, missing an opportunity to increase water availability based on circular economy principles.

Against this background, the country has started to make investments in water storage infrastructure, irrigation systems, climate-smart agriculture, and desalination. Cabo Verde is tackling water scarcity through a combination of innovative and sustainable initiatives. The “Gota a Gota” project has successfully introduced drip irrigation, transforming some arid areas into productive farmland. Desalination plants, such as those in Praia and São Vicente, are providing fresh water, with renewable projects coming into the energy mix to power desalination, and to reduce the high costs of using fossil fuels to generate electricity.⁴⁷

Sustainable agriculture practices, supported by organizations like the UN and the Food and Agriculture Organization (FAO), include the use of drought-resistant crops and efficient irrigation methods. Additionally, water and sanitation reforms, backed by the Millennium Challenge Corporation, have spurred the creation of new utilities and infrastructure improvements, widening access to water and sanitation services. The country has also expanded its water storage capacity, with multiple storage facilities on different islands.

Cabo Verde needs to safeguard its water resources and possibly expand them through sustainable water and land practices, wastewater reuse, and desalinization. Cabo Verde should prioritize improving irrigation efficiency and using communication technologies for remote system management, including licensing systems for groundwater exploitation. These improvements could help optimize water usage and protect valuable resources. Nature-based solutions (NbS) such as soil cover for humidity, altitude moisture, rain vegetative harvesting, slope agroforestry, and improved infiltration can support the replenishment of water resources. Promoting low-carbon desalination and reducing water losses are essential steps to ensuring a sustainable water supply. Technological improvements and innovation, coupled with cheaper energy from renewable resources, could expand the use of desalinated and recycled wastewater for agricultural purposes. This would significantly expand production, including high-value horticulture for the tourism sector.

Integrating forest management with agriculture and tourism could create synergies that enhance climate resilience and inclusive development. Promoting agroforestry and sustainable land management improves soil health and productivity. Maintaining forest cover in areas with fog capture maximizes groundwater recharge, and extending cover in areas at risk of extreme events protects infrastructure and economic activities. Promoting sustainable forest management practices ensures that forest resources continue to support livelihoods, particularly in rural areas where dependency on forest products is high. The implementation of afforestation and reforestation community-led projects creates economic dynamics and work opportunities in economically depressed rural areas, positively impacting poverty reduction and economic resilience. Moreover, forests contribute significantly to the tourism sector by providing attractive landscapes and rich biodiversity, which are prime attractions for visitors, for example, in Sant Antao.

Cabo Verde should promote agriculture diversification to reduce import dependency and improve overall national food net trade. Diversification could be achieved through many channels, for example, the introduction of fruit trees and the expansion of horticulture. To diversify livelihoods that would otherwise be vulnerable to climate change impacts, efforts must be made to meet the need for facilitated rural access to high-yielding, drought-tolerant, and early-maturing seed, tree, and horticulture varieties.

Overall agriculture productivity ought to increase, and the judicious use of climate-smart practices needs to be promoted. The government should continue promoting climate-smart agriculture (CSA) practices that are suited to Cabo Verde's context. These include the use of drip irrigation, improved seeds/breeds, soil and water conservation techniques (for example, mulching with cover crops and crop residues, minimum tillage), intercropping of legumes and cereals, weed management (shallow weeding), good agricultural practices (GAPs) for improved crop management, improved harvesting techniques, post-harvest management, anti-erosion practices (for example, terraces, vegetative barriers involving *Cajanus cajan*, contour ridges, Zai pits, and so on), and the application of organic and inorganic fertilizers.

The use of pesticides, which has risen in recent years, should be done judiciously to avoid compromising environmental integrity. The use of Integrated Pest and Disease Management (IPM) practices adapted to reducing shock from climate change effects (for example, the targeted intercropping of cereals and legumes to reduce disease pressure) needs to be adopted by communities. The promotion of such practices could be done through school programs, farmer field schools, and agricultural demonstration plots at selected strategic locations, and should be done at times and places convenient for both male and female farmers.

3.3. Building a climate-resilient blue economy



A climate-resilient blue economy⁴⁸ involves strategies that aim to strengthen social, economic and ecological systems to better adapt to the impacts of climate change, including by leveraging the private sector.⁴⁹ In recent years, Cabo Verde has embraced the blue economy, an economic concept that merges sustainable economic growth with environmental protection to enhance climate resilience and secure the livelihood of coastal populations. In its national development agenda—the *Ambição 2030* (Ambition Plan 2030)⁵⁰—the country has committed to developing its ocean-based economy in a low-carbon manner by conserving and restoring natural habitats, including through nature-based solutions, while paving the way for more sustainable private investment. A sustainable blue economy approach is crucial because climate change and resource over-use compromise the natural resource base that many ocean-based sectors depend on, including fisheries and tourism. Without adequate action, overuse of ocean resources and climate change are set to derail blue economy development and induce negative socioeconomic outcomes for coastal populations.

Cabo Verde's blue natural capital has fueled the country's remarkable growth over the last few decades and represents an important foundation for future growth and climate resilience. Pristine beaches, diverse and productive fish stocks, charismatic megafauna, and an overall healthy marine environment have been the foundation of the growth in tourism and fisheries, and have helped drive GDP growth. Tourism contributes 25 percent to GDP and 45 percent to formal employment, in addition to attracting significant foreign direct investment (FDI).⁵¹ Largely because of tourism-related growth, GDP per capita almost quadrupled from 1989 to 2017.⁵² Fisheries, on the other hand, are critical for exports, nutrition, and traditional livelihoods. In 2021, fish products, both processed and unprocessed, accounted for 72 percent of exports, valued at US\$61 million. Fresh fish is Cabo Verde's second most important source of animal protein. The fishing industry, encompassing catching, processing, and trading, creates livelihoods for more than 6,000 fishers and engages more than 3500 women in fish trade and processing throughout the islands. Fisheries and fish processing are the leading non-service sectors of the economy, largely driven by tuna catches by foreign industrial vessels and the domestic semi-industrial fleet. Tourism and fisheries are the most critical contributors to Cabo Verde's blue economy and therefore discussed in greater detail in this CCDR, but other ocean-based sectors include maritime transport, desalination, and undersea cabling, while aquaculture and offshore wind represent opportunities for expansion.

The tourism sector's weak diversification and rapid growth, however, have increased Cabo Verde's vulnerability to climate shocks. The predominance of large all-inclusive resorts, which account for 80 percent of imported food, limits local supply chains and economic spillovers by discouraging spending outside resorts. In addition, the country's tourism is concentrated on only two islands, Sal Island and Boa Vista,⁵³ and limited to beach-and-sun tourism offerings. This carries exposure to external shocks and preference shifts in the tourism market. Although the industry's value proposition hinges on a healthy, attractive coastal and marine environment, rapid and poorly planned coastal development⁵⁴ at large scale has strained resources, and exacerbated climate vulnerability. A threefold increase in land dedicated to tourism has rapidly raised emissions and pollution, which has heavily affected water resources and negatively impacted local fauna.⁵⁵ Despite being a large tourism hub the highest per capita waste generation of all islands in Cabo Verde, Sal Island has limited waste management facilities, and waste generation is expected to more than double by 2035.⁵⁶

With an arid climate, Cabo Verde has insufficient groundwater to meet the growing demand from tourism and depends on desalination of seawater for its water supply (see also section 3.1 for a more detailed discussion of limited water resources).⁵⁷ Altogether, the sector generates significant emissions (around 7 percent), resource consumption (around 7 percent for energy use and 6 percent for water use), and waste. Additionally, when transport-related services are included, the tourism sector demands the most energy and emits the most GHGs.⁵⁸

Climate change impacts are likely to aggravate existing tourism vulnerabilities, leaving the population more exposed to shocks and job loss. The country's tourism offerings may become less attractive if tourists judge that certain periods of the year have become unacceptably hot. By century's end, it is projected that the number of days with a Temperature Humidity Index greater than 24 degrees Celsius (moderate to uncomfortable) will rise from the current level of zero days to as high as 50, especially under the most severe emissions models.⁵⁹ Significant changes in the assemblage of marine species could potentially result in the proliferation of nuisance species, such as jellyfish or sargassum/algae, that deter bathers and make beaches unwelcoming. For example, in the past, large amounts of sargassum on Caribbean beaches reduced local economic activity by 17.5 percent, with prolonged reputational affects.⁶⁰ Degradation of marine ecosystems and associated species may make tourism offerings less attractive; extreme weather events, particularly heatwaves, could disrupt operations and damage infrastructure, while rising sea levels will likely drive coastal erosion, flood marinas, and reduce the size and attractiveness of beaches while promoting overcrowding. Since much of Cabo Verde's economic activity is concentrated in these sectors, tourism losses could result in high job loss, reduced growth, and constricted government finances from lower incomes and higher coastal maintenance costs.

For the tourism sector, the 2024 Country Private Sector Diagnostic (CPSD) for Cabo Verde highlights the potential for mainstreaming the circular economy and other sustainable tourism industry practices as a significant opportunity for private sector mobilization for climate action. Tourists arriving in Cabo Verde are increasingly environmentally conscious and some are willing to pay a premium for green-certified offerings (accommodation, cuisine, and other experiences). On the business side, firms in the tourism sector are increasingly demonstrating commitment to sustainability, although most initiatives remain in the early stages with limited scale. Around 20 percent of tourism firms have adopted some sustainability and circular economy measures, typically motivated by their owners' commitment to sustainability and/or operational efficiencies.⁶¹ Separating plastics and glass is the most common initiative, but future interests include composting, community recycling schemes, and waste stream separation.

In terms of waste reduction, actions like using refillable toiletries and containers and alternative disposable silverware are the most common, with future interests in adopting refillable drink bottles, followed by the installation of large toiletry dispensers. However, these initiatives are currently fragmented and small in scope, with few operators having formalized their commitment by changing their business policies or

achieving some form of certification. Tapping into larger-scale adoption of circularity practices by the private sector, however, requires a range of enabling reforms and investments such as (1) providing the necessary infrastructure and regulatory framework for solid waste management; and (2) offering direct support and incentives for firms to invest in sustainability-linked practices.



Pathways toward more sustainable growth in the fisheries sector, particularly those that are private sector-led, as discussed in the CPSD, have been hindered by ineffective governance and management. Overexploitation of fish stocks, including through inadequate enforcement of catch limits, and limited research on fish stocks that supply local markets reduce the incomes of artisanal fishers and those who work along local value chains. Small margins and uncertain catch volumes make these microentrepreneurs among the most vulnerable to climate impact. Lower supply also results in higher prices and less food security for poorer citizens. Pelagic species, especially Atlantic yellowfin tuna, constitute a large portion of catches across all fleets, and serve as a major export, providing thousands of jobs. Although not considered overfished, the total allowable catch (TAC) in Cabo Verdean waters has been consistently exceeded in recent years (for example, 25 percent in 2019 and 42 percent in 2020).⁶² Excessive fishing and climate change may be reducing tuna availability in Cabo Verde's exclusive economic zone (EEZ), posing risks to export earnings and employment. Additionally, illegal, unreported, and unregulated (IUU) fishing incurs significant losses, contributing to annual economic losses of up to US\$2.3 billion in the Africa West region. Strengthening the government's capacity to monitor and effectively deter IUU fishing could enhance climate resilience and generate more revenue from legal agreements with foreign fleets, making this a central priority for Cabo Verde and its partners. To attract private investment, fishing fleet productivity needs to be enhanced and domestic value chains must be improved. Cabo Verde aims to establish itself internationally as a reputable source of socially responsible seafood, and the government has proposed policy recommendations that seek to clarify regulations, incentives, and the long-term value of marine resources. Ultimately, this would unlock the potential of capture fisheries while mitigating risks for aquaculture entrepreneurs.

Climate change may compound the challenges fisheries face if climate risks are not carefully managed and long-term sustainability is not ensured. Climate change poses significant risks to Cabo Verde’s fisheries, particularly pelagic and reef-associated species, which account for 80 percent of the country’s fish catch. Preliminary projections⁶³ indicate that habitat suitability and species richness could decline, especially in the southeastern portion of Cabo Verde’s EEZ. At the same time, moderate species extinction rates and high rates of alien species invasion are expected, particularly around coastal waters.

Despite these challenges, maximum catch potential (MCP)⁶⁴ for several major species may increase beyond, or remain around, current levels, especially under the worst-case scenario (SSP5-8.5),⁶⁵ providing opportunities for economic gains. By the end of the century, Cabo Verde’s maximum revenue potential (MRP)⁶⁶ is projected to increase, suggesting socioeconomic benefits, although the dependency on high-risk species demands urgent adaptive fisheries management to mitigate climate risks and ensure long-term sustainability.

The Government of Cabo Verde recognizes that sustained, private-sector-driven growth in these ocean-based sectors and the further development of a climate-resilient blue economy depend on the vigilant stewardship of the blue natural capital that supports them. In both the tourism and fisheries sector, safeguarding natural assets from further degradation and climate impact is critical and the government has embarked on strengthening the associated policy and regulatory landscape. Considerations for environmental and climate resilience are progressively being incorporated into tourism planning. Cabo Verde’s Island Master Plans 2020–2030 include an inventory of assets still to be effectively leveraged for economic growth and tourism development. The 2021 Strategic Tourism Marketing Plan focuses on the geographic and thematic diversification of tourism, and the Tourism Operational Plan 2022–2026 promotes resilience and inclusive, diversified tourism development through medium-term investments and reforms. At the same time, and in partnership with the University of British Columbia, the Government of Cabo Verde is currently carrying out an in-depth analysis on how climate change will affect the fisheries sector in the medium and long term and how the sector can best adapt to these projected impacts. The government has also embarked on assessing opportunities for incorporating solar structures into fisheries infrastructure and strengthening fisheries co-management for more sustainable fisheries management.

As the impacts of climate change become increasingly apparent, it is essential to further build on these efforts and fully integrate climate considerations into policy decisions to safeguard the natural asset base and prevent further degradation over the long term. Below are four ways to achieve this:

- 1) **Accounting for Cabo Verde’s natural assets, alongside production levels.** Integrating natural capital into fiscal oversight provides a fuller picture of wealth and climate resilience, aiding in strategic planning and attracting private investment into conservation and blue sectors. Projecting and analyzing climate change impacts on the tourism sector are critical to ensuring that existing data gaps are filled and that policy decisions can be comprehensively informed. In support of Cabo Verde’s commitment to ocean-based food security through regenerative fishing, a mix of interventions—including establishing no-fishing zones or marine-protected areas, and regulating fishing techniques—should be implemented to allow overfished stocks to recover and to prevent the overfishing of healthy stocks. There is insufficient empirical data on economically vital fish stocks, necessitating increased investment in targeted research to ensure sustainable fish populations in the future, and fishing capacity must be carefully managed to avoid excessive fishing efforts. Effective management should involve collaborative approaches, alongside efforts to organize and empower coastal communities and fisher groups to participate in decision-making, monitoring, and enforcement.

- 2) **Ensuring that investments consider a climate-affected future.** Cabo Verde's blue economy requires an integrated, long-term perspective. The government must ensure that private sector investments are climate-resilient, maintaining or retrofitting infrastructure to secure continued returns and economic contributions. Structural adaptations, like enhancing facility integrity and energy efficiency, must be paired with customer awareness campaigns and investments in marine conservation. This also applies to fisheries, aquaculture, and supporting public infrastructure. Proactive, nature-based policies, developed with the private sector, could reduce reliance on costly hard shoreline protection. Tourism expansion plans should be integrated into broader planning, while adaptation plans should remain flexible, allowing for the retreat of nearshore facilities in response to rising sea levels or erosion. In the mid to long term, as blue carbon markets evolve, Cabo Verde could leverage the ocean's natural carbon sequestration abilities. Protecting coastal ecosystems like seagrass beds, which store significant carbon, is crucial. Seaweed farming also has promise because sinking material to the seafloor contributes to carbon sequestration.

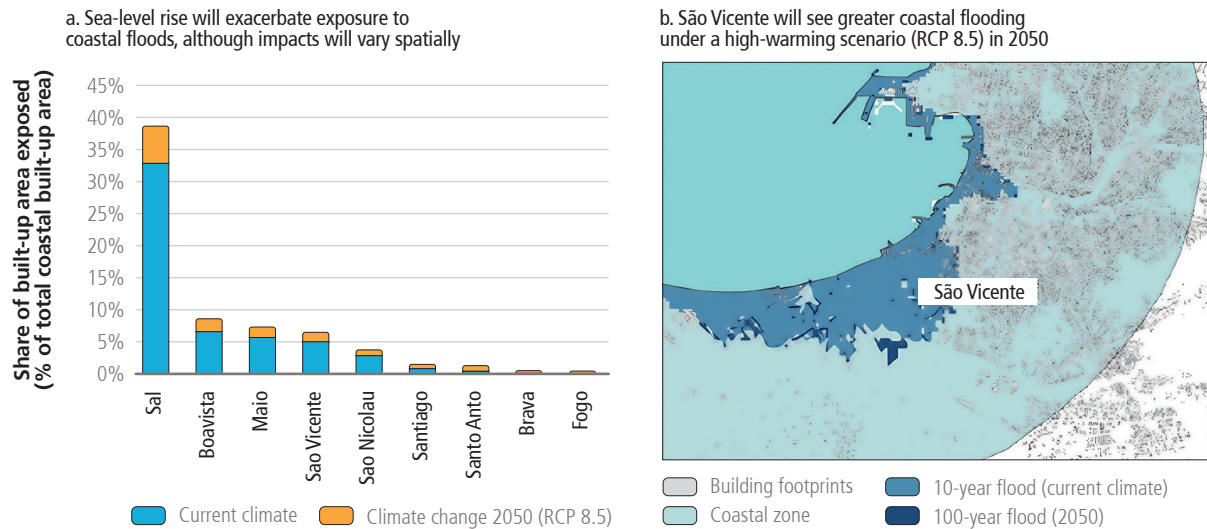
- 3) **Continuing to diversify to buffer against climate impacts and shocks and invest in sustainability.** Cabo Verde is committed to diversifying its tourism sector by developing new market segments and exploring sustainable practices. As outlined in several recently developed strategic plans,⁶⁷ Cabo Verde aims to attract diverse, climate-conscious visitors by prioritizing several strategic markets and products for development, beyond the beach-and-sun tourism offering. Besides hiking, yachting, and sport fishing, creative and cultural tourism, for example, has been identified as a growth market, as restated in the CPSD. However, to sustainably exploit these markets and successfully link them to existing ones, related analyses and development strategies still must be developed.⁶⁸ Sustainability considerations need to be emphasized across the tourism offering because travel decisions are increasingly based on sustainability aspects. This should include strengthening enabling infrastructure, public services, and goods by, for example, developing integrated waste collection and management systems to facilitate the strengthening of the local supply. Similarly, complementing fishing with aquaculture, including diverse production systems like seaweed and shellfish farming, could meet the growing demand for food and could build resilience if there is a conducive business environment. Cabo Verde's offshore areas hold significant promise for aquaculture and private sector investment: 1,637 square kilometers (km) of the country's territorial waters are suitable for aquaculture, while 45 square km are highly suitable.⁶⁹ Yet farming high-value marine species in or near the ocean requires significant upfront investments, made even more costly by unreliable transport, with delayed return on investment.

- 4) **Integrating planning and multisector coordination for the sustainable use of marine areas and conflict avoidance to create a foundation for the climate-resilient blue economy.** Cabo Verde's updated NDC and blue economy policies call for greater cross-sector coordination and planning. To support this, marine biodiversity must be inventoried and threats identified, potentially in collaboration with international research centers. Collaboration with regional and international science and technology institutions to support research needs in Cabo Verde should be intensified. With these data, national-level marine spatial planning (zoning) that incorporates climate adaptation strategies should be implemented. Concurrently, Municipal Master Plans should integrate shoreline and near-shore planning in a similarly coordinated manner. For the development of such plans, regional and local ownership will be essential to avoid conflicts and to ensure citizen buy-in of the blue economy.

3.4. Toward resilient and inclusive infrastructure systems—urban and transport

Cabo Verde is exposed to coastal flood risk, which is expected to worsen with the effects of climate change. Given the current climate conditions, 29 percent of Cabo Verdeans who live in coastal areas (equivalent to 19 percent of the national population) face exposure to a 10-year coastal surge event. Projections indicate that sea-level rise caused by climate change will lead to an increase in these figures (figure 3.8). Under a high-warming scenario, by 2050 the percentage of coastal inhabitants exposed to flooding could increase to nearly 32 percent, although discrepancies across islands would be broad, with low-lying islands suffering the most. Exposure to flooding is concentrated in the most populated and economically important islands: Santiago, São Vicente, São Nicolau, and Santo Antão. The capital, Praia, home to more than 170,000 inhabitants, is highly exposed to floods. About 24 percent of its critical infrastructure is at risk of flooding.⁷⁰ Currently, Sal is the most exposed island: 33 percent of its coastal urbanized area is susceptible to flooding, but this could rise to over 38 percent by 2050. Mindelo, the second-largest city, on São Vicente, is also at high risk of coastal floods. Without informed territorial planning that considers risk, urban and tourist zones may encroach further into hazard-prone regions.⁷¹

Figure 3.8. Coastal flooding risk is worsened by sea-level rise



Source: Original compilation based on Marconcini et al. (2022)⁷² and World Settlement Footprints (2019)⁷³

Source: World Bank, *Sailing Rough Seas: Accelerating Growth and Fostering Resilience to Climate Change in Cabo Verde*, Country Economic Memorandum (Washington, DC: World Bank, 2023), <https://documents1.worldbank.org/curated/en/099081423100593303/pdf/P1772680a5607608d0ab1608335945a51dd.pdf>.

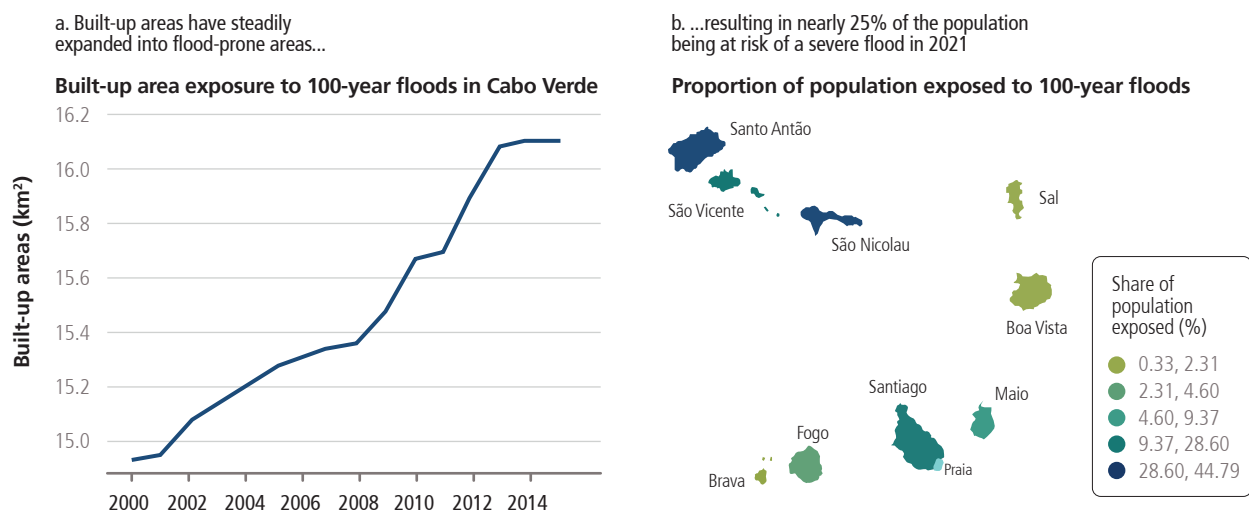
Cities are especially vulnerable to floods

With 67 percent of the population in urban areas,⁷⁴ Cabo Verde is one of Africa’s most urbanized countries. However, this urbanization has taken place without adequate spatial planning or sufficient access to basic infrastructure and services. Urbanization has been a constant trend in Cabo Verde since 1950, but it accelerated in the 1980s. By 1998, the share of the population living in urban areas had surpassed that of the rural areas.⁷⁵ Migration from the rural areas to the cities has been driven by droughts and the recent tourism boom, particularly on islands like Sal and Boa Vista. While there is notable variation in urbanization rates across municipalities, the urban population on almost every island currently exceeds its rural population. The exceptions are Brava and Fogo.⁷⁶ By 2030, the urban population growth rate is expected to be almost twice the national population growth rate (1.97 versus 1.15 percent per year) resulting in more than 74,000 new urban dwellers.⁷⁷

Urbanization trends have increased disaster risks as new settlements form within flood-prone areas. The 2018 revision of the Basic Law of Land Use Planning and Urban Planning integrated the use of disaster risk information in the production of the planning tools.⁷⁸ Prior to reforms to territorial planning laws, hazard and climate risk assessments were not systematically integrated, leading to population and infrastructure expansion into vulnerable regions. Currently, it is estimated that about a quarter of the population, or around 137,000 people, are exposed to severe floods,⁷⁹ emphasizing the need for a location-specific approach to building climate resilience (figure 3.9). Based on the highest-quality datasets available for Cabo Verde, it is estimated that, between 2000 and 2015, the built-up areas exposed to severe floods—those with a 100-year return period—increased by approximately 8 percent⁸⁰ (figure 3.9). Insufficient infrastructure and services in urban areas contribute to poor living conditions. For instance, in the capital Praia, a quarter of the population lives in informal settlements near unpaved streets and lack access to public spaces and infrastructure such as street lighting and drainage. This growth of informal settlements, particularly in flood-prone areas, increases exposure to climate hazards.



Figure 3.9. A large and increasing share of the population is exposed to floods, particularly in urban areas

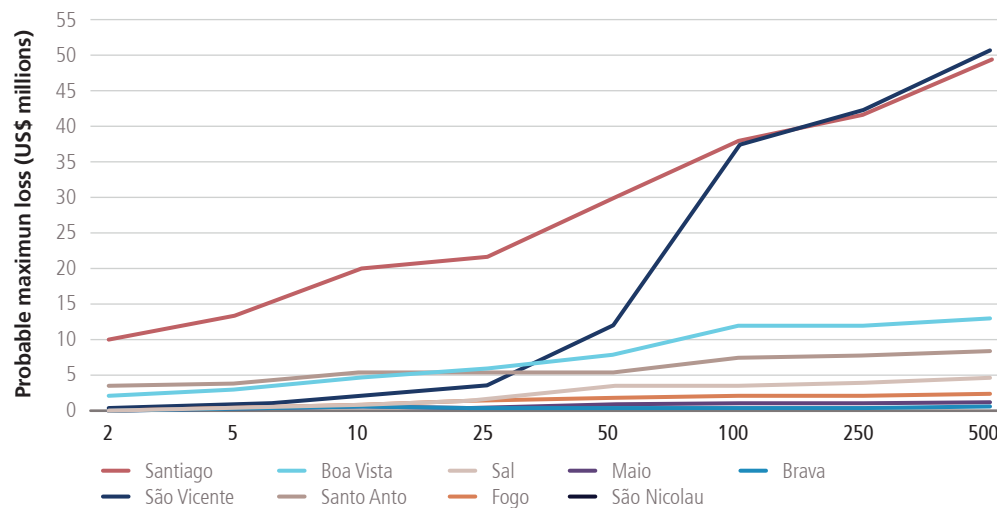


Source: Left: Original compilation based on Thomas Esch et al, “World Settlement Footprint 3D—A first three-dimensional survey of the global building stock,” *Remote Sensing of Environment* no. 270 (March 2022): 112877, <https://doi.org/10.1016/j.rse.2021.112877>; and on Mattia Marconcini et al, “Outlining where humans live: The World Settlement Footprint 2015,” *Scientific Data* 7, 242 (July 2020): 1–14, <https://doi.org/10.1038/s41597-020-00580-5>. Right: World Bank, Cabo Verde Country Economic Memorandum (Washington, DC: World Bank, 2021)

Note: Flood refers to fluvial and pluvial floods.

The most urbanized islands are particularly susceptible to damage and losses resulting from flood events. This report estimates that the annual average losses for Cabo Verde from various climate and disaster risks, including floods, earthquakes, volcanic eruptions, and droughts amount to nearly 1 percent of GDP, equivalent to US\$18.2 million.⁸¹ These losses are predominantly driven by flood-related events, which account for nearly 70 percent of the estimated average annual losses. The impacts are concentrated on Santiago and São Vicente, where the two largest cities and primary economic hubs of Praia and Mindelo are located. When considering extreme flood events exclusively, Santiago and São Vicente islands face an annual probability of 1 percent for losses that surpass US\$37 million each, equivalent to 1.88 percent of GDP (figure 3.9). This is noteworthy, given that these islands are the country’s economic centers.⁸²

Figure 3.10. Probable maximum losses due to floods vary for each island



Source: World Bank, *Disaster Risk Profile: Cabo Verde* (Washington, DC: World Bank, 2019), <http://documents.worldbank.org/curated/en/523961573390033686/Disaster-Risk-Profile-Cabo-Verde>.

Note: PMLs describe the losses that might be expected to occur with a given probability of occurrence or in a given return period, such as a 1-in-250-year loss.

Flood risk is also driven by the vulnerability of buildings, particularly in urban areas. Although building regulations exist, they currently offer limited design provisions to address disaster risk, and these are outlined in separate documents aimed at ensuring building safety. These provisions encompass only minimal considerations for structural design, fire safety, building services, and universal accessibility. Although legally adopted planning, permitting, and building control regulations are in place, enforcement capacity remains constrained. Technical requirements for green buildings are notably lacking.

According to the World Bank report *Building Regulations in Sub-Saharan Africa: A Status Review of the Building Regulatory Environment*,⁸³ the maturity level of Cabo Verde’s building regulatory framework is classified as Category C, with categories ranging from A to E.⁸⁴ Priority recommendations include updating building regulations with a focus on incorporating risk-informed design provisions and standards, while also developing complementary guidelines tailored to common types of small-scale and tourism-related constructions. Harmonization efforts are required to resolve any inconsistencies between existing building regulations and other pertinent laws.

Until recently, the government lacked a strategic approach to infrastructure planning, neglecting to systematically incorporate climate risk considerations. In 2024 for the first time, the government is currently developing a National Infrastructure Plan (PNI) covering 2024–2030.⁸⁵ The plan involves assessing existing

infrastructure gaps and prioritizing interventions in key sectors (physical works as well as soft regulatory, policy, plans, procedures), including transport, energy, ports, water and sanitation, health, and education. The PNI is adopting a multistakeholder participatory approach with sectors and municipalities. It aims to guide medium- and long-term infrastructure investments while addressing territorial inequalities, promoting local and national economic growth, and reducing climate risks and climate change impacts. To support the development of the PNI and data-driven decision making, infrastructure data are being collected to understand the condition of current assets, including vulnerability to climate hazards. The PNI also intends to identify financing mechanisms through direct foreign investment and public–private partnerships.

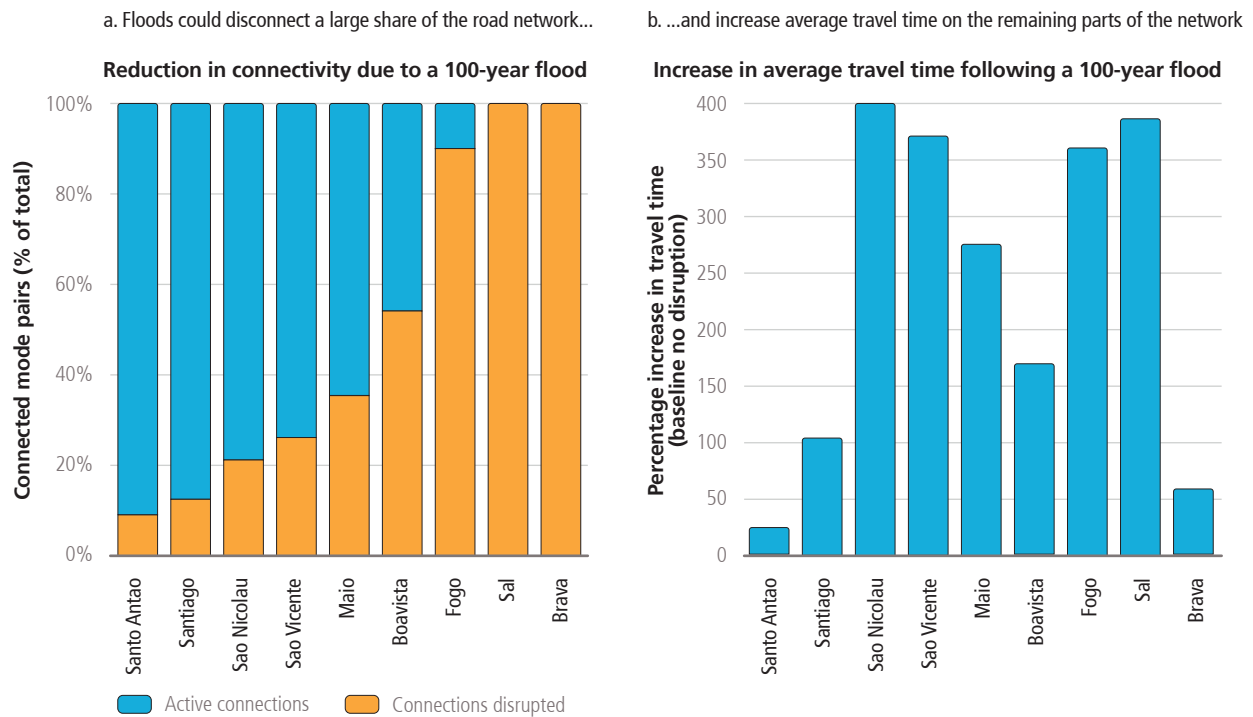
Transport is vulnerable to increased disruption



Reliable inter-island connectivity is not only critical for economic diversification and leveraging local links but is also a factor of climate resilience. Because of fragmented geography and long distances between production sites and consumers, Cabo Verde's economy necessitates efficient air and maritime transport infrastructure and logistics services. With the increase in the frequency and severity of weather events, well-managed operations and adequate maintenance of infrastructure would minimize service disruptions. Challenges persist in inter-island maritime and air connectivity, including unreliable service in certain lines and insufficient fleet and infrastructure. Efforts to address these challenges represent substantial opportunities for private investment, as illustrated by recent initiatives to run national airports and port terminals operations as concessions.

Climate change will exacerbate existing challenges and bring new development threats to the transport sector. Cabo Verde's geography makes air and maritime transportation infrastructure, along with logistics services, crucial for local economic development. Most of the supply originates from Santiago, Santo Antão, and Fogo (which account for 83 percent of the country's agricultural area), while the primary demand comes from São Vicente, Santiago, Sal, and Boa Vista.⁸⁶ The increased frequency of extreme rainfall, heavy winds, and changing maritime conditions could result in more cancellations of inter-island maritime services and increased damage to the vessel fleet. Such disruptions pose a significant threat to supply chains and transport networks, particularly impacting the agricultural value chain.⁸⁷ Additionally, sea-level rise could submerge critical transport infrastructure in coastal areas, disrupting sectors such as tourism, fisheries, and agriculture, while also hindering access to infrastructure such as hospitals and schools. This heightened vulnerability could undermine the government's strategy for economic development, which relies on linking the agriculture and tourism sectors, by causing more frequent disruptions to connectivity.

Figure 3.11. Floods could cause major disruptions to Cabo Verde's road network



Source: Original compilation, based on data from OpenStreetMaps and Fathom-Global. Global Flood Map. Fathom-Global, n.d. Web. 25 Dec. 2024. <https://www.fathom.global/product/global-flood-map>

Roads⁸⁸ and airports⁸⁹ will be greatly affected by severe floods on most of the islands, causing major economic losses. Of the nine inhabited islands, five would have more than 50 percent of their road networks affected by a severe flood event (that is, 100-year return period), according to World Bank analysis (figure 3.11).⁹⁰ In the heavily populated islands of Santiago and São Vicente, up to 90 percent and 70 percent of road network respectively could be disconnected in the event of a 100-year flood event, while in Santo Antão – one of the country’s agricultural centers—91 percent of the island’s road network, representing 93 percent of the travel demand of the island, could be disconnected by a severe flood event. Airports also face major disruptions from floods: the same analysis estimates that airports that concentrate more than 11 percent of the country’s flight passengers⁹¹ are in areas exposed to at least a 50-year return period flood. Consequently, the long-term sustainability of transport systems could be undermined by economic losses to the private sector, which recently started investing in and managing Cabo Verde’s transport infrastructure via PPPs, coupled with the fiscal pressures on the public sector to rebuild public transport infrastructure and manage its fiscal commitments and contingent liabilities.⁹²

Ports and coastal roads could be impacted by sea-level rise and coastal flooding. Roads on Sal face the highest exposure: it is projected that, by 2050, a 10-year coastal flood event (under a high-warming climate scenario) would affect up to 53 percent of the total travel network and 68 percent of travel demand. Similarly, roads on São Nicolau and Santo Antão are significantly exposed, with up to 35 percent and 24 percent of travel demand, respectively, at risk of disruption from a 10-year coastal flood event. These disruptions could also increase travel time on the remaining intact segments of the network. The figures analyzed considered only the effects of climate change on risk, without accounting for the likely effects of future urbanization or population growth. This suggests that the actual impacts could be even greater, which means that urgent adaptation measures are necessary to enhance the resilience of the country’s transport assets and minimize business and economic disruptions in the event of such climate shocks.⁹³

3.5. Policy options for a climate-resilient development path

Table 3.1 presents the key policy options identified by this CCDR to strengthen climate resilience in priority sectors.

Table 3.1. Policy recommendations for a resilient development path

Sector	Action	Priority/ Timeline	Main Barriers	Lead Actors	Indicators	Financing Sources
High-level Objective 3: Adopting integrated land and water management						
Water	Safeguard freshwater resources and invest in low-carbon desalination and wastewater reuse to increase availability	Priority: High Timeline: Long term	Affordability: budgetary constraints Financing: need to confirm business model with private sector Institutional readiness: limited coordination across sectors. Political economy: competing water demand across sectors	Ministry of Agriculture and the Environment Private sector	Increased availability of freshwater	Public budget/ concessional resources Private sector participation needed
Agriculture	Promote CSA practices, including drop irrigation, heat-tolerant varieties, intercropping, organic fertilizers, and so on	Priority: Medium Timeline: Medium term	Financing: need to confirm business model with private sector	Ministry of Agriculture and the Environment	Additional hectares under climate-smart practices	Public budget/ concessional resources Private sector participation needed
Agriculture	Promote diversification toward horticulture and fruits	Priority: Medium Timeline: Long term	Financing: need to confirm business model with private sector Structural: inefficient logistics and markets, limited connectivity across islands	Ministry of Agriculture and the Environment	Additional production of fruits and high-value horticulture	Public budget/ concessional resources Private sector participation needed
Agriculture	Support early-warning systems and agriculture insurance	Priority: Medium Timeline: Medium term	Affordability: budgetary constraints, limited ability to provide financial incentives to farmers, limited size of the market increasing costs	Ministry of Agriculture and the Environment	Forecasting capability, effectiveness, efficiency	Public budget/ concessional resources Private sector participation needed
Forestry	Integrate forest management with agriculture and tourism. Support community-led afforestation and reforestation	Priority: Medium Timeline: Long term	Affordability: budgetary constraints, limited ability to provide financial support to communities Institutional readiness: lack of coordination across different sectors Political economy: conflicting interests on land use	Ministry of Agriculture and the Environment Local Communities	Hectares of forest afforested or reforested	Public budget/ concessional resources Private sector participation possible Potential carbon finance resources
Water and Sanitation	Reduce losses in the water network and use digital technologies to achieve greater water efficiency	Priority: High Timeline: Medium term	Affordability: budgetary constraints Financing: need to confirm business model with private sector	National Agency for Water and Sanitation (ANAS)	Percentage of losses is reduced	Public budget/ concessional resources Private sector participation needed

Sector	Action	Priority/ Timeline	Main Barriers	Lead Actors	Indicators	Financing Sources
High-level Objective 4: Create a climate-resilient blue economy (tourism, fisheries, ocean)						
Fisheries	Research and monitor fish stock	Priority: High Timeline: Medium term	Affordability: budgetary constraints. Financing: need to confirm business model with private sector	Ministry of Sea Private Sector	Fish stock assessment completed	Public budget/ concessional resources Private sector participation possible
Fisheries	Establish fishing regulations, no-fish zones for regeneration, standards and certification for processed fish	Priority: Medium Timeline: Long term	Political economy: opposition from fish industry	Ministry of Sea	Fishing regulations enacted and enforced	Public budget/ concessional resources Potential Blue Carbon resources when available
Fisheries	Manage fishing capacity and enforce regulations	Priority: Medium Timeline: Medium term	Institutional readiness: limited access to data, capacity to monitor and enforcement	Ministry of Sea		Public budget/ concessional resources
Fisheries	Create a more conducive business environment for increasing aquaculture, including seaweed and shellfish	Priority: Medium Timeline: Long term	Affordability: budgetary constraints, limited ability to provide financial incentives. Structural: unreliable logistics and markets, limited connectivity across islands	Ministry of Sea Private Sector		Public budget/ concessional resources Private sector participation required
Fisheries	Strengthen coastal communities' climate resilience and launch awareness campaigns in marine conservation	Priority: Medium Timeline: Medium term	Political economy: opposition from fish industry	Ministry of Sea		Public budget/ concessional resources
Tourism	Support auto-adaptation of private sector along the shoreline	Priority: High Timeline: Long term	Affordability: budgetary constraints, limited ability to provide financial incentives.	Ministry of Tourism and Transport Private Sector	Investments from private sector in coastal protection	Public budget/ concessional resources Private sector participation required
Tourism	Diversify tourism offer away from beach and sun and to hiking, yachting, cultural and creative activities	Priority: High Timeline: Long term	Affordability: budgetary constraints, limited ability to provide financial incentives. Financing: need to confirm business model with private operators	Ministry of Tourism and Transport Private Sector	Increased offer beyond beach and sun	Public budget/ concessional resources Private sector participation required
Tourism	Protect coastal ecosystems and leverage blue carbon	Priority: Medium Timeline: Long term	Affordability: budgetary constraints Political economy: opposition from fish industry Institutional readiness: limited access to data, capacity for verification, monitoring, and enforcement; nascent blue carbon markets	Ministry of Tourism and Transport Private Sector	Surface of ecosystems protected	Public budget/ concessional resources Potential blue carbon resources when available

Sector	Action	Priority/ Timeline	Main Barriers	Lead Actors	Indicators	Financing Sources
Tourism	Reduce the footprint of the tourism sector on natural resources (water, waste, land, and so on)	Priority: High Timeline: Medium term	Affordability: budgetary constraints, limited ability to provide financial incentives. Political economy: opposition from tourism sector. Structural: lack infrastructure to support the transition.	Ministry of Tourism and Transport Private Sector	Footprint reduced	Public budget/ concessional resources Private sector participation required
High-level Objective 5: Build resilient and inclusive infrastructure systems						
Buildings	Update building regulations	Priority: High Timeline: Short term	Affordability: budgetary constraints, limited ability to provide financial incentives Political economy: opposition from construction industry and developers if no incentives	Ministry of infrastructure, Planning and Housing	New building regulations are enacted and enforced	Public budget
Instructure	Undertake risk-informed national infrastructure planning	Priority: High Timeline: Long term	Financing: assessment of current infrastructure needed	Ministry of infrastructure, Planning and Housing	National Infrastructure Plan is completed	Public budget
Roads/ Ports Airports	Implement risk-informed transport asset management	Priority: Medium Timeline: Medium term	Institutional readiness: limited access to data and technical capacity	Ministry of infrastructure, Planning and Housing		Public budget
Roads/ Ports Airports	Climate-proof the existing infrastructure	Priority: Medium Timeline: Long term	Affordability: budgetary constraints	Ministry of infrastructure, Planning and Housing	Kilometers of roads upgraded Number of ports upgraded	Public budget/ concessional resources
Roads	Ensure sustainable funding sources for road maintenance and rehabilitation	Priority: Medium Timeline: Medium term	Capacity to diversify and to adapt the sources of funding in an EV transition context.	Ministry of infrastructure, Planning and Housing		Public budget through ring-fenced taxes for road maintenance

Note: Barriers are classified as (1) affordability, (2) financing, (3) political economy, (4) institutional readiness, (5) structural, or (6) market.



4. Leveraging Opportunities from the Low-Carbon Transition

4.1. Leveraging sector transitions to avoid lock-ins and embrace innovation

In conjunction with enhancing climate resilience, Cabo Verde should design ambitious, far-reaching, and comprehensive policies to accelerate its transition toward low-carbon development. The country has made significant progress in achieving nearly universal electricity access and developing RE, but it remains dependent on imported fossil fuel for energy generation. Yet it has the potential to transform its energy mix to achieve net zero emissions from the power sector by 2050, most notably by investing in solar and wind technologies. In the transport sector, Cabo Verde can aim to replace most of its internal combustion engine (ICE) vehicles with EVs through a combination of infrastructure investments and calibrated policies. Combined with additional investments in waste management and digital infrastructure, such ambitious policies would enable Cabo Verde to leverage the transition in key sectors to avoid lock-ins and to take advantage of innovation.

Such proactive climate action would generate significant co-benefits for the Cape Verdean economy and population. New investments would add productive capacity that will potentially raise output while modernizing existing capital stock. Replacing fossil fuels with renewables in the energy mix, and replacing ICEs with EVs on the road, would greatly reduce fuel consumption, lower the import bill because of high fuel imports, and reduce external financing needs. Together with enhanced waste management, the transition in the energy and transport sector would also generate a significant decline in greenhouse gas emissions, reduce air pollution, and yield health benefits for Cabo Verdeans.

4.2. Accelerating the green energy transition

Cabo Verde has made significant progress toward achieving a 96 percent access rate to electricity, but its high dependency on imported fossil fuels for electricity generation (currently responsible for about 80 percent of generation) and high total losses of 24 percent impact the cost of electricity services. Although a revenue protection program has been envisaged for 2022–2024, insufficient investments in its implementation, security concerns that impede action in certain areas, and the high debt levels of water and sanitation SOEs and municipalities, have led to high nontechnical losses. Total system losses in Santiago exceed 30 percent. The average tariff in 2022 was US\$39.4 cents/kWh, whereas the cost was US\$44.1 cents. Historically, tariffs have not been cost-reflective, although the gap has been relatively modest: about 5-10 percent from 2017 to 2020. In 2021 and 2022, costs increased significantly because of the volatility of international oil prices, widening the gap to 18 percent in 2021 and back to 11 percent in 2022. As of April 2024, the average tariff has declined to US\$34.14 cents/kWh, reflecting more stable oil prices since June 2023, at about US\$80/barrel.

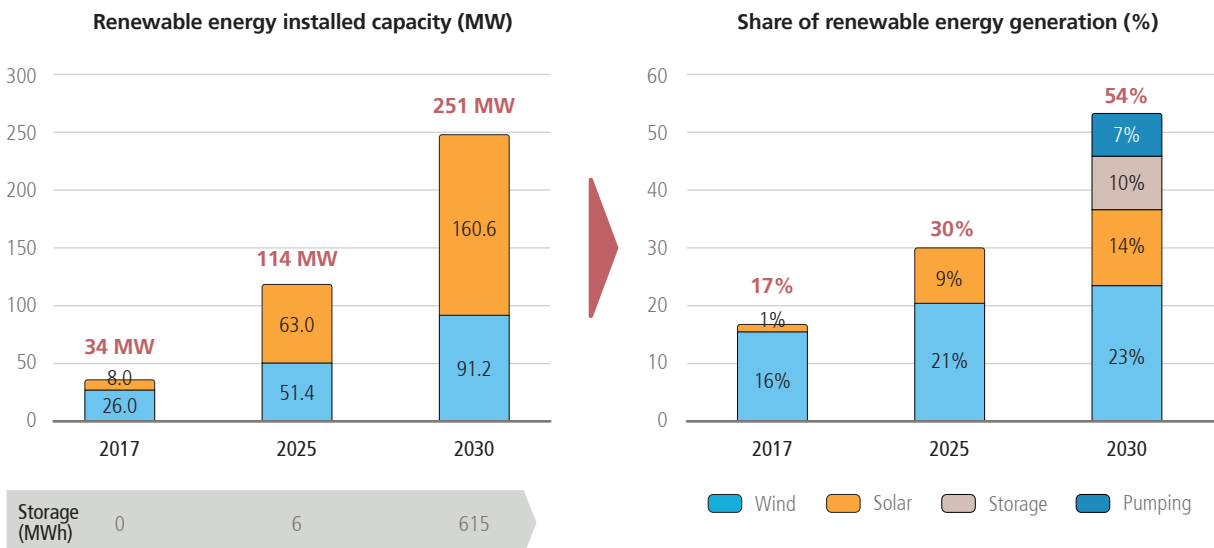
Although highly dependent on imported fossil fuels for energy production, the country has substantial potential solar (> 3 GW) and wind (> 500 MW) resources that would allow for the development of renewable energy. Grid-scale RE and distributed generation, along with a financially viable energy sector, could bring affordable, reliable and cleaner electricity to households, unleash entrepreneurial opportunities in sectors such as tourism, enable economic diversification, and reduce the fiscal burden from the energy sector.

The energy sector is therefore expected to significantly contribute to Cabo Verde's mitigation commitments in its updated NDC. Historically, the energy sector has contributed the lion's share of the country's GHG emissions (more than 80 percent in 2020). These emissions are expected to rise in line with the growing demand for energy under a business-as-usual scenario (that is, the same energy mix as in 2019). Energy demand is estimated to reach approximately 363,836 tons of oil equivalent (toe) by 2030, up from 222,928 toe in 2019. Two mitigation contribution areas have been identified in the updated NDC: (1) reducing energy intensity and promoting energy efficiency; and (2) increasing RE targets (that is, 54 percent RE by 2030).⁹⁴

A National Program for Sustainable Energy (PNSE) was launched within the framework of the country's Strategic Plan for Sustainable Development (PEDS 2017–2021). The PNSE aims to accomplish the transition to a secure, efficient, and sustainable energy sector, reducing dependence on fossil fuels, targeting universal access by 203, and prioritizing energy security. The NPES focuses on five areas: (1) institutional strengthening and improvement in business environment; (2) energy market reform; (3) investment in strategic infrastructure; (4) RE development; and (5) promotion of energy efficiency.

The PNSE is underpinned by the Electricity Sector Master Plan (2018–2040), which sets the objective of achieving 54 percent of power generation from variable renewable energy (VRE) sources by 2030, including 251 megawatts (MW) of RE generation, and 615 megawatt-hours (MWh) of storage. The current installed capacity is 177.2 MW, of which 36 MW comes from renewables. Several VRE independent power producers (IPPs) are already operating in the country, including Cabeolica, with a 25.5 MW wind farm. An additional 45 MW of renewable energy (solar and wind) and 55 MW of storage is currently under development. The Santiago pumped-storage plant (20 MW) project, financed with support from the European Investment Bank (EIB) and the European Union, is expected to have a transformational impact on increasing VRE integration in Santiago. Moreover, 9 MW of distributed generation and more than 16 MW for self-production and desalination have been developed.

Figure 4.1. Renewable energy targets according to the Electricity Mast Plan 2018–2040



Source: Government of Cabo Verde, "Plano Diretor do Setor Elétrico 2018–2040," *Boletim Oficial da República de Cabo Verde* | Série, no. 40 (2019), <https://faolex.fao.org/docs/pdf/cvi185115.pdf>.

The Electricity Law Decree No. 54/99, and its updated version of 2006, establish the basic framework for Cabo Verde's electricity sector. Based on a concession and license system, the law aims to maintain a system for sustaining adequate power supply, deliver supply at reasonable tariffs, and contribute to economic development based on normal market competition with private sector participation. Following Electricity Law Decree No. 54/99, the regulatory foundations for IPPs have been established with the enforcement of Law Decree No. 30/2006 (IPP license regulations), Law Decree No. 18/2006 (IPP license performance guarantee), and Law Decree No. 21/2006 (IPP license tariffs). In 2011, the Renewable Energy Law Decree (Law Decree No. 1/2011 and its latest updated version of 2018) was issued with the aim of promoting RE. Legislation on self-production and net metering was enacted in 2011 and 2014 to further advance the development of RE, including “behind-the-meter” installations.

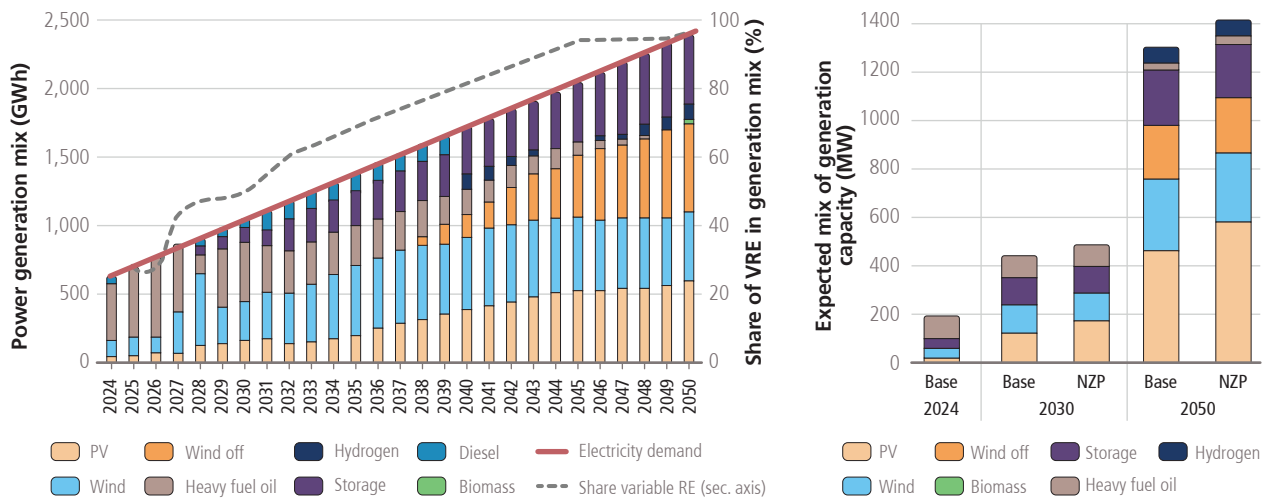
The GoCV estimates that about US\$557 million is required for the implementation of the 2019–2030 investment pipeline, encompassing VRE integration, grid reinforcement and modernization, a risk mitigation facility, distributed generation, and e-mobility. The GoCV plans that most of the new VRE capacity is to be financed by private sector IPPs. However, many challenges stand in the way of the development of RE at scale. The main ones include high off-taker risk, especially after the global energy crisis caused by Russia's invasion of Ukraine, which affected the financial situation of the national utility Electra as off-taker for IPPs; the limited scale of power generation facilities because of the small size of, and low connectivity between, Cabo Verde's islands; the investment required for grid extensions, reinforcement, and storage capacity to integrate the power generated from VRE into the main system; institutional barriers to scaling up distributed generation; and the limited capacity of the GoCV to procure new renewable energy IPPs. Investments in grid modernization and reinforcement, storage and ancillary services, derisking investments, and the aggregation of smaller projects to attract private sector participation will therefore be critical for the energy transition.

The GoCV is pursuing efforts to implement sectoral reforms to restructure the electricity utilities ELECTRA and AEB/Águas e Energia de Boavista, which will also help pave the way for more private investment in the sector. The restructuring process aims to (1) improve transparency in the sector; (2) support the energy transition; (3) reduce the cost of service by decreasing the cost of electricity generation and nontechnical losses; (4) leverage private capital and expertise; and (5) improve service quality. The reform has been supported by the World Bank through the State-Owned Enterprise (SOE) Related Fiscal Management Project (P160796), the Second Resilient and Equitable Recovery DPF with a Cat DDO (P176148), and advisory support under the Renewable Energy and Improved Utility Performance Project (REIUP, P170236). The restructuring process has led to the creation of new institutions in the electricity sector—in particular, EPEC (thermal generation), ONSEC (single buyer, transmission networks operator and power dispatch), and EDEC (distribution and retail). As per Decree-law No. 34/2022, which sets the procedures for the operationalization of the approved reform, up to 75 percent of the shares of the companies responsible for distribution and thermal generation will be transferred to the private sector. The transmission network operator will remain an SOE.

Recommendations

The share of VRE in Cabo Verde's electricity generation mix is expected to increase to more than 50 percent by 2030, and to 100 percent by 2050 (figure 4.2a). At the same time, solar (PV) and onshore wind capacities are expected to increase from 10 MW and 25.5 MW in 2024 to around 350 MW each in 2040, respectively, in a net zero power emissions (NZP) scenario (figure 4.2b).

Figure 4.2. A net zero power emissions scenario would entail significant increases in renewable energy



Source: Original compilation

The following measures are recommended for increasing the share of (V)RE in the energy mix to meet the 54 percent VRE target by 2030 while rapidly increasing the deployment of (variable) renewable capacity:

- 1) Improve planning capacity through a systematic review of the Least-Cost Electricity Master Plan.
- 2) Boost public investments for grid reinforcement, upgrades, and modernization, including deployment of SCADA/EMS/DMS on all islands.
- 3) Implement a large deployment of storage through both pumped storage hydro (around 20 MW in Santiago) and battery energy systems (about 100 MW needed by 2030 in the NZP scenario; mostly co-located with VRE plants) to provide the reliable capacity that is both firm and flexible, along with network stability.
- 4) Create enabling conditions for mobilizing private capital. These include improving the financial viability of the sector and achieving greater transparency through reforms; strengthening the competitive procurement framework; creating a risk mitigation facility to address off-taker risk; offering transaction advisory support to integrate small projects into larger, more attractive bidding packages for prospective investors; and making other derisking investments such as wind measurements.
- 5) In the long term, interconnecting the islands more closely and efficiently would further facilitate VRE deployment at scale and a more efficient utilization of storage and RE.

Greater VRE integration would allow for the gradual decommissioning of thermal plants and reduce dependency on imported fossil fuels, with a positive fiscal impact. Future power purchase agreements with thermal IPPs will need to include provisions for decreasing thermal generation over time and responsibilities for decommissioning, while providing dependability, flexibility, and firmness to the power system.

Improved sector governance, transparency, financial performance and operational efficiency; the implementation of the revenue protection program; and the reduction of technical and nontechnical losses are all required for the adequate use of energy resources and improved revenue for the sector. Specific investments and actions are also recommended for the implementation of the grid modernization

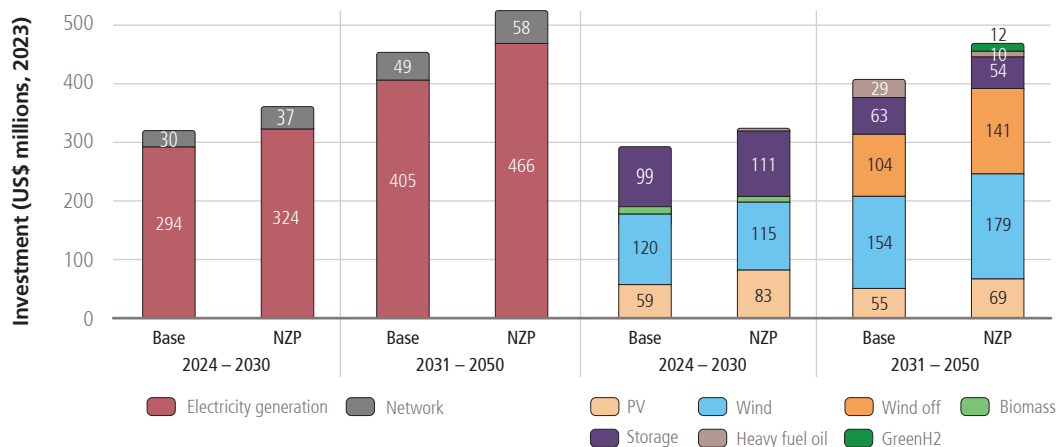
and digitalization plans, which include institutional developments, improved processes, adoption of smart meters, public awareness campaigns and targeted actions to increase the collection rate of the utility. Institutional building for the newly created ONSEC (National Operator of the Cabo Verde Electricity System), the Ministry of Commerce, Industry, Commerce and Energy's planning and coordination role, and the regulatory functions of ARME (*Agência de Regulação Multisectorial da Economia*) are critical in the energy transition process. Climate resilience measures should be incorporated into the planning and implementation of an investment plan.

Five other considerations will be discussed here:

- 1) **Distributed generation and energy efficiency play a key role** in the efficient use of resources by public facilities, including health, education and public administration, and in sectors that drive economic growth, such as tourism and the blue economy. Overcoming institutional challenges to implementing the regulatory framework—including through adequate financing, an enabling tax regime, sustainable business models, local technical expertise development, and incentives for SMEs, energy service companies (ESCOs), and domestic users—would promote the deployment of clean and efficient technologies at scale. For public facilities, ensuring long-term funding for operating and maintaining rooftop solar is critical for the sustainability of public investments. The Center for Renewable Energy and Industrial Maintenance (CERMI) has been training technicians in distributed generation and energy efficiency. The training programs will need to be scaled up to create a large pool of technicians, auditors and certified evaluators to enable the implementation of the adopted legislation. Coordinated development with skills missions and STEM-led education can help both Cabo Verdean women and men gain from emerging green job opportunities in the RE sector.
- 2) **Electric mobility:** The GoCV has ambitious e-mobility targets: (1) achieving 100 percent e-mobility by 2050; (2) replacing the public fleet of ICE vehicles with EVs by 2030; and (3) deploying the necessary public charging infrastructure network by 2030. Achieving these targets will require careful consideration of the additional electricity demand from e-mobility in the overall energy demand growth estimation of the updated least-cost master plan. It will also require an analysis of grid infrastructure impacts, especially during peak charging periods, and the infrastructure investments needed to deploy and scale up e-mobility solutions—investments such as grid reinforcements, battery storage, and increased use of RE-based charging infrastructure. EV numbers are expected to grow rapidly, from less than 200 today to about 210,000 by 2050, corresponding to an additional energy demand of about 1 terawatt-hours by 2050. Accelerating and mainstreaming e-mobility will require financial incentives, sustainable business models, and policy and regulatory framework development, including time-of-use tariffs to steer charging toward periods with high RE availability.
- 3) **Supporting innovation, including green hydrogen development, will be important for developing RE at scale.** Technical studies to identify green hydrogen use opportunities (such as storage, ferries, and other vessels) and competing options and challenges, such as technology risks, technoeconomic analyses, regulatory requirements, and capacity building, will need to underpin the development of a green hydrogen roadmap. Financial incentives are required to pilot the technology in the country. Leveraging the analysis done for other SIDS and international knowledge exchange can contribute to the decision-making process on the topic. Beyond 2040, gas turbines running on green hydrogen—about 60 MW is forecast by 2050 in the NZP scenario—could contribute to the necessary flexibility and firmness of the power system, if the expected cost decreases in green hydrogen stay on target.
- 4) **The energy transition should adopt a human-centric approach.** People should be at the center of sector reform, privatization processes, the decommissioning of thermal plants, and skills development for the energy transition. A partnership between the government, the local education system, and

professional training centers would ensure the development of the necessary knowledge and skills required for the effective operation of newly created sector institutions, and the maximization of the socioeconomic benefits of the energy transition. Mainstreaming gender within skills development programs aligns with both national and energy sector gender strategies and can help contribute to job creation targets, particularly for women.

Figure 4.3. Comparison of investment needs for the business-as-usual (base) scenario versus NZP emissions by end date scenario



Source: Original composition

- 5) **The development of a comprehensive investment plan would facilitate leveraging public/climate and private funding.** The government has estimated that of the US\$557 million needed for investments during 2019–2030, the private sector could contribute as much as US\$300 million to investments in renewable energy, storage, energy efficiency, and technology innovations. Improving the financial viability of the energy sector, and access to finance and derisking instruments, with financial and advisory support from the World Bank, IFC and MIGA, would facilitate private capital mobilization. Partnerships with potential development partners such as the African Development Bank, the EU, the EIB, LuxDev, and GiZ are critical for supporting the projected evolution of the energy mix. The operationalization of the Climate and Environmental Fund (potentially about a EUR 150 million Portuguese debt swap), the Sovereign Fund for Sustainable Investments (EUR 100 million) and other public resources (loans and grants) with a focus on energy transition would accelerate the decarbonization of the energy mix. In addition to the government’s investment estimates, World Bank analysis shows that US\$516 million (in discounted terms) will be required over 2031–2050 to meet net zero power emissions by 2050 while also meeting the increased demand from massive EV deployment.

4.3. Transport

Cabo Verde has made significant strides in supporting electromobility as part of its National Program for Energy Sustainability (PNSE). With the goal of reducing dependence on fossil fuels and promoting a sustainable energy sector, the government has developed a comprehensive strategy for transitioning to EVs. This includes the approval of the Electric Mobility Policy Charter (CPME), which sets out a vision for the gradual replacement of internal combustion vehicles with zero-emission EVs by 2050. The CPME outlines three main objectives: (i) complete replacement of all ICE vehicles with EVs by 2050; (ii) national charging infrastructure installed by 2030; (iii) 100 percent EV fleet in public administration sector by

2030. The short-term measures include developing legislation, establishing charging infrastructure, and offering incentives such as exemptions from VAT, import duties, and special consumption taxes for EVs and related equipment.

The medium-term measures include having at least 50 percent of EVs in new acquisitions for urban public transport; modernizing the electrical system and adopting smart technologies to ensure the proper functioning of grids with high penetration of intermittent renewable energies; addressing the holistic integration of the charging system for EVs; and promoting and encouraging R&D pilot projects applied to the vehicle-to-grid (V2G) system in Cabo Verde, leveraging national research and innovation capabilities.



The GoCV launched the Promotion of Electric Mobility in Cabo Verde Project (ProMEC) in March 2021,⁹⁵ with the aim of promoting EVs to achieve a significant share in the national vehicle fleet. ProMEC includes an incentive component to support the acquisition of up to 600 EVs and 100 private charging stations (Wallbox type) for eligible applicants between 2022 and 2025. In addition, Resolution No. 14/2022 of February 16, 2024 establishes an incentive program for the acquisition of EVs and private charging stations. It outlines the general guidelines and directives to be followed for implementing the program, covering different categories of EVs and private charging stations. As of July 2024, the program has approved 179 EV projects, reaching US\$1.15 million in financing.

The government has not yet outlined a strategy for electrifying other transport services, such as ground handling services at airports, port logistics, and passenger services. Currently, ProMEC supports only four-wheeled vehicles such as private cars, commercial vehicles, minibuses, and buses. There is therefore potential for decarbonization through electrification in other transport modes. In the aviation sector, IFC announced a sustainability-linked financing package of EUR 20 million for Cabo Verde Airport SA to meet the investment requirements of reducing GHG emissions.⁹⁶ This presents an opportunity to also encourage the electrification of aircraft handling services. In the maritime sector, there is an opportunity to incentivize the retrofitting and purchase of electric and solar or hybrid small boats, mainly those used by fishers and/or leisure tours. For inter-island transport, by contrast, the installation of solar panels in boats is more feasible. That will only be possible if ports and docks provide the necessary infrastructure for charging electric boats. To that end, for example, the modern cruise terminal of Mindelo will be equipped with onshore power supply technology, which will enable the decarbonization of Porto Grande Bay, where Mindelo lies.

4.4. Waste Management

Cabo Verde's waste management system is currently facing significant challenges, particularly inconsistent irregular collection, low processing capacity, and inadequate financing. According to the islands' Operations Waste Management Plans (OWMPs), the country generates an average of 0.61 kg of municipal solid waste per capita per day, expected to rise to 0.84 kg/capita/day by 2035. This increase, it is expected, will be most pronounced in Sal (reaching 1.8 kg/capita/day), Santiago, and São Vicente. Several islands, including Sal, Fogo, São Nicolau, and Santiago, are already struggling with insufficient temporary waste storage capacity, exacerbating the problem and causing air and water pollution. The composition of waste is dominated by organic materials, with tourism-heavy islands generating a higher proportion of food waste, highlighting the impacts of the tourism sector on waste management.

Waste collection in Cabo Verde is managed primarily by municipalities, with a mix of private and public companies involved, and with varying waste management practices. Most islands engage in unsegregated waste collection from outdoor containers, or door-to-door services. The public waste management service is funded through property tax and other municipal revenues, rather than by point of use. Disposal practices in Cabo Verde typically involve transporting waste to open-air landfills or dumpsites, where it is compacted but not always covered. There is an engineered sanitary landfill in Santiago, but it has persistent operational issues. The country has numerous uncontrolled dumpsites that pose significant environmental and public health risks. The illegal burning of waste is common at many of these sites. While medical waste is routinely separated and often disposed of separately, hazardous waste, including medical waste, has been observed at some landfills. Since most municipalities undertake little enforcement on tariffs, all costs are covered by ANAS.

Despite these challenges, there are several opportunities for improvement, especially through private sector investment.⁹⁷ The implementation of a waste hierarchy is essential for shaping future public policy and actions. This involves prioritizing waste reduction, reuse, and recycling while recognizing the adverse effects of poor waste management on the tourism industry. Transitioning from numerous, small, uncontrolled dumpsites to fewer, well-managed, municipal engineered landfills is an important step. These landfills should include features like leachate control systems to prevent groundwater contamination, biogas capture for energy production, and energy recovery systems. Additionally, integrating these landfills with recycling centers and public education facilities could enhance community awareness and participation in waste management.

Strengthening partnerships between the public, private, and nonprofit sectors is critical for creating a cohesive waste collection and management system. Establishing Extended Producer Responsibility frameworks can ensure that producers take responsibility for the entire lifecycle of their products, particularly in packaging. Expanding collection and recycling facilities, especially for plastic waste, is vital. This includes setting up decentralized facilities for PET (polyethylene terephthalate) recovery, particularly in the Barlavento Islands, to improve national recycling efforts. Addressing dumpsite pollution through remediation, and preventing unauthorized burning, are also fundamental to reducing public health risks. Investing in new landfill infrastructure and extending existing sanitary landfills, such as the one in Santiago, will help manage waste more effectively across various islands. Promoting cost recovery from large producers, including airports, hotels and restaurants, can support the financial sustainability of the waste sector.

Formalizing organic waste collection involves establishing a network of collection and treatment facilities across the country. This could support the reuse of organic waste in agriculture and explore opportunities for biorefinery or anaerobic digestion, particularly on resort islands like Sal and Boa Vista, where hotel food waste from is significant. Enhancing small-scale recycling and reuse initiatives, such as recycling PET,

film, paper and cardboard, glass crushing, and reusing cooking oil, can also contribute to waste reduction. Improving the management and financing of existing waste systems, especially on São Vicente and Santo Antão, installing infrastructure, implementing communication strategies, and enforcing regulations, as outlined in the OWMPS, will further support these efforts.

4.5. Digital development in support of the transition

Climate change can adversely impact Cabo Verde's rich digital and communications network infrastructure. Sitting at the nexus of six international fiber-optic submarine cables, Cabo Verde holds a strategic advantage in connecting African, European, and South American countries with one another. Expected increases in submarine cables over the next five years are set to substantially boost the country's internet speed and bandwidth, enhance the network's reliability, and reduce end user costs. This, coupled with GoCV's investments in nurturing the digital ecosystem, could position Cabo Verde as a regional hub for digital services.

However, extreme weather and climate events could cause grave damage to or loss of digital infrastructure⁹⁸ and digitally enabled services, which would adversely affect the dependability of internet access. This could disrupt economic activity and expose the country, including the government, businesses and citizens, to higher cybersecurity risks. Climate-driven disruptions could also increase the costs of digital infrastructure maintenance and rehabilitation, and overall make digital connectivity more expensive. In turn, this could stump the country's efforts to develop fintech subsectors for critical value chains to help unlock the country's digital potential.

Inter-island broadband connectivity is central to the integration of fragmented markets. Cabo Verde's fragmented geography requires the duplication of major digital infrastructure, such as broadband backbone networks (both fixed and wireless) and submarine cable landing stations. This raises investment and maintenance costs. In addition, the unique topography, characterized by steep slopes and unstable terrain that is prone to landslides and rock falls, combined with the country's vulnerability to climate change events and natural hazards, makes it more expensive to build and maintain digital infrastructure such as mobile broadband pilons, fiber cable networks, and landing stations.

The government has simultaneously subscribed to ambitious commitments for strengthening climate resilience and mitigation, as well as promoting digital transformation to position Cabo Verde as a digital hub capable of hosting technology solution providers, nurturing ICT talent, and adopting productivity-boosting new technologies. As outlined in the strategic development planning document, PEDS II, the government is pursuing gradual economic diversification away from tourism,⁹⁹ currently the country's main driver of economic growth, through investments in the ICT, energy, and blue economy (including fisheries) sectors. The objective is to establish Cabo Verde as a circular economy hub in the mid-Atlantic while achieving environmental sustainability. The government has also recently issued decree laws for Cabo Verdean firms to adopt digital signatures and e-procurement, and to transition from traditional service delivery to e-services to potentially cut GHG emissions and enhance the resilience of public services against natural disasters.

With its high levels of investment in digital infrastructure, Cabo Verde is highly exposed to intensifying climate-related shocks that can have potentially significant socioeconomic impacts; this makes it critical to enhance mitigation and resilience strategies. Climate change ICT-related adaptation options include developing back-up services, planning and preparing for outages, moving above-ground cables belowground, and relocating critical, coastally located system components.

This CCDD could assist Cabo Verde to advance by means of the following four initiatives:

- 1) **Improving digital infrastructure:** To minimize the disruption and damage climate change-induced weather events could wreak upon services and networks, GoCV must invest in improvements to the network infrastructure, and incorporate climate change considerations into plans for future networks—in particular, landing stations, the fiber backbone, microwave towers, last-mile facilities, and data centers. These investments must consider potential climate change impacts on below-ground and above-ground infrastructure, and on wireless, radio, or satellite-based services.¹⁰⁰ New and existing submarine cable-landing stations will also need to be monitored closely, considering their proximity to the coastline.
- 2) **Enhancing climate change monitoring, decision-making, and preparation:** Access to accurate, up-to-date information about the full range of potential hazards and risks allows decision-makers to make informed and balanced choices and to take the most cost-effective measures to protect communities, infrastructure, and the environment. At every stage of the process of compiling this vast quantity of data from sensors in real time, digital technologies will be needed to forecast possible future events. It will also be important to use remote mechanisms that leverage technology-enabled emergency response—in particular, mobile applications, USSD services, drones—to deliver social assistance to exposed and vulnerable groups.
- 3) **Building digital skills:** Capacity building and reskilling in high-value green sectors, with a special focus on women and youth, are all-important. For example, the huge range of observation and monitoring data that are required to predict and forecast complex changes in climate—discussed in the previous bullet point—demand specialized skills in big data and analysis. As a result, big data will be linked to value only if they are used in proactive measures to predict and forecast future changes. The GoCV must help creating job opportunities by assisting Cabo Verdeans to develop specialized knowhow and skills in information analysis and big data.
- 4) **Promoting business innovation:** Policy reforms and public investments in the circular and blue economies can open up opportunities for local startups to develop green fintechs. Digitalization could also offer options for entrepreneurs to create sustainable jobs in a range of sectors, from startups and water to agriculture technologies and payment services. Green jobs, particularly in Cabo Verde’s digital sector, may help reduce the gender gap in labor force participation.

4.6. Policy recommendations for a low-carbon development pathway

Table 4.1 presents policy options to facilitate a low-carbon transition in the most vital sectors.

Table 4.1. Policy recommendations for a resilient development pathway

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
High-level Objective 6: Advance the green transition in energy, transport and waste						
Energy	Complete sector demerger and privatization	Priority: High Timeline: Short term	Affordability: need to address the risk of revenues that fall below cost recovery levels Institutional readiness: limited coordination across actors	Ministry of Industry, Trade and Energy ELECTRA AEB	New institutions created – EDEC, ONSEC, EDEC Privatization transactions completed for EDEC and EPEC	Public budget/ concessional resources

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
Energy	Institutional capacity building for ONSEC as a single buyer and system operator, MICE, ARME and other institutions	Priority: High Timeline: Medium term	Institutional readiness: limited coordination across actors	Ministry of Industry, Trade and Energy ONSEC ARME	ONSEC fully functional Improved MICE's planning capacity for energy transition Improved regulatory oversight to ensure quality	Public budget/ concessional resources
Energy	Modernize the grid and invest in storage capacity, in anticipation of additional demand from EV	Priority: Medium Timeline: Long term	Affordability: budgetary constraints Financing: need to confirm business model with the private sector Institutional readiness: planning - need to update least-cost energy master plan Structural: geomorphology of islands	Ministry of Industry, Trade and Energy ELECTRA AEB	Percentage of grid modernized Deployment of storage solutions	Public budget/ concessional resources Private sector participation needed
Energy	Mobilize private funds through derisking facilities, project pipeline development, transaction advisory support, procurement strategies to aggregate small projects	Priority: High Timeline: Long term	Affordability: budgetary constraints on required public investments for derisking Institutional readiness: planning - need to update least-cost energy master plan	Ministry of Industry, Trade and Energy ONSEC	Private funds mobilized	Public budget/ concessional resources Private sector participation needed
Energy	Increase renewable energy penetration and innovation (for example, green hydrogen)	Priority: High Timeline: Medium term	Affordability: budgetary constraints, limited ability to provide financial incentives Institutional readiness: planning - need to update least cost energy master plan	Ministry of Industry, Trade and Energy ONSEC	Share of RE in power generation in 2030	Public budget/ concessional resources Private sector participation needed
Energy	Sustainable business models for distributed generation and energy efficiency	Priority: High Timeline: Medium term	Affordability: budgetary constraints, limited ability to provide financial incentives Institutional readiness: skills development	Ministry of Industry, Trade and Energy	RE (MW) of distribution generation by 2030 Energy savings by 2030	Public budget/ concessional resources Private sector participation needed
Energy	Regulation incentives to SMEs, ESCOs and domestic users, taxation	Priority: High Timeline: Medium term	Affordability: budgetary constraints, limited ability to provide financial incentives. Political economy: opposition from users	Ministry of Industry, Trade and Energy	Incentives are deployed	Public budget/ concessional resources
Energy	Skills and training for technicians, auditors and certified evaluators	Priority: Medium Timeline: Long term	Institutional readiness: capacity constraints Limited labor market	Ministry of Industry, Trade and Energy	Number of new technicians trained	Public budget/ concessional resources Private sector participation possible

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
Transport	Promote sustainable mobility	Priority: Medium Timeline: Medium term	Focus on transition to EV, when a more-systematic Avoid-Shift-Improve approach should be applied through urban mobility planning. The business model and financing are unclear.	MIPH Internal Administration Ministry Municipalities	Availability, reliability and comfort of public transport	Public budget
Transport	Achieve e-mobility targets on public fleet and public charging infrastructure	Priority: Low Timeline: Long term	Affordability: budgetary constraints, limited ability to provide financial incentives The business model and financing are unclear: need to confirm (i) business model with private sector and (ii) transition strategy for public transport (define a model and a plan for bus fleet renewal) Market: limited size of the market for cost recovery	Ministry of Tourism and Transport	Replacement of public fleet (2030) Investments in public infrastructure	Public budget
Transport	Deploy supportive policy and regulations for e-mobility (for example, time-of-use tariffs for charging in RE availability periods, financial incentives)	Priority: Low Timeline: Long term	Institutional readiness: complexity of policy framework, capacity constraints, coordination across sectors Affordability: limited ability to provide financial incentives Financing: need to confirm business model with private sector	Ministry of Tourism and Transport Ministry of Industry, Trade and Energy	Deployment of an enabling regulatory framework	Public budget/ concessional resources
Solid Waste	Deploy integrated waste management systems, invest in engineered landfills and expand recycling. Initiate separation at source.	Priority: Medium Timeline: Long term	Affordability: budgetary constraints; high cost of separation at source Financing: need to confirm business model with private sector Market: limited size of the market Structural: cost of logistical solutions for aggregating waste material	Ministry of Agriculture and the Environment	Share of Operation Waste Management Plans fully implemented	Public budget/ concessional resources Private sector participation needed
Solid Waste	Improve regulations and financing, including tariff system	Priority: Medium Timeline: Medium term	Institutional readiness: complexity of policy framework, capacity constraints Political economy: opposition from users	Ministry of Agriculture and the Environment Ministry of Finance	Tariff systems are updated and enforced	Public budget/ concessional resources
Solid Waste	Strengthen waste partnerships between public, private and third sector	Priority: High Timeline: Long term	Market: limited size of the market	Ministry of Agriculture and the Environment Private Operators	Effective implementation of EPR frameworks	Public budget/ concessional resources Private sector participation needed
Digital Development	Climate proof digital infrastructure to minimize disruption and damage to services and networks	Priority: Medium Timeline: Medium term	Affordability: budgetary constraints for investments Financing: need to confirm business model with private sector Structural: costly interventions because of topography and ocean	Various sectors Private operators	New infrastructure is designed to take climate change into account Existing infrastructure is climate-proofed	Public budget/ concessional resources Private sector participation needed

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
Digital Development	Enhance climate change monitoring, decision-making tools, and preparation, through digital technologies	Priority: High Timeline: Medium term	Affordability: budgetary constraints for investments Financing: possible co-financing with private sector for specific services	MAA National Institute of Meteorology & Geophysics	Monitoring and warning are improved	Public budget/ concessional resources Private sector participation possible
Digital Development	Building digital skills: capacity building and reskilling in high-value green sectors, with a special focus on women and youth	Priority: Medium Timeline: Medium term	Affordability: budgetary constraints for investments Market: limited number of students and emigration of skilled workers to other markets	Ministry of Education	Number of skilled workers in ICT increases	Public budget/ concessional resources Private sector participation possible

Note: Barriers are classified as (1) affordability, (2) financing, (3) political economy, (4) institutional readiness, (5) structural, or (6) market.



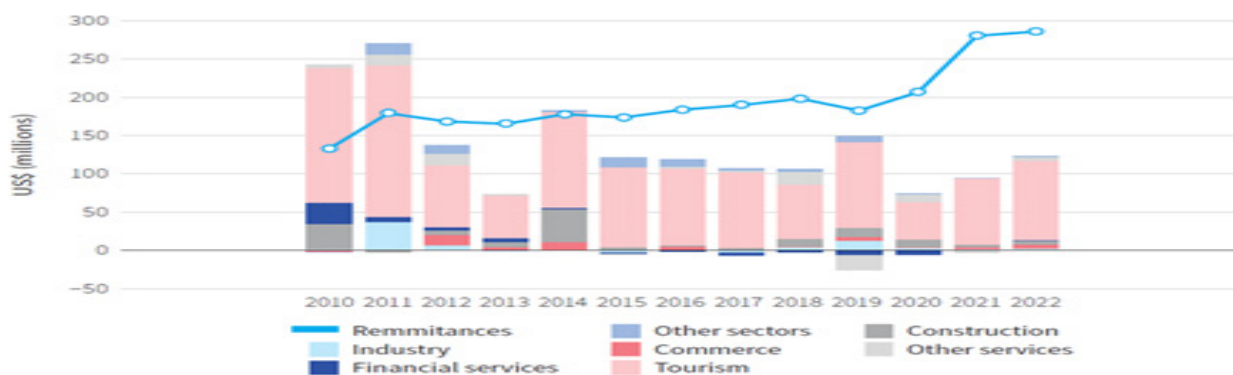
5. Building the Resilience of Firms and Households

5.1. Firms need greater support to build resilience amid climate change

Cabo Verde’s private sector, dominated by MSMEs, faces productivity challenges and is heavily reliant on foreign investment. The Cabo Verdean private sector is heavily concentrated on the three islands—Santiago, São Vicente, and Sal—with over 75 percent of 11,000 active companies located there, accounting for 95 percent of national output in 2018 and 85 percent of formal jobs. MSMEs constitute nearly 98 percent of formal companies in Cabo Verde, sustaining 55 percent of total employment, with women representing 41.5 percent of formal employees. Productivity levels are comparatively low: firms in Cabo Verde require more workers to achieve similar outputs than in peers. Larger, foreign, exporting, and older firms typically exhibit higher productivity levels and are primarily located on major islands like Santiago, São Vicente, Sal, and Boa Vista, where they contribute to formal jobs in the tourism sector.

Cabo Verde’s productivity challenges are exacerbated by informality: in 2022, approximately 53 percent of the working-age population were engaged in informal activities. These challenges are compounded by a heavy reliance on international investment and trade flows, making Cabo Verde vulnerable to external shocks. FDI has been a major contributor to growth of Cabo Verde, but its concentration in all-inclusive resorts has limited economic linkages and spillovers, hindering local economic growth and job creation. Additionally, the reliance on international investment and tourism exposes the private sector to fluctuations in global markets, as seen during the COVID-19 pandemic.

Figure 5.1. Tourism drove foreign direct investment inflows into Cabo Verde, 2010–2022



Source: Original compilation based on data from Banco de Cabo Verde (BCV), External Sector Database (last accessed December 21, 2024), <https://www.bcv.cv>

Note: FDI = Foreign direct investment.

Firm competitiveness in Cabo Verde has several barriers, including access to finance and high energy and broadband costs, which in turn inhibit firms from investing in climate-smart practices and technology. Access to finance is hindered by high lending rates and limited competition in the credit market, particularly for MSMEs. The microfinance sector, heavily reliant on donor funding, has been growing recently but lacks financial sustainability. Inadequate financial infrastructure, including weak insolvency regimes and inefficient credit reporting systems, complicate credit allocation. Additionally, inadequate or absent financial reporting and auditing practices at many firms create obstacles to accessing bank credit.

Addressing these barriers would require comprehensive reforms to improve financial infrastructure, strengthen the microfinance sector, and enforce accounting standards to facilitate access to finance for climate-resilient investments.

Cabo Verde has some of the highest electricity prices in Africa. Energy affordability is therefore one of the most significant threats to private sector competitiveness, driving the sector to look for more cost-effective and sustainable solutions. High internet connectivity costs hinder small businesses from integrating into dynamic value chains, and consequently delays their adoption of technology and modernization.

Businesses in Cabo Verde also lack the resources they need to improve their adaptation to climate change.

According to a 2022 firm capability survey referenced in the 2024 IFC CPSD, 36 percent of firms said the development of business continuity plans was the most important area in which they needed support. In second place was the need to adopt climate-resilient technologies and production practices. The high percentage of non-empty responses to the survey suggests heightened awareness of climate risks among the interviewed firms. Given the high exposure of Cabo Verde's private sector to climate shocks, the business ecosystem could be reformed to emphasize support to firms that are trying to adopt climate-smart practices. Additionally, contingent support should be offered to small firms in case of extreme weather events.

The GoCV has put in place various programs to help improve MSMEs' access to finance, yet challenges remain. ProGarante, ProEmpresa, ProCapital, and ProImpacto are initiatives to provide MSMEs with guarantees, technical assistance, and venture capital, but they need to improve their sustainability, risk management, and investment strategies.

Box 5.1. How ProEmpresa, ProGarante and ProImpacto support small businesses

Cabo Verde's business support ecosystem, which includes entities like ProEmpresa, ProGarante and ProImpacto, has greatly facilitated MSMEs' access to finance, capital, and technical assistance through enhanced support mechanisms, particularly in response to the pandemic.

The World Bank has provided support to all three entities through the Access to Finance for MSMEs project. During COVID, **ProGarante** provided MSMEs with portfolio partial credit guarantees through local commercial banks, enabling quick liquidity and cash-flow support to affected businesses, and safeguarding an estimated 17,000 jobs by project-end. As of June 2023, and through collaborations with 10 participating financial institutions, ProGarante has provided guarantees to 2,167 MSMEs, totaling about US\$50.3 million in new credits for cash-flow and investment support credit. Additionally, its own financial sustainability was enhanced: audited reports and accounts demonstrated its positive cash flow and operational sustainability.

ProEmpresa supports MSMEs by co-funding technical assistance for business development services, in addition to supporting some small-productivity goods (through a matching grant mechanism), thus improving MSMEs' productivity and ability to instruct loan applications. Despite initial delays in implementation, ProEmpresa's matching grant program experienced increased momentum in applications during 2022, with about 488 MSMEs supported by project closure, exceeding the original target. The program's success is reflected in satisfaction surveys, with 72 percent of beneficiaries feeling that project activities reflected their needs.

The third of these instruments—**ProImpacto**—is a new, publicly supported venture capital instrument that intends to help high-potential MSMEs leverage access to long-term capital through minority equity investments. As of 2024, it had committed to four direct investments, with a growing pipeline under due diligence.

Overall, these initiatives have been instrumental in providing MSMEs with essential support, notably in access to credit supply and demand angles, contributing to Cabo Verde's economic resilience and recovery amid the challenges posed by the pandemic.

The ongoing program of privatization, divestiture, and public–private partnerships in Cabo Verde is positioned to significantly attract private capital for infrastructure services (box 5.2). Recognizing the importance of PPPs in infrastructure procurement and financing, the government is collaborating with international partners like the World Bank and the Public–Private Infrastructure Advisory Facility (PPIAF) to update the PPP framework and identify suitable projects. Recently, consultants have been engaged to review and upgrade the PPP diagnostic report, with a focus on regulatory capacity building and fiscal risk monitoring.

Box 5.2. An overview of Cabo Verde’s privatization agenda

Cabo Verde’s Privatization, Divestiture, and PPP agenda, adopted through Council of Ministers Resolution 104/2022, represents a strategic approach to enhancing infrastructure services and accelerating economic growth through private sector involvement. Backed by initiatives from the Government, international organizations like the World Bank and the PPIAF have been pivotal in supporting the country’s efforts in this domain. Specifically, the agenda aims to leverage private capital and expertise to address the country’s infrastructure deficit and improve the efficiency and quality of services like transport, energy, digital connectivity, and water supply.

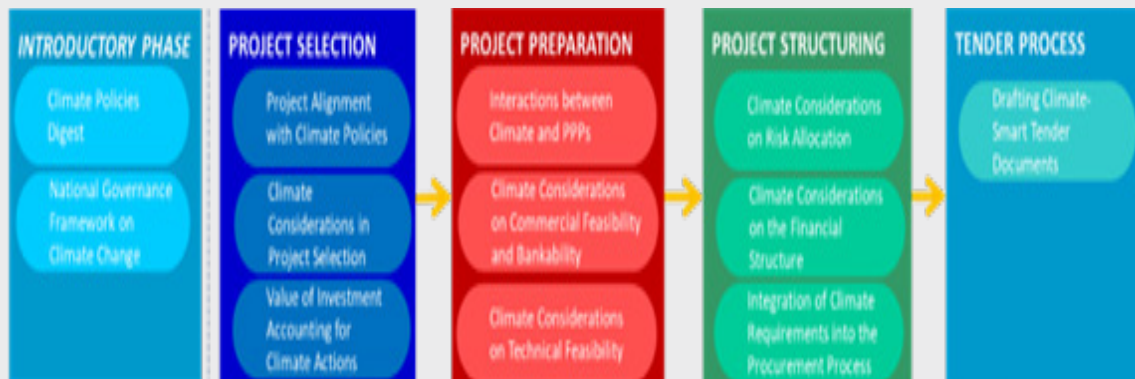
In the pipeline for privatization or PPPs are ventures such as the management and operation of airports and aerodromes, as evidenced by a recent concession contract signed with Cabo Verde Airports SA, a subsidiary of Vinci Airport SAS, and ANA Aeroportos de Portugal. An Inter-Island Maritime Passenger and Cargo Transport Services concession has also been awarded to Transinsular (Group ETE, Portugal) to improve maritime connectivity and services.

However, Cabo Verde faces several challenges in implementing its PPP framework effectively. Despite recent transactions with private sector partners, there is widespread dissatisfaction with the outcomes and processes. Issues include a lack of transparency, faulty concession design, and premature contract renegotiations. The existing legal and institutional framework also presents hurdles, such as unclear roles and responsibilities among government agencies, and inadequate planning processes. The consequences range from improper regulatory accounting to nonbankable projects and higher costs for consumers. While the airport concession is a promising step forward, there is still a need to enhance institutional capacity, improve transparency, and undertake proper contract management.

By infusing climate considerations into the PPP cycle, the privatization, divestiture, and PPP program can make infrastructure projects more climate-resilient (box 5.3). Hazards such as more frequent and severe extreme weather events, rising sea levels, and altered precipitation patterns can disrupt vital services like transport, energy, digital connectivity, and water supply. By integrating climate considerations into the PPP cycle, infrastructure projects can be designed, built, and operated to mitigate vulnerability to climate change, ensure the long-term sustainability of these services, and reduce GHG emissions. Incorporating climate into the PPP cycle involves conducting comprehensive assessments of climate risks, integrating climate adaptation and mitigation measures into project design, and accounting for the long-term financial implications of climate-related costs and benefits.

Box 5.3. Integrating climate considerations into the public–private partnership cycle

Considering the multiple ways in which climate change interacts with infrastructure, PPPs should be designed and managed to align with mitigation and adaptation objectives. The figure below illustrates how climate change considerations ideally should be integrated into the PPP cycle. For instance, a PPP manual could incorporate climate change criteria into the methodologies for project prioritization and design specifications. In the same vein, the preliminary analysis of a PPP and the risk matrix of a project should integrate adaptation scenarios and requirements.



In the PPP cycle, a key step that needs to incorporate climate considerations is determining how risk should be allocated in the contract. In infrastructure projects, climate risk allocation strategies include

- 1. Internal risks:** The private party assumes the risk of internal climate events that directly affect the project, such as damage to the infrastructure or availability disruptions. This can be managed through insurance coverage or guarantees.
- 2. External risks:** The allocation of external climate risks depends on the project type and characteristics. In some cases, the public sector may bear the risks associated with failures of interconnected infrastructure or changes in the broader socioeconomic environment. In other cases, the private party may assume these risks, especially if they can reasonably manage them.
- 3. Force majeure:** Force majeure events, such as natural disasters, are typically shared between the public and private sectors. The allocation of costs and responsibilities depends on factors such as the foreseeability of the event and the measures that could have been taken to prevent additional costs.
- 4. Insurance coverage:** Insurance plays a crucial role in managing climate risks in infrastructure projects. It can provide coverage for revenue loss, damage to infrastructure, and other climate-related risks. Insurance options may include traditional insurance policies, weather derivatives, or hybrid solutions that combine insurance with other financial instruments.
- 5. Risk-sharing policies:** Risk-sharing policies can be established to allocate climate risks between the public and private sectors. These policies define the level of risk each party assumes and the compensation or relief events in case of climate-related damage.

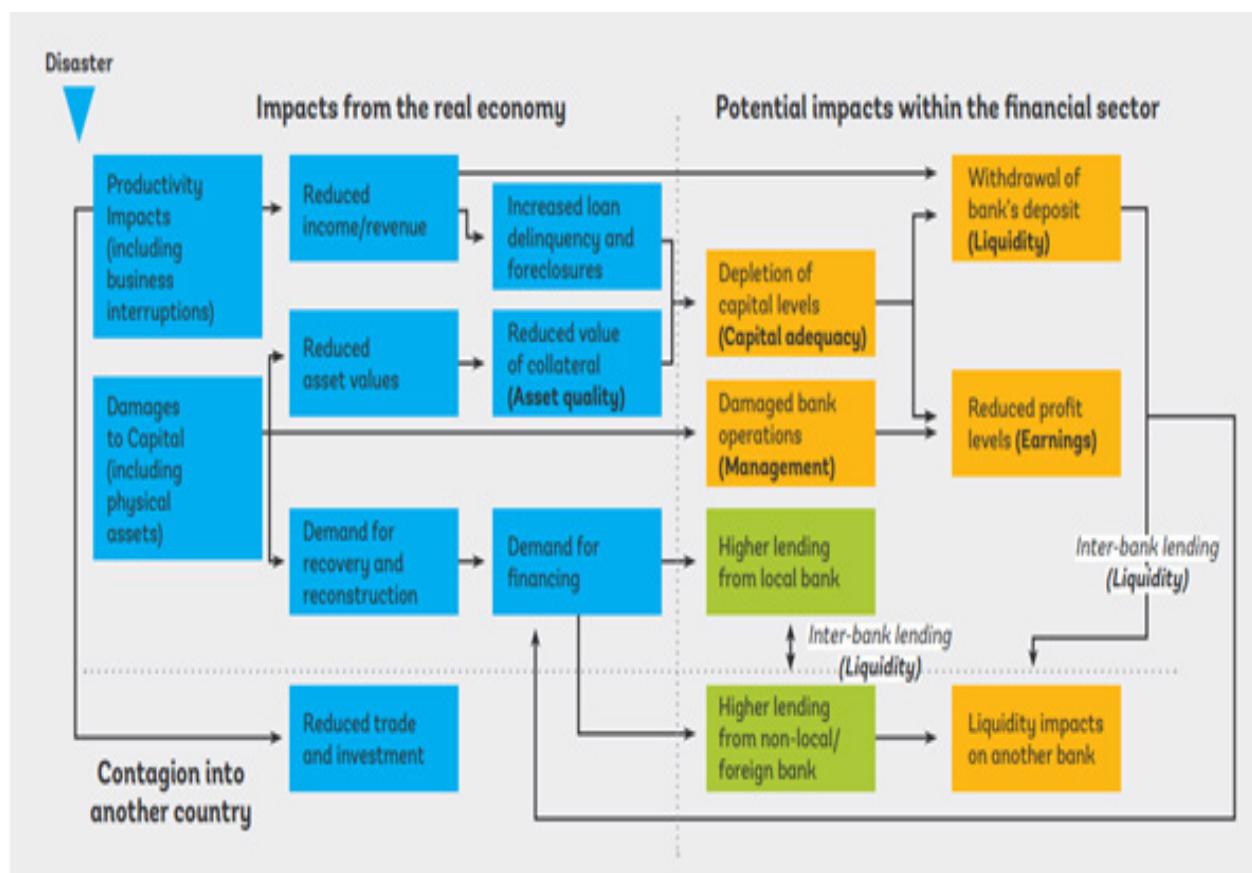
Source: World Bank, *Climate Toolkits for Infrastructure PPPs* (Washington, DC: World Bank, 2022), <https://hdl.handle.net/10986/37287>.

5.2. Financial institutions face risks from climate change and the transition

Cabo Verde's financial sector is large, banking-centric, and highly interconnected, but it is lagging in the support it offers to climate investments and MSMEs. Two systemic banks hold most of the assets and deposits (70 percent), of which the social security fund Instituto Nacional de Previdência Social (INPS) is the largest depositor. Foreign-owned banks prioritize liquidity and rely heavily on deposits. There are government-backed SME support programs in place, as mentioned in section 5.1, but they need further improvement. The Secured Transaction framework and the Credit Registry have improved collateral use and credit scoring, but long-term financing is limited by the small number of market players and a preference for holding securities to maturity. INPS, as a major institutional investor, could leverage its assets more effectively for economic development.

Climate risks can affect the financial sector through macro and micro transmission channels. Channels refer to the pathways through which climate change can impact macroeconomic variables, the value of a company's activities, or the extent of its financial exposure (figure 5.2). Identifying the main transmission channels that could turn climate risk drivers into financial risks for banks is therefore important to ensure the stability of the financial sector while it intermediates resources for climate change adaptation and mitigation. To reflect this, the Central Bank is developing guidelines and a climate-related taxonomy to help banks manage risk and identify opportunities.

Figure 5.2. Climate risks can affect the banking sector through multiple channels



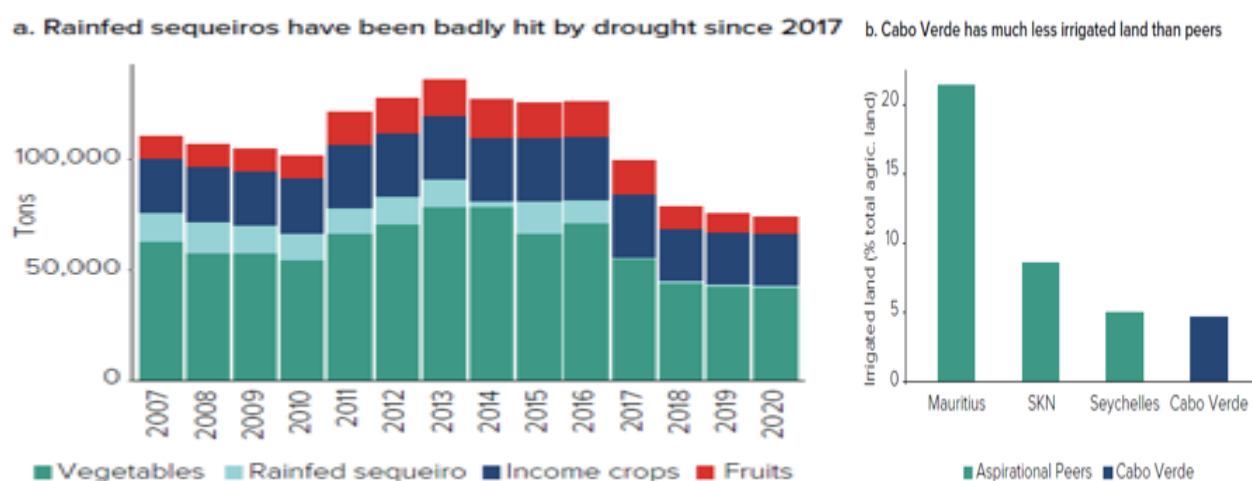
Source: Ranger, Nicola Ann Ranger, Olivier Mahul, and Irene Monasterolo, *Assessing Financial Risks from Physical Climate Shocks: A Framework for Scenario Generation* (Washington, DC: World Bank, 2022)

<http://documents.worldbank.org/curated/en/760481644944260441/Assessing-Financial-Risks-from-Physical-Climate-Shocks-A-Framework-for-Scenario-Generation>.

Physical risks and transmission channels for the financial sector

Physical risks can directly affect various economic sectors, including the financial assets and economic activities that are exposed to those risks. For example, the agriculture sector, which employs 15 percent of the population and accounts for 8 percent of GDP, is a key transmission channel of physical risks to the financial sector. Agricultural land accounts for 19.6 percent of total land area and the sector mainly relies on subsistence family production. Cabo Verde's dry and unpredictable climate poses significant risks for agriculture, which depends on rainfall for groundwater recharge, rainfed production, and irrigation systems (figure 5.3). Recurrent droughts and worsening agricultural conditions have pushed rural populations into cities and tourism jobs. Flooding and sea-level rise can also impair the value and repayment capacity of bank loans secured by vulnerable properties. As of September 2021, housing credit amounted to 30 percent of total gross loans and 65 percent of total credit to households. The banking sector's exposure to physical risks in mortgage loans may be aggravated by operational conditions, such as collateral lending and the absence of loan-to-value regulation.

Figure 5.3. Low levels of irrigation have exposed the agricultural sector to drought



Source: World Bank, *Sailing Rough Seas*

Note: Sequeiros are traditional agricultural systems in Cabo Verde in which crops are grown without irrigation, relying solely on rainfall.

Assessing bank exposure to physical climate risks requires granular data that is currently unavailable. The financial sector must manage its climate-related risks, as these may affect financial stability. This requires assessing the sector's climate shock resilience using stress testing of exposure to physical risks and risk management frameworks. The authorities need to identify the data to collect. These may include detailed geographic data of the location of bank assets to map them against location-specific climate vulnerabilities. They may also include more granular information on sectoral exposure to physical risks.

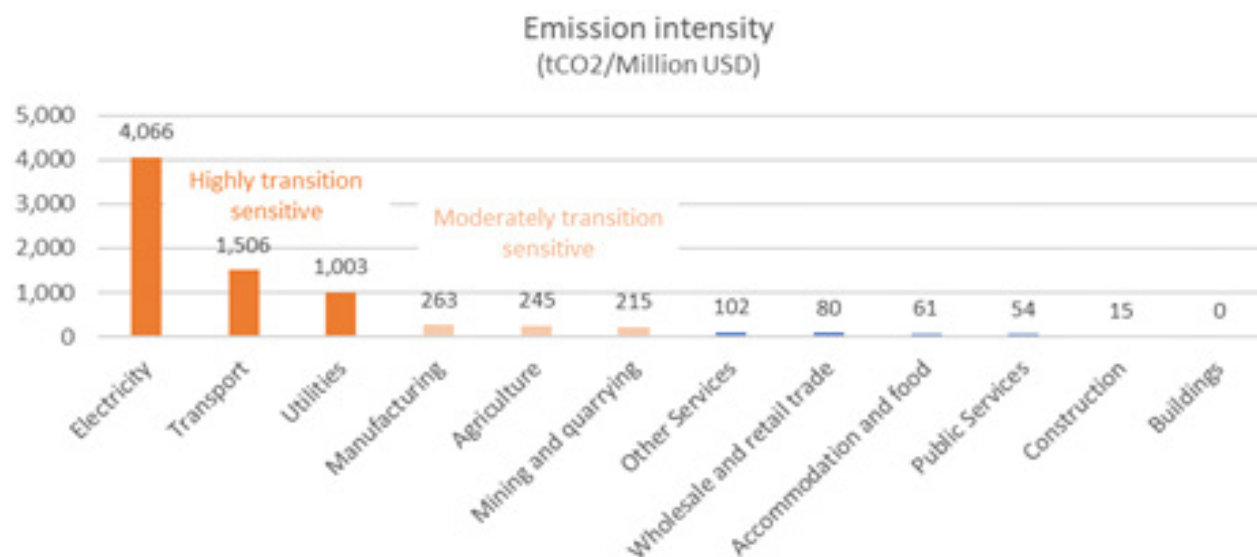
Transition risks to the financial sector and their transmission channels

Cabo Verde faces transition risks from its dependence on fossil fuel imports. Carbon pricing and low-carbon policies may initially slow economic growth that is heavily reliant on fossil fuels, but they will likely offer longer-term benefits, such as promoting sustainable industries and reducing dependency on imported energy. Any increase in government spending to offset the transition policy shift may be limited by high public debt. Since banks and insurance firms hold substantial amounts of public sector assets, increased

issuance by the government may also crowd out private sector capital. The risks are often not isolated but interconnected and may interact with external events. This may amplify their effects in unpredictable ways. For example, the COVID pandemic and Russia’s invasion of Ukraine illustrate the gravity of compounding risks (for instance, fossil fuels and food prices).

The banking sector’s exposure to transition risks comes from its lending to sectors with high GHG emission intensity or high fossil fuel consumption. Electricity generation is the main GHG emitter in the Cabo Verde (figure 5.4), with the electricity coming from thermal power plants using diesel and fuel oil. Other sensitive activities include transport (motor vehicles and sea vessels), agriculture and livestock farming (enteric fermentation, manure management, waste burning, and fertilizer use), water (desalination and irrigation), the industrial sector,¹⁰¹ the fishing industry (ice production and transport at sea, mostly involving MSMEs), and tourism, which uses 20 percent of the electricity supply.

Figure 5.4. Economic sectors vary in their emission intensity and transition sensitivity



Source: World Bank EITE Country Comparison Tool, 2014 Global Trade Analysis Project (GTAP) emissions¹⁰² and production data

Some financial institutions in Cabo Verde, because of their significant role in intermediating long-term resources, may face heightened exposure to transition risks. Although the availability of long-term funding is, all things considered, a strength of Cabo Verde’s financial sector that stands out within the region, it also amplifies the risk of stranded assets. The implications for financial stability will depend on the speed of the country’s transition to a low-carbon economy and the composition of bank loan portfolios.

Moreover, given the concentrated structure of Cabo Verde’s banking sector, particular attention must be paid to systemically important banks during the transition. Transition risk exposure may vary significantly among individual banks, influenced by their specific areas of specialization. To enable a robust macro- or micro-prudential assessment of transition risk in Cabo Verde’s financial sector, gathering detailed data on the sectoral distribution of loans and bank-level exposure is essential.

Reforms aimed at fostering competition and improving the regulatory environment are essential to attract and sustain private investment in Cabo Verde. To create a more competitive market landscape, the country must address regulatory barriers that deter private sector participation and ensure robust safeguards that protect fair competition. Strengthening institutional capacity to effectively implement and enforce regulations

is pivotal to drawing in investments and enabling Cabo Verdean businesses to compete on a global scale. As a small-island economy, Cabo Verde faces unique challenges, including market concentration, significant state involvement in key productive sectors, and regulations that elevate operational costs. These challenges are compounded by weak enforcement mechanisms that further hinder market efficiency. The following three recommendations outline steps to implement competition-enhancing reforms:

- 1) Recalibrate the business of the state in competitive sectors to allow private entry and competition. In 2019 the government held stakes in 33 firms that account for 18 percent of GDP and employ over 3,100 workers. Strategies include unbundling services, promote PPPs, and divesting as needed. The subsidiary model could guide decisions on state ownership versus private involvement.
- 2) Enhance market liberalization by implementing risk-based licensing, adjusting price controls, and promoting infrastructure operation sharing in crucial sectors. Limited competition leads to high costs of internet, energy, and unreliable services, which affects Cabo Verde's attractiveness to tourists.
- 3) Strengthen the new competition authority established in 2022 through additional resources and a clear delineation of functions across sectoral regulators for more effective oversight. A robust competition policy is essential for facilitating private investment and enforcing pro-competition rules that maintain a level playing field. Cabo Verde can capitalize on significant opportunities for growth by opening markets, reforming regulations, and enhancing institutional capabilities.

5.3. Building social resilience can reduce climate change impacts and support more inclusive growth

5.3.1. Shock-responsive social protection exists in Cabo Verde

Cabo Verde's social protection system is relatively advanced compared to that of other Sub-Saharan African countries, with a range of programs that address vulnerability within the population. The country has a robust policy and legal framework for social protection, but the social protection system could be more efficient and effective by improving coordination across programs. To better address climate change, the government needs to continue strengthening the delivery process and improve social protection system's shock responsiveness.

In Cabo Verde, there are two types of social protection programs and interventions that respond to risks and disasters: (1) cash transfers, which were used, for example, to mitigate the impact of the COVID-19 pandemic;¹⁰³ and (2) public works and in-kind transfers, which aim to reduce the effects of drought on agriculture-based firms and households.¹⁰⁴ To make safety nets more adaptive and suitable for building climate resilience, several measures have been introduced. They include strengthening the social registry, institutionalizing the emergency cash transfer interventions, sourcing financing, creating links with disaster risk management (DRM) and early-warning systems, and promoting income generation for medium- to long-term resilience. Each of these is described below.

Social registry

Cabo Verde's Social Registry, CSU (*Cadastro Social Unico*) is well consolidated and performs well. It uses georeferenced information on vulnerable households and individuals to identify and target those most at risk from climate-related shocks. This helps social protection programs provide timely and adequate support during crises. The CSU covers about 66 percent of the population and is used by 9 social programs (including energy, housing, and pensions). This improves coordination and prioritization across sectors.

The CSU's shock responsiveness could be strengthened by including risk maps in its geographic database and reinforcing the feedback loop of programs that respond to shocks. The inclusion of maps of exposure to different risks in the CSU's geographic database would make it possible to know the number and characteristics of families that are in an area exposed to a particular risk, especially in anticipation of the occurrence of a shock/disaster.¹⁰⁵ Reinforcing the feedback loop of programs that respond to shocks into the CSU, such as the drought mitigation and resilience programs designed and coordinated by the Ministry of Agriculture and Environment (Ministério de Agricultura e Ambiente – MAA), would also improve complementarity and coordination. It could also capitalize on the Family Support Program¹⁰⁶ to update or insert data on families' exposure to risks into the CSU, reflecting such key household vulnerability data as intra-household dependency ratios, female-headedness, housing type, and natural resource-dependent livelihoods base (for example, agriculture or fisheries).

Emergency Cash Transfer Program

The National Strategy for Disaster Risk Reduction (ENRRD) and the Post-Disaster Recovery Framework both recognize cash transfers as a primary social protection mechanism for different phases of the disaster management cycle. RSIE, the national emergency cash transfer program, is the main government tool for providing immediate financial assistance to individuals and households affected by shocks. The RSIE was first deployed in June 2020 in response to the COVID crisis, and then institutionalized through Decree-Law no. 33 of 27 July 2022, with an operational manual to guide its quick and efficient implementation in the event of a shock.

The RSIE could be further strengthened by more sharply defining the mechanism that could trigger its activation, as well as the criteria for determining its beneficiaries. The ENRRD has plans to develop an early-warning system but it is not yet operational, and there is no effective national multi-hazard system to respond to the various hazards the country faces.¹⁰⁷ The general requirements and conditions for the RSIE are set out in article 6 of the decree law, but the specific conditions for identifying and selecting beneficiaries will have to be adjusted to the each person's particular situation of vulnerability and exposure to the shock, recognizing the range of potential targeting approaches, including but not limited to area-based targeting.¹⁰⁸

Financing

Funding sources for shock-responsive social protection are scarce and depend on the declaration of a contingency or disaster situation. The ENRRD and the QRP rely on ex-post mechanisms of emergency assistance and reconstruction funding, rather than proactive investments in risk reduction and mitigation, including use of early-warning systems and investments in community-preparedness, including strengthening the role of women in disaster risk reduction and participatory risk mapping. The National Emergency Fund, FNE, and the Sovereign Emergency Fund have limitations for financing cash transfer programs such as the Shock Responsive Social Protection Initiative (RSIE). The MAIS Fund, a social protection fund created to eradicate extreme poverty, could be a source of funding for the RSIE.

The Ministry of Family, Inclusion and Social Development (MFIDS) could strengthen coordination with other ministries and agencies involved in DRM and early-warning systems to activate the RSIE in a timely manner. The MFIDS has an executing role in the ENRRD and the QRP and participates in the inter-ministerial spaces for emergency management and monitoring of precipitation and food and nutrition security levels. The MFIDS should also enhance the complementarity of the RSIE with the drought mitigation and resilience programs designed and coordinated by the MAA.

Links with DRM/early-warning systems

The MAA's drought mitigation and resilience programs target beneficiaries through the CSU and offer various safety net instruments, such as public works or productive inclusion, to restore or diversify families' productive assets and build skills for climate-resilient livelihoods. To enhance the complementarity of these programs with the RSIE, the MFIDS could, as it did in 2017/2018, coordinate with the MAA to support the specific needs of agricultural households affected by drought or a bad agricultural year.¹⁰⁹ However, to activate the RSIE when needed, the MFIDS needs to participate regularly in the inter-ministerial spaces for emergency management and monitoring of precipitation and food and nutrition security levels. The MFIDS has an executing role in the ENRDD and the QRP and is part of the Board of Directors of the Recovery Management Office, as well as the National Food and Nutrition Security Council.

Promoting medium- to long-term resilience

Besides providing immediate support during shocks, safety nets should also build medium- to long-term resilience for vulnerable populations to adapt to the changing climate and reduce their vulnerability to future shocks. Productive inclusion activities enhance the effects of cash transfers and support resilience building through food security, higher productivity, savings, and diversification of livelihoods toward activities that reduce their vulnerability, including to climate shocks.

The Social and Productive Inclusion Program (PISP), officially launched in January 2024, provides access to soft skills, entrepreneurial training, and a start-up grant for small businesses that targets especially women-headed households. The PISP has reached over 1,500 beneficiaries in 18 of the 22 municipalities, and the program aims to expand to more than 5,000 households throughout the country by 2026. The PISP could further strengthen its climate resilience by integrating measures such as promoting CSA practices or supporting the green transition. Other measures include providing training to upskill workers to become more productive and greener in their own occupations, and training to reskill workers to facilitate their transition to new green jobs—including in renewable energy (especially in distributed generation) and in the upgrading of MSMEs in value chains that are in priority sectors, such as in the blue economy.

5.3.2. Skills for the future

In the context of climate change, skills development is a vital component of building resilience and ensuring that Cabo Verde's workforce is prepared to tackle emerging challenges. Currently, Cabo Verde's human capital index is estimated to be 0.53, which exceeds the sub-Saharan African average but is lower than the global average of 0.57. With climate change affecting multiple sectors—from agriculture and fisheries to tourism and infrastructure—the need for a skilled, adaptable, and informed workforce has never been more pressing. Investing in education and skills development could enhance climate literacy, incentivize green entrepreneurship, and enable the population to adopt more sustainable practices, ultimately supporting the country's transition to a low-carbon, climate-resilient economy.

Cabo Verde's education system must adapt to include climate change and sustainability-focused curricula on all levels. Primary and secondary education should introduce concepts of climate science, environmental stewardship, and sustainable resource management. Vocational training programs can play a significant role in equipping youth and adults with practical skills tailored to the sectors that are the most vulnerable to climate change, such as agriculture, fisheries, tourism, and renewable energy. Higher education institutions can support research and development in climate-resilient technologies and practices, creating a new generation of climate-aware professionals.

The country's archipelago structure and diverse microclimates mean that climate impacts vary significantly from island to island. Skills development should therefore be tailored to the particular needs and resources of each island. For example, coastal communities could benefit from specialized training in sustainable fisheries and coastal ecosystem management, while inland areas might focus on climate-smart agriculture and water conservation practices. By localizing skills training programs, the education system can empower communities to manage their unique climate risks effectively.

Building skills in renewable energy—Cabo Verde has great potential for RE, particularly wind and solar. Developing a skilled workforce in RE technologies could be a game changer for the country's energy sector by reducing its reliance on imported fossil fuels while simultaneously mitigating GHG emissions. This will require not only technical skills in installing and maintaining RE infrastructure but also developing local expertise in policy, regulation, and project management to support a sustainable energy transition. A focus on green job creation in the RE sector could offer long-term employment opportunities, particularly for young people entering the labor market.

Building skills for nature-based solutions—Considering Cabo Verde's rich marine and terrestrial ecosystems, enhancing skills related to NBS is crucial. Training in coastal and marine habitat restoration—for example, mangrove reforestation, coral reef conservation—could support both climate adaptation and biodiversity conservation. Agriculture workers could be trained in agroecological practices, which use nature-based approaches to enhance soil health, water management, and pest control. Such skills development would not only build climate resilience but also contribute to sustainable livelihoods.

Cabo Verde's blue economy presents both opportunities and challenges in the context of climate change. Skills development for sustainable tourism, fisheries management, and marine conservation is vital to ensuring that these sectors can continue to thrive in the changing climate. Training programs for sustainable tourism could teach professionals how to incorporate climate-friendly practices into their operations, such as energy efficiency in hotels, eco-friendly waste management, and the promotion of eco-tourism that supports conservation efforts.

Additionally, lifelong learning opportunities should be provided to help the existing workforce pivot to climate-resilient jobs. This includes retraining workers from traditional sectors that may decline because of climate impacts—for example, traditional fishing practices—and upskilling them in emerging sectors like renewable energy and CSA. Investing in digital literacy is also essential, as digital platforms can facilitate climate-smart innovations, green products' access to markets, and remote work in a changing climate landscape.

By focusing on these broader areas of skills development, Cabo Verde could cultivate a workforce that is not only technically skilled but also adaptive, innovative, and attuned to the nuances of local climate challenges. This holistic approach to skills development will be pivotal in driving the country's climate-resilient, low-carbon growth.

5.3.3. Public health

Climate change is also contributing to the rise of several diseases in Cabo Verde. Vector-borne diseases such as dengue fever and chikungunya are becoming more prevalent globally because of increasing temperatures and changing precipitation patterns. Although Cabo Verde has been certified malaria-free, the risk of reintroduction remains a concern because of climate variability. The rise of dengue fever in late 2023 and the first half of 2024, attributed to a larger mosquito population than usual, underscores the need for the country to remain vigilant. Waterborne diseases like cholera and other diarrheal illnesses

could also rise, particularly during periods of heavy rainfall and flooding, which can contaminate water supplies. Additionally, respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD) are exacerbated by higher temperatures and increased air pollution. These health challenges underscore the need for robust public health strategies and climate adaptation measures to protect the population.

Cabo Verde is actively implementing several measures in the health sector to address the impacts of climate change. A core strategy is to build health system resilience. This involves improving the capacity of health facilities to respond to climate-related emergencies and integrating climate change considerations into health planning and policies. The country is also focusing on enhancing early-warning systems for climate-sensitive diseases, which helps in timely detection and response to outbreaks. Additionally, Cabo Verde is working on strengthening its health workforce by providing training on climate change and health, ensuring that healthcare professionals are well-equipped to handle the health impacts of climate change. The government is also investing in infrastructure improvements to make health facilities more resilient in the face of extreme weather events such as hurricanes and floods. These efforts are part of a broader strategy to mitigate the health risks associated with climate change and protect the well-being of its population.

5.3.4. Reducing gender gaps

As a lower-middle-income country, Cabo Verde performs well across a range of gender indicators, including maternal health, fertility, and girls' access to secondary education. It exhibits high educational attainment rates across its population, with girls outpacing boys for some time now. Figures from 2019 show that 75.2 percent of girls completed lower secondary school, compared to only 62 percent of boys. Such investments in female human capital, however, have not yet translated into gender parity in economic opportunities. Despite the impressive performance in education, the labor force participation rates of women lag men's overall by 14 points, with 50.5 percent of women in the workforce, compared to 64.7 percent of men in 2022. This is because of typical gender constraints such as social norms, life cycle constraints related to childbearing, and the poor provision of services such as childcare to reduce women's time poverty. The gender gap in labor force participation is particularly pronounced in rural areas, with the rural LFP gender gap being twice that of the urban. In rural areas, women enter the labor force later and leave it earlier, working just 15 years in total according to labor force data, compared to urban women's typical 30 years in the workforce.

The IMF has estimated that closing the gender gap in labor force participation in Cabo Verde could increase GDP by as much as 12 percent.¹¹⁰ Further, gendered labor market segmentation remains strong. Poverty too has a strong gender dimension in the country, with 43 percent of the extremely poor living in households headed by a single mother. Even for those women participating in the labor force, their employment is often precarious. As of 2022, 11 in 25 women ages 15–49 were in positions of vulnerable employment, defined as being self-employed or being family workers. Cabo Verde's 2014 Millennium Development Goals report¹¹¹ found that 55.4 percent of women had vulnerable jobs in 2011, compared to just 22.4 percent of men.

Cabo Verde's strong human capital base can be further leveraged through investments in active labor market policies, particularly in green sectors. A strong education infrastructure, including technical and vocational education and training (TVET), as exists in Cabo Verde could bear widespread dividends for the population in good-quality employment opportunities arising from decarbonization if attention is given to gender and socio-spatial considerations, such as supporting those from lagging areas of the country, through dedicated measures.

Increasing the share of formal sector employment among women, and increasing their time in the labor force, could be supported through such measures as childcare provision. Expanded green economic opportunities also require supporting the development of women’s own account enterprises and MSMEs, such as emerging opportunities in rooftop solar repair or sales, considering Cabo Verde’s growing participation in distributed generation of energy. Women working in utilities is another area in which the country could support women’s green employment. (Examples of this would be the experience of the WePOWER program in the energy utilities of the South Asia Region, and the global EqualAqua initiative on women in water utilities.)

In addition to norms and poverty considerations, which ongoing World Bank operations are trying to address in Cabo Verde through the use of, for example, childcare stipends, other gender constraints persist around access to finance and other productive assets, including insecure land title for women, and harm women’s economic empowerment. As with agriculture, there is scope to enhance women’s own-enterprise accounts in fisheries with finance and business development services (BDS) support.

Taking a multidimensional perspective of poverty, it will be important across all adaptation programming to ensure the safeguarding of nutrition security, water for multiple uses, and CSA extension and fisheries support, particularly for women farmers in lagging rural areas of the country, and for women engaged in the artisanal fisheries sector. This is important in the context of the fact that a quarter of Cabo Verde’s “extremely poor” residents, and another 16 percent of its “poor” population, are employed in the agriculture sector.

Cabo Verde’s NDC has a firm commitment to ensuring the mainstreaming of the gender–climate nexus into national climate development and sector planning to realize gender-transformative outcomes in the country’s climate action. This positive enabling environment for gender efforts should be leveraged by the WBG’s climate support to the country. Cabo Verde already undertakes gender budgeting exercises in its fiscal planning. Combining this lens with a climate lens to form a comprehensive gender-climate budgeting approach could have a powerful impact on the country’s ability to identify, prioritize, allocate, and design gender-responsive development and climate investment strategies. This is particularly important in the context of such sectoral interventions as disaster risk reduction, social protection, skills development, agriculture, health, and infrastructure developments in water and energy—all of which reach to the local level and can benefit from both locally-led climate action approaches and the perspective of green accountability in public finance.

Going forward, opportunities for green investments that have both gender and climate co-benefits include such areas as i) Green skills for women (including investments in STEM education and TVET, and outreach at the middle and secondary school levels to avoid the educational “streaming” of girls into exclusively non-STEM subjects); ii) Targeted adaptive social protection that considers intra-household dependency ratios and the female-headedness of households to protect women from climate-driven poverty shocks, while expanding area resilience through public works and skills for livelihood diversification; iii) Targeted school-to-work transition support, including internships and job-matching, that are norms-sensitive to expand women’s recruitment, retention, and promotion in growth sectors, including tourism and energy; iv) Enterprise development support for women-owned or women-led MSMEs in the fisheries sector; v) CSA promotion, including credit, BDS, and nutrition services support to women farmers; vi) The expansion of gender-responsive disaster risk reduction that expands women’s climate leadership in local preparedness and climate resilience; and vii) The expansion of gender-responsive planning and budgeting processes to the local level to assist wider fiscal decentralization efforts.

5.4. Policy recommendations to build firm-level and household-level resilience

Table 5.1. Policy recommendations for a resilient development pathway

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
High-level Objective 7: Support households and firms to build resilience						
Private Sector	Enhance MSMEs' access to climate finance	Priority: High Timeline: Long term	Affordability: Limited fiscal space Financing: Unavailability of financial instruments Institutional capacity and readiness: Inadequate capacity building	Central Bank/ Commercial Banks/ Chambers of Commerce Pro Garante/ Pro Capital		Public budget/ concessional resources Private sector participation needed
Private Sector	Integrate climate considerations into PPP projects	Priority: Medium Timeline: Long term	Institutional capacity and readiness: Inadequate capacity building	UASE (Unidade de Acompanhamento do Setor Empresarial do Estado)		Public budget/ concessional resources Private sector participation needed
Private Sector	Promote climate-smart investments and economic diversification and build technical capacity for climate resilience	Priority: High Timeline: Medium term	Affordability: Limited fiscal space Institutional capacity and readiness: Limited expertise to provide technical assistance	UASE Ministry of Finance and Business Development Chambers of Commerce/ Pro Empresa		Public budget/ concessional resources Private sector participation needed
Social Protection	Strengthen the shock-responsiveness of the social registry, and enhance the emergency cash transfer program RSIE	Priority: Medium Timeline: Long term	Institutional capacity and readiness: need for capacity building Coordination challenges: strong interagency coordination needed Affordability: Lack of funding			Public budget/ concessional resources
Social Protection	Integrate social protection with disaster risk management and early-warning systems	Priority: Medium Timeline: Medium term	Institutional capacity and readiness: Inadequate capacity building Coordination challenges: Need for strong cross-sectoral collaboration			Public budget/ concessional resources
Education	Integrate climate change into education curricula, expand vocational training programs to focus on climate-relevant sectors, and introduce learning programs that support green entrepreneurship	Priority: High Timeline: Long term	Affordability: budgetary constraints Institutional readiness: limited coordination across actors	Ministry of Education/ Ministry of Finance/ Directorate of Labor		Public budget/ Concessional Resources

Sector	Action	Priority/ Timeline	Key Barriers	Lead Actors	Indicators	Financing Sources
Education	Support research and innovation in higher education	Priority: Medium Timeline: Long term	Affordability: budgetary constraints	Ministry of Education/ Ministry of Finance/ Directorate of Labor		Public budget/ concessional resources
Health	Enhance vector control programs	Priority: Medium Timeline: Long term	Affordability: budgetary constraints	Ministry of Health		Public budget/ concessional resources
Health	Expand disease surveillance and early-warning systems to include climate-sensitive diseases	Priority: High Timeline: Long term	Affordability: budgetary constraints	Ministry of Health		Public budget/ concessional resources
Gender	Expand green skills development for women	Priority: Medium Timeline: Long term	Institutional capacity and readiness: Inadequate capacity building	Ministry of Education, Family, and Social Inclusion		Public budget/ concessional resources
Gender	Promote women's enterprise development, particularly in green sectors	Priority: High Timeline: Long term	Financing: Private sector reluctance Political economy considerations: legal or administrative Institutional capacity and readiness: Inadequate capacity building	Ministry of Economy and Employment; Ministry of Agriculture and Environment		Public budget/ concessional resources
Gender	Enhance targeted, adaptive social protection mechanisms	Priority: Medium Timeline: Medium term	Affordability: limited fiscal space Institutional capacity and readiness: coordination challenges	Ministry of Health and Social Security		Public budget/ concessional resources

Note: Barriers are classified as (1) affordability, (2) financing, (3) political economy, (4) institutional readiness, (5) structural, or (6) market.



6. Making It Happen: Investments, Benefits and Financing Options

6.1. Investment needs for development and climate action

An ambitious cross-sectoral climate action scenario would require substantial investment, totaling US\$842 million over 2024–2030, or US\$140 million per year, which represents 6 percent of cumulative GDP over the same period.¹¹² Over the period 2024–2050 investment needs amount to US\$2.593 billion, which represents 7.1 percent of cumulative GDP over the same period. Drawing on recommendations from chapters 3 and 4, a set of adaptation and low-carbon development policies is assembled that together would strengthen resilience in the face of climate risks and climate change, as well as contribute to Cabo Verde’s green transition. The largest needs would come from the power sector, followed by the transport sector, the agricultural sector, and the tourism sector.¹¹³ The policy package also includes significant investments in the road network, waste, water production, marine fisheries, the early-warning system, and coastal protection.

These climate investments would generate significant economic benefits in the form of higher agricultural productivity, higher tourism arrivals, reduced fuel imports, and lower air pollution.

In the tourism sector, spending to diversify the offer would support higher growth of “nature and culture” tourism and partially offset projected losses. In line with the priorities outlined in the 2022–2026 Tourism Operational Plan, a climate action strategy would develop the tourism infrastructure outside of “beach and sun” activities, enhance the sector’s sustainability, launch communication activities, enhance governance, and promote the development of appropriate skills. In simulations, higher international tourism arrivals for nature and culture activities could offset about half of the projected losses in “beach and sun” tourism caused by climate change.

In the climate-affected agricultural and fisheries sectors, climate action would generate large productivity gains. In the absence of climate action, lower rainfall would result in decreasing agricultural output from rainfed crops. Yet ambitious investments to increase irrigated areas using wastewater and to introduce drought-resistant crops and climate-smart agricultural practices could generate a substantial increase in agricultural output, which by 2050 would nearly double relative to the baseline, reversing the projected climate-induced trend in output. In the marine fisheries sector, additional investments would generate double their value in additional output. Meanwhile, adaptation investment from mechanization in agriculture would alleviate the consequences of labor heat stress, mostly borne by agricultural workers.

By averting losses from flooding events, investments in coastal protection, roads and early-warning systems would reduce losses from floods. Key adaptation policies include an important upgrading of Cabo Verde’s early-warning system, investments in building new and more resilient roads, and investing in coastal protection. Through this investment, benefits in the form of reduced annualized losses from flooding events could reach US\$15 million annually.

An ambitious green transition in the power and transport sectors would yield US\$1.8 billion in fuel savings and curb local air pollution. In the power sector, the climate action scenario considers the transition to net zero, with the share of diesel in the energy mix going from 60 percent in 2024 to 3 percent in 2050, replaced by renewable sources. The share of EVs would reach 80 percent by 2050, with new vehicles being 100 percent electric by 2050.¹¹⁴ These ambitious policies would generate US\$1.8 billion (discounted) in savings in fuel imports,¹¹⁵ to be replaced by domestic renewable sources. The green transition in power and transport would cause a decline in CO₂ emissions, translating into health benefits.

The main adaptation and low-carbon policies identified are summarized in the table below, along with their associated costs and benefits.

Table 6.1. The costs and benefits of adaptation and low-carbon development policies

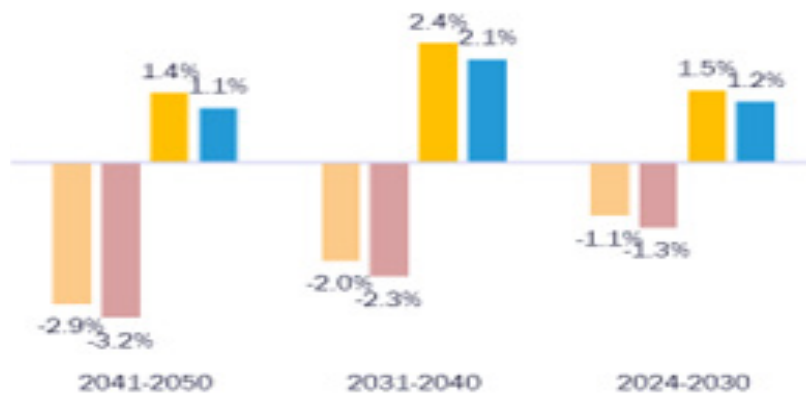
Sector	Key Policies	Costs		Benefits
		2024-2030	2024-2050	
Agriculture	Higher irrigated area, use of climate-resistant crops, use of climate-smart practices, mechanization.	103.0	244.6	Higher agricultural productivity
Water	Higher desalination capacity.	14.4	71.0	Increased water availability
Tourism	Diversification of the tourism offer, improved sustainability, communication, governance and skill development.	96.5	254.1	Offsetting of “sea and sun” tourism losses by “nature and culture” tourism gains
Fisheries	Monitoring and management of fish stock, communication, enforcement.	5.2	13.7	Offset losses in landed value and income
Coastal Protection	Risk-informed planning and regulations.	32.4	85.7	Avoided disaster risk damage
Risk Prevention	Improved early warning systems	11.9	31.5	Avoided disaster risk damage
Roads	New and climate-resilient roads.	12.5	22.1	Slower depreciation of road capital
Total for adaptation policies		275.9	722.6	
Power	Net zero in the sector (cost-effective solution), relative to baseline.	154.0	405.2	Lower fuel imports and air pollution
	Total green investment	416.7	1,281.1	
Transport	Rapid substitution of ICEs by EVs, relative to baseline	87.5	148.7	Lower fuel imports and air pollution
	Total investment	126.5	485.4	
Waste	Improved waste management practices	24.2	103.9	Lower methane emissions
Total for low-carbon development policies		567.4	1,870.4	
Total climate action spending		842.3	2,593.0	

Note: All amounts are in 2023 US\$, discounted at a 6 percent annual rate.

6.2. Ambitious climate action would support growth and yield significant benefits

Overall, ambitious climate action would more than offset the effects of climate change on GDP. In Cabo Verde’s CC-MFMod, a climate action scenario is implemented, integrating the investments listed in the previous section, while modeling the associated benefits, enabling the assessment of the macroeconomic effects of ambitious climate action. In the absence of climate action, Cabo Verde’s GDP in 2050 is expected to be 3.0 percent and 3.5 percent lower than under the baseline scenario, in the wet/warm and hot/dry scenarios, respectively. In the climate action scenario, GDP is expected to be 1.6 percent and 0.9 percent higher than baseline, respectively (figure 6.1). Given the climate investment profile, the spending stimulus effect on GDP would peak in 2035.

Figure 6.1. Percentage change in average annual GDP over three successive decades under two climate scenarios, relative to baseline



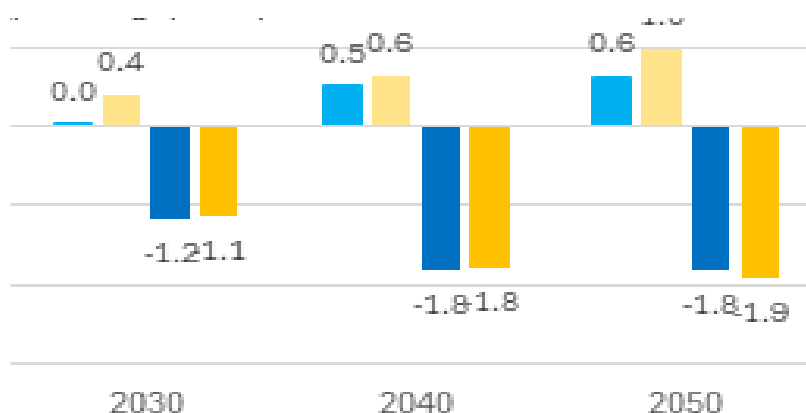
Source: Original compilation

Note: The pessimistic scenario refers to a hot and dry climate future; the optimistic scenario refers to a wet and warm climate future.

The benefits from climate action on Cabo Verde's economy would come primarily from higher tourism and agricultural output, together with an improved trade balance. In both climate scenarios, tourism revenues are about 10 percent lower by 2050 but, in the climate action scenario, ambitious adaptation policies offset about half of the loss in arrivals, and revenues are only 4.1 percent lower than the baseline in 2050. Meanwhile, large investments in the agricultural sector boost agricultural productivity and output. This results in higher tourism exports and lower imports, raising net exports' contribution to growth.

6.3. Climate action would reduce the social costs of climate change for Cabo Verdeans

Figure 6.2. Difference in the incidence of poverty over three successive decades under two climate scenarios, relative to baseline



Source: Original compilation based on IDRF-III microdata, CC-MFMOD, and biophysical damage function (Industrial Economics Incorporated, *Estimating the Economic Damages of Climate Change in Cabo Verde*, unpublished report (Cambridge, Massachusetts: IEc (2024))

Note: The figure reports the difference between two climate-adaptation scenarios with respect to the baseline. Negative values indicate lower poverty than baseline. Poverty estimates reflect disaggregated effects per location and sector, and indirect effects. The optimistic scenario refers to a wet and warm climate future.

Climate adaptation and mitigation policies would bring substantial social benefits. Figure 6.2 measures how much the increase in poverty is ameliorated when climate policies are pursued. Three conclusions emerge from this analysis. *First*, the impact of climate action is relatively similar across different climate scenarios, suggesting that its beneficial effects on productivity and growth are independent of changes in climate patterns. *Second*, the benefits of climate action compound over time, peaking in 2050 when the poverty headcount declines by up to 1.9 percentage points over baseline. *Third*, the benefits from climate action are substantial, with the result that the poverty rate is almost 2 percentage points lower every year after 2040. Additionally, climate action investments are expected to reduce the poverty gap, which will help to improve the livelihoods of Cabo Verdeans who are expected to be poor in 2050.

By 2050, it is projected that, because of climate investments, the poverty gap will decrease between 11.5 and 13.1 percent compared to the baseline scenario. This improvement underscores the fact that climate action is warranted not only for its positive impact on economic growth but also for its significant benefits to the livelihoods of the poorest. It also shows emphatically that adaptation policies aimed at the most vulnerable are justified, even if they have a minimal effect on overall economic growth. For example, enhancing the social protection system could be an important policy for protecting the poorest households from the impacts of climate change.¹¹⁶ Even though it may not substantially mitigate the immediate economic impacts of climate change on GDP, it can play a crucial role in safeguarding the poorest households from its adverse effects.

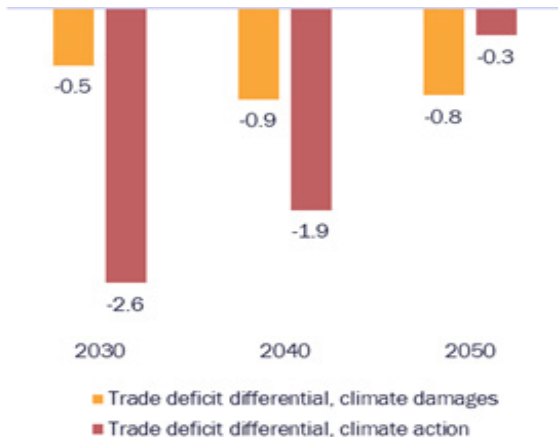
The effects of climate action will differ from island to island, calling for adaptive social policies. In the tourism sector, more vigorous development of “nature and culture” tourism than that of “beach and sun” tourism imply some degree of redistribution of tourism activity across the islands—possibly benefiting Santo Antão and Santiago. In the agricultural sector, the increase in irrigated areas would likely benefit Santiago, Santo Antao, Fogo and São Nicolau, while the benefits of yield-enhancing policies would mirror the existing balance of agricultural production. Meanwhile, investment in coastal protection and early-warning systems would accrue to the populations most exposed to sea-level rise and flooding (see section 3.4).

6.4 External and fiscal pressures increase in the climate action scenario

Climate action would initially increase import needs, but in the long term, it would reduce external financing needs, by reducing tourism losses and dependence on imports. Higher tourism sector resilience would limit the expected decline in exports. Meanwhile, significant investment needs would stimulate equipment imports in the short term, but gradually, the green transition in transport and power would greatly reduce fuel import needs (15 percent of 2023 imports), while surging agricultural output would curb food imports (29 percent of 2023 imports), compounded in the long term by easing investment-induced capital import needs. In all, external financing needs would decline by 2050, alleviating Cabo Verde’s reliance on external financing.

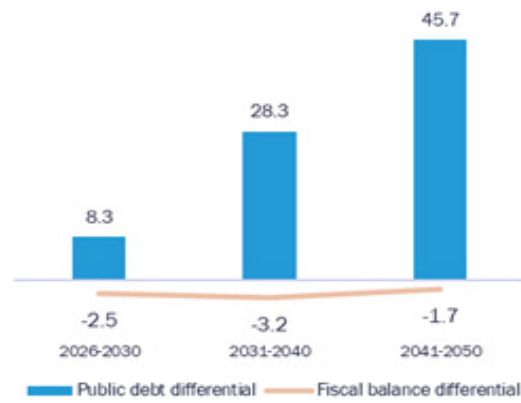
Climate action would exert pressure on public finance which, given the high public debt, requires mobilizing additional tax revenues and maximizing private sector investments. In the climate action scenario, 46 percent of cumulative adaptation and low-carbon development spending between 2024 and 2050 would come from the public sector, given the limited scope for private sector financing in some sectors (see section 6.5). Assuming that the resulting deficits are financed entirely by public debt, it would generate a 50 pp GDP increase in the public debt by 2050, relative to the baseline scenario. This would exert significant pressure on fiscal balances and affect Cabo Verde’s borrowing costs and ability.¹¹⁷

Figure 6.3. Climate action would increase external financing needs initially, but improve the trade balance in the long run



Source: Original compilation.

Figure 6.4. Climate action financing through debt-financed fiscal deficits would increase fiscal pressure



Source: Original compilation

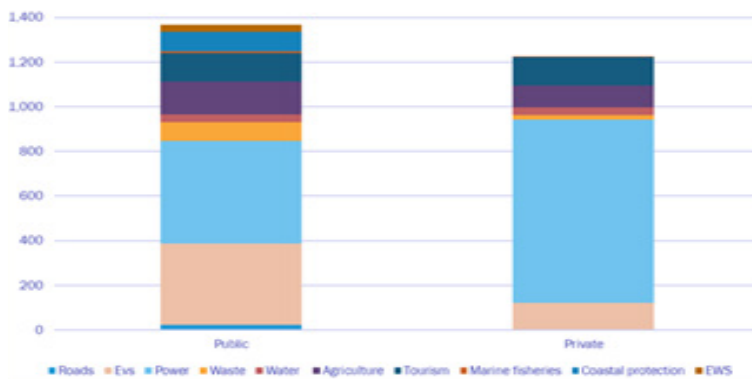
Note: Average differentials, in percentage points of GDP. Average of climate scenarios.

6.5. Financing the transition

6.5.1. Leveraging public and private financing

In light of existing fiscal constraints, ambitious and cross-cutting climate action policies need to be complemented by a multi-faceted public and private financing strategy. Over the 2024–2050 period, investment needs will amount to US\$2.593 billion, which represent 7.1 percent of cumulative GDP over the same period.¹¹⁸ About 48 percent would come from public sources, which would public spending by about 10 percent a year, highlighting the need for greater domestic resource mobilization.¹¹⁹ About 52 percent would come from private sources, highlighting the need to maximize corporate investments amid declining access to concessional financing¹²⁰ and binding fiscal constraints.

Figure 6.5. Estimated climate action spending, 2024–2050, by sector



Source: Original compilation

Note: In the power sector, total green spending was considered. For all others, only the change vs. baseline.

Although generating fiscal space for climate action remains a priority, opportunities to maximize private sector participation should be sought. In several areas—for example, roads, waste management, and coastal protection—public spending will have to remain the main or only source of finance. Generating fiscal space for climate spending therefore remains a priority. In other sectors—such as energy, agriculture or tourism—participation could provide significant financing in support of the transition. Drawing on the sectoral recommendations presented in sections 3.5 and 4.5, table 6.2 presents a selection of areas with potential for private sector participation.

Public sector policies and investments are vital for unlocking private sector investments. The private sector has a central role to play in mobilizing finance for climate mitigation and adaptation, both through its own resources, and by channeling funding through other instruments. Through innovative financing mechanisms and partnerships, such as PPP and blended finance models, businesses amplify the impact of public funds by attracting additional private investment. To unlock private financing, targeted policies are needed. In the tourism sector, they can take the form of infrastructure investments in cultural and natural sites, along with promotional efforts. In the energy sector, the ongoing restructuring of the state-owned electric utility, Electra, and other targeted reforms should stimulate appetite for private investment into green energy projects.¹²¹

Table 6.2. Share of public sector financing, by sector, and opportunities for private sector participation

Sector	Public sector financing share (%)	Where the private sector could participate
Agriculture	60	Development of CSA practices, including use of heat-tolerant varieties, intercropping, and organic fertilizers. Promotion of diversification toward horticulture and fruits. Development of early-warning systems and agriculture insurance
Forestry	N/A	Integrating forest management with agriculture and tourism. Supporting community-led afforestation and reforestation.
Water	50	Reduction of water network losses and use of digital technologies for water efficiency
Tourism	50	Diversifying the offer from “beach & sun” to “nature and culture” (hiking, yachting, cultural, creative, and so on), support for auto-adaptation of private sector along the shoreline, reduction of tourism footprint on natural resources (water, waste, land)
Fisheries	70	Researching and monitoring of fish stock, development of aquaculture, including seaweed and shellfish
Coastal protection	100	Limited
Risk prevention	100	Limited
Roads	100	Limited
Power	36	Grid modernization, storage capacity investments, raising renewable energy penetration and innovation, and skill development
EVs	75	Achieving e-mobility targets for the public fleet and public charging infrastructure
Waste	80	Deployment of integrated waste management systems, engineered landfills investment, and recycling expansion

The financial sector can play a central role in effectively mobilizing resources for climate investments and mitigating risks. The public and private sectors will need to use various financial instruments and strategies, such as fiscal incentives, green bonds, and PPPs to mobilize enough climate finance and safeguard the stability of the financial ecosystem. However, the financial sector’s capacity for channeling climate investments depends on its ability to address structural challenges, including diversifying the sector, since the sector’s long-term financing is limited by the small number of market players and a preference for holding securities to maturity. Mobilizing additional liquidity sources will also support climate investments, for instance, through greater mobilization of remittances, which in 2023 represented 10.6 percent of GDP. The development of catastrophe insurance products could also potentially play a larger role in taking on some of the risk from extreme climate shocks.

6.5.2. Creating fiscal space for green spending

For incompressible public climate action spending, tax reform and external grants rather than to public debt would yield economic and fiscal benefits:

- 1) Debt financing would raise principal and interest liabilities, increasing the debt-to-GDP ratio by 50 pp of GDP by 2050, relative to the baseline. In turn, high and rising public debt could increase the risk premium and cost of credit in Cabo Verde, with adverse effects on GDP growth.
- 2) Domestic resource mobilization, for instance, through higher indirect taxes on consumption (such as VAT), could generate a moderate increase in domestic prices. Yet it would only translate into a modest increase in public debt (+11 pp), with limited adverse effects on growth.
- 3) External development grants, from green funds or from philanthropic organizations, would not affect growth or the debt ratio, yet would generate foreign exchange revenue.

In all, the financing of climate action through public debt accumulation could be costly. Although external development grants are a low-cost alternative, they are unlikely to cover all of Cabo Verde’s public climate action spending, and they lack predictability. As a result, the country may want to maximize external development grants wherever possible but should strengthen domestic resource mobilization to promote the predictable and sustainable financing of climate action spending.

To enhance domestic resource mobilization, Cabo Verde authorities are looking to green taxation policy to generate additional resources for investment. The policy, which will be implemented in a phased manner, aims to collect revenue on all uses of goods and services that influence CO2 emissions. The first phase consists of the implementation of a levy on international air and maritime transport levy, which is expected to yield additional revenue of about 0.5 percent of GDP. This, along with reforms linked to indirect taxes—and especially excises—could contribute to meeting part of the fiscal financing gap. A carbon pricing policy could also incentivize the climate transition, while generating additional revenues—although a significant share of those would need to be recycled to mitigate the policy’s implications, and used to compensate affected households (see box 6.1).



Box 6.1. Ensuring the success of a carbon pricing policy

A modest carbon tax would support mitigation of emissions growth with substantial revenue-generating potential. The World Bank–IMF Climate Policy Assessment Tool (CPAT) can uncover the effects of the introduction of various carbon pricing and non-carbon pricing policies in Cabo Verde, as well as their environmental and socioeconomic impacts. An IMF analysis using the CPAT calibrated for Cabo Verde suggests that a carbon tax at US\$10/tCO₂e in 2024, increasing to US\$35 by 2035, would lead to a 6 percent reduction in GHG emissions by 2030 relative to a baseline. The power sector would be the primary contributor to these reductions, considering its reliance on fossil fuels. Additionally, the tax would generate fiscal revenues reaching 1 percent of GDP by 2035, or a cumulative US\$280 million by 2035.

Revenue recycling measures would be needed to mitigate potential growth and price impacts. While the carbon tax would have modest negative impacts on growth, it could be mitigated through strategic revenue recycling. The tax would result in higher energy prices, particularly affecting diesel and electricity prices. It would raise output prices, especially in the aviation and shipping sectors, with ripple effects in the service and food sectors, which are central to Cabo Verde’s service-oriented, import-dependent economy.

Households would be adversely affected unless revenues are used for targeted cash transfers and public investment. To meet NDC targets and ensure public acceptance, the government should consider developing revenue recycling policies to offset growth and social impacts, together with a comprehensive communication strategy. A progressive tax design could lessen the burden on lower-income individuals, while the communication strategy would articulate the benefits of carbon pricing and be transparent about the use of additional revenues.

6.5.3. Innovative climate financing tools could leverage vital resources

Cabo Verde’s declining access to concessional financing and prudent borrowing practices mean that it needs to leverage resources strategically. Most climate finance flows into Cabo Verde originate from multilateral development banks, which hold more than half of the country’s external public debt. The main creditors are the IMF, the African Development Bank, and the World Bank. Bilateral lenders, led by Portugal, account for about a fifth of the external debt, while commercial investors have a smaller share.¹²² Cabo Verde also benefits from multilateral climate funds, such as the Green Climate Fund, the Adaptation Fund, the Climate Investment Funds, and the Global Environment Facility. However, the country’s access to concessional financing declined after it became a middle-income country. In addition, in light of its high public debt vulnerabilities, the government has committed to prudent borrowing practices. This includes the implementation of a zero ceiling on non-concessional borrowing and a ceiling on the present value of new external debt—both supported under the ongoing IMF Extended Credit Facility program—which limit access to additional external financing.

Use of concessional financing

Until Cabo Verde can access market or semi-concessional financing again, scarce concessional resources need to be used strategically to leverage private capital for climate action. For instance, concessional financing could be used to derisk projects and attract private investments, as in the case of the Development Bank of Rwanda’s 2023 credit-enhanced sustainability-linked bond issuance. To enhance the credibility of its bond, the bank funded an escrow account of US\$10 million to be used as collateral in the event of a default and to be invested into risk-free Rwandan government bonds to reduce the overall cost of borrowing.¹²³

Cabo Verde is a good candidate for debt-for-development swaps, despite the high transaction costs. Debt-for-development swaps can reduce debt obligations and channel the savings toward specific climate and nature

purposes. Debt swaps with multilateral, bilateral, and private creditors would generate benefits, but they would need to overcome the challenges of high transaction costs, coordination among stakeholders, and good capacity in debt management and project monitoring and evaluation. In 2023, Cabo Verde signed a memorandum of understanding (MoU)¹²⁴ with Portugal to swap part of its debt for investments in a Climate and Nature Fund that could leverage resources from various sources and support Cabo Verde's priorities in sustainable tourism, the blue economy, the digital economy, and renewable energy. The experience of other countries, such as Seychelles, Rwanda, Mozambique, and Namibia, could provide valuable lessons. For instance, the Rwanda Green Fund has mobilized private sector climate finance through a credit-enhanced sustainability-linked bond issuance.¹²⁵

Market-based instruments for climate finance are emerging

Cabo Verde has made significant progress in using market-based instruments for climate finance, especially in the blue economy sector. There is significant sustainable finance activity, with the issuance of several sustainable bonds by domestic corporates, including utilities, private financial groups, and a consortium of municipalities; the creation of a dedicated listing platform on the stock exchange that would include green, social, blue, and sustainable bonds; and the publication of a set of regulations by the Securities Market Audit Office—*Auditoria Geral do Mercado de Valores Mobiliários* (AGMVM)—that discipline the issuance process of green, blue, and social bonds, as well as establish a taxonomy of projects that can be considered eligible for blue bonds. Those capacities will undoubtedly prove useful once the country can access international capital markets.

The Blu-X platform will facilitate investments in sustainable projects, particularly those focused on the blue economy, and support Cabo Verde's integration with regional and international markets. Blu-X was established in 2012 within the Cabo Verde Stock Exchange—*Bolsa de Valores de Cabo Verde* (BVC)—as a unified regional platform for listing and trading sustainable finance instruments. The Blu-X website lists seven sectors that are eligible for financing through proceeds of instruments listed on the platform—tourism, digital economy, agribusiness, the blue economy, renewable energy, health, and light industry. It also provides an upgraded digital trading infrastructure to facilitate domestic and foreign investments. The first blue bond issuance on the platform was by the Cabo Verdean International Investment Bank in January 2023.¹²⁶ As of December 2023, six sustainable bonds totaling EUR 35 million had been listed on the platform, including blue, social, and sustainable bond issuances by public and private entities.¹²⁷

Sustainability-linked financing could mobilize concessional flows and capital resources

Once financing constraints ease, Cabo Verde could consider issuing a sustainability-linked bond or loan to leverage concessional resources and mobilize capital flows from investors committed to sustainable finance markets. Sustainability-linked bonds and loans are a type of financing that rewards or penalizes the borrower based on their performance as measured against predefined sustainability goals. These goals are linked to key performance indicators (KPIs)¹²⁸ that reflect the borrower's sustainability strategy and objectives. Exceeding the sustainable performance thresholds can result in the lowering of the coupon, hence reducing the cost of funding for those issuers that demonstrate outstanding sustainability performance. Conversely, the lack of progress toward the KPIs can increase the instrument's coupon.¹²⁹ These instruments can also be combined with other credit enhancement mechanisms to optimize and lower the cost of financing. Examples of this include Rwanda's 2023 SLB, which with a one-third credit enhancement from an IDA loan managed to reach institutional investors that have a limited risk appetite, and Uruguay's 2022 symmetric, sustainability-linked bond (SLB).¹³⁰

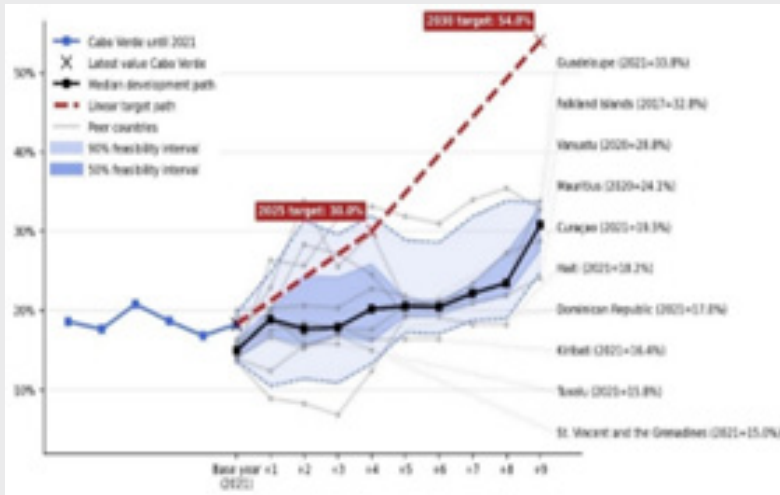
The viability of sustainability-linked funding instruments rests on Cabo Verde's credibility in achieving sustainability targets. Sustainability goals can be based on existing climate and nature policies and commitments, provided the country has measurable, verifiable data. Targets could include the decarbonization of the electricity sector,¹³¹ with the targets set in the 2018–2040 Master Plan of the Power Sector¹³² or the ambitious targets in the management and conservation of natural resources—such as the Global Ocean Alliance pledge to protect at least 30 percent of the ocean by 2030.¹³³

Box 6.2. A potential sustainability-linked framework KPI: How ambitious are Cabo Verde's renewable energy targets?

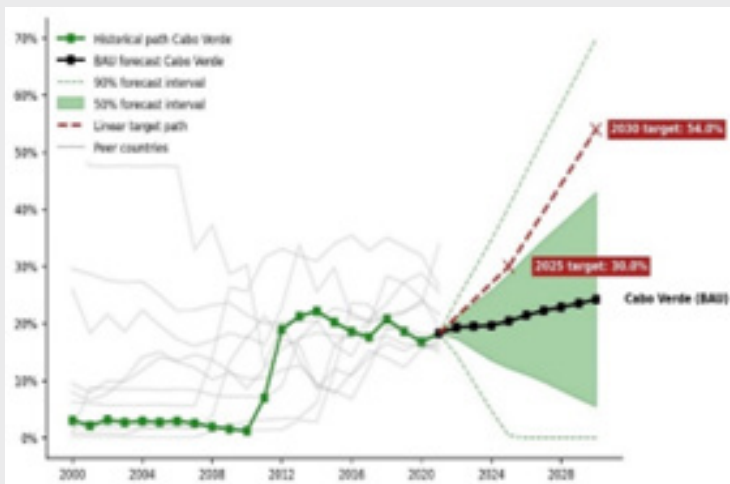
The principles of the International Capital Markets Association (ICMA) and market best practices require sustainability-linked instruments to have material and core indicators with ambitious and verifiable performance targets, such as on renewable energy penetration. Cabo Verde's First Updated NDC of 2020 commits to increasing the share of RE in the electricity supply from 18.4 percent in 2020 to 54 percent in 2030 and 100 percent by 2040, with adequate support. The corresponding strategy is crucial to give credibility to the targets—in this case, a combination of new RE installations and energy storage systems.

The decarbonization targets are indeed very ambitious, considering the experience of peer countries with similar levels of RE development and when assessed against the country's trajectory, as well as against a set of peer island countries. Based on a business-as-usual scenario, the ambition of Cabo Verde's decarbonization strategy increases over time, with the 30 percent by 2025 target slightly above the forecasted trend, and the 54 percent by 2030 target significantly outside the estimated BAU trend.

Feasibility of Cabo Verde's RE penetration target with respect to peers



The ambitiousness of Cabo Verde's RE penetration target with respect to its own trajectory



Other outcome-based bonds

Outcome-based bonds, also known as impact bonds, are a financial tool designed to fund projects that have specific, measurable, climate-related outcomes. Investors provide upfront capital for initiatives like reducing carbon emissions or reforestation. The success of these projects is measured against predefined metrics, and investors receive returns based on the achievement of the goals. For instance, the Amazon Reforestation-Linked Bond, recently issued by the World Bank,¹³⁴ rewards investors based on the generation of Carbon Removal Units from reforestation efforts. Other examples are the World Bank’s Wildlife Conservation Bond in 2022 and the Emission Reduction Linked bond in 2023. The return to investors is based on the outcome of the project—either through the receipt of an outcome payment from a donor upon the success of the project, or the returns from assets such as carbon credits generated through the project. This approach not only finances crucial climate initiatives but also incentivizes successful outcomes by transferring performance risk to investors.

6.6. Policy options for financing the transition

Table 6.3. Policy options for financing climate action

Sector	Action	Priority/Timeline	Key Barriers	Lead Actors	Indicators
High-level Objective 2: Mobilize climate finance					
Fiscal	Bring down public debt levels sustainably	Priority: High Timeline: Long term	Structural: Vulnerability to external and climate shocks	Ministry of Finance	Public debt to GDP ratio
Fiscal	Improve tax revenue collection while supporting the climate transition	Priority: High Timeline: Long term	Political economy: Increasing the tax burden could lead to resistance	Ministry of Finance	Tax to GDP ratio
Fiscal	Channel public spending into climate investments or investments that can crowd in private sector investments	Priority: High Timeline: Long term	Institutional readiness: Poor ability to identify and develop a pipeline of climate-tagged projects	Ministry of Finance	Share of public investments that are climate-tagged
Financial	Stimulate diversification in the financial sector	Priority: Medium Timeline: Long term		BVC	
Financial	Strengthen the existing infrastructure for the market-based financing of climate investments	Priority: Medium Timeline: Long term		BVC	
Financial	Identify sustainability targets that could be candidates for SLBs or for sustainability-linked loans (SLLs)	Priority: Medium Timeline: Long term		BVC	

Note: Barriers are classified as (1) affordability, (2) financing, (3) political economy, (4) institutional readiness, (5) structural, or (6) market.



7. Conclusion

Cabo Verde lies at a critical juncture where ambitious climate action could significantly alter its social and economic trajectory. The country's strategic geographic position, coupled with its potential for renewable energy, offers a unique opportunity to become a hub for digital services, the blue economy, and sustainable growth. However, the challenges posed by climate change are substantial and impact key sectors such as tourism, agriculture, and fisheries.

This CCDR demonstrates that ambitious climate action would more than offset the negative effects of climate change on GDP and boost growth. The climate action scenario modeled for this CCDR shows that, in the absence of climate action, Cabo Verde's GDP is expected to be up to 3.6 percent lower in 2050. In the climate action scenario, GDP would be up to 1.0 percent higher compared to the baseline scenario.

The benefits of climate action on Cabo Verde's economy would come primarily from higher tourism, higher agricultural output, and high aggregate investment. In the climate action scenario modeled, ambitious adaptation policies offset about half of the loss of international tourism arrivals by 2050. Large investments in the agricultural sector will boost agricultural productivity, and adaptation to climate shocks would lessen their damage. Combined with ambitious green energy and transport policies, large adaptation investments would support growth. The poverty headcount could be up to 1.9 pp lower than in the baseline because of climate action.

To realize this future, the CCDR proposes policy reforms and investments in several prime sectors such as the green and blue economies, infrastructure systems, the energy transition, green transport, and digital services. Building resilience at the firm and household levels, developing green skills, and structuring adaptive health systems will also be essential to promote inclusive growth, including gender equality outcomes. In addition, strengthening the institutional and legal framework will be needed to create an enabling environment.

In the context of current fiscal constraints, ambitious and cross-cutting climate action policies will need to be complemented by a multifaceted public and private financing strategy. An ambitious, cross-sectoral, comprehensive climate action scenario would require substantial investment, totaling US\$842 million over 2024–2030, or US\$140 million per year, which represents 6 percent of cumulative GDP over the same period.¹³⁵ Over the 2024–2050 period, investment needs amount to US\$2.593 billion—7.1 percent of cumulative GDP over the same period. About 48 percent of this would come from public sources, which would require an increase in annual public spending of about 10 percent. This indicates the need for greater domestic resource mobilization. The other 52 percent or thereabouts would come from private sources, which points to the need to maximize corporate investments, considering Cabo Verde's declining access to concessional financing and its fiscal constraints.

Generating fiscal space for climate spending therefore needs to remain a priority. Unlocking private sector investments will require the right public sector policies and investments, in addition to strengthening the financial sector to enhance its ability to channel resources toward climate investments.

Cabo Verde's private sector has a central role to play in mobilizing climate finance, particularly through innovative financing mechanisms and partnerships. To encourage resilient, higher-value-added growth while promoting sustainable practices, opportunities exist to unlock private investment in high-growth sectors such as fishery, the circular economy, renewable energy, digital services, and in particular, tourism that goes beyond the traditional sun-and-sea offering. Because of its fragmented geography and the long distances between production sites and consumers, Cabo Verde's economy needs efficient air and maritime transportation infrastructure and logistics services. Addressing the need for greater inter-island maritime and air connectivity represents a substantial opportunity for private investment. Additionally, Cabo Verde's strategic geographic position at the crossroads of international fiber-optic submarine cables gives it a comparative advantage in connecting African, European, and South American countries with one another and underscores its potential as a regional hub for digital services.

In conclusion, early and ambitious climate action in Cabo Verde could reverse the negative impacts of climate change and boost sustainable, inclusive growth. By leveraging its strategic position and enhancing resilience across sectors, businesses, and people, Cabo Verde can realize a productive and sustainable future.

Table 7.1. High-level objectives and a snapshot of key recommendations

HL01	Build a robust, climate-resilient legal and institutional framework to achieve national climate goals
★ 1.1	Enact a new climate change law and align local legislation with national climate objectives.
1.2	Develop a robust legal and institutional framework, enhance capacity and public engagement, integrate climate obligations, strengthen enforcement, and include climate in the ESIA framework.
1.3	Strengthen the legal framework for carbon markets.
HL02	Mobilize climate finance
★ 2.1	Sustainably bring down public debt levels, create fiscal space, and channel public spending to crowd in private sector investment.
2.2	Maximize corporate investments, particularly in tourism, digital services, and energy. Diversify the financial sector.
2.3	Scale up the existing infrastructure for the market-based financing of climate investments.
HL03	Adopt integrated land and water management
★ 3.1	Safeguard freshwater resources, reduce losses and invest in low-carbon desalination and wastewater reuse.
3.2	Promote CSA practices, irrigation, and agriculture diversification.
3.3	Integrate forest management with agriculture and tourism, support community-led afforestation and reforestation.
HL04	Create a climate-resilient blue economy (tourism, fishery, ocean)
★ 4.1	Support the research and monitoring of fish stock.
4.2	Promote sustainable fishery through regulations, no-fish zones for regeneration, sectoral standards, and formal certification for processed fish, while increasing aquaculture.
★ 4.3	Diversify the tourism offer from “beach and sun” to hiking, yachting, and cultural and creative activities, and reduce the footprint of the tourism sector. Protect coastal ecosystems and promote adaptation in the private sector.
HL05	Build more climate-resilient and inclusive infrastructure systems
★ 5.1	Develop risk-informed, national infrastructure planning; update building regulations for new infrastructure.
5.2	Upgrade existing connectivity infrastructure, and implement risk-informed, transport asset management.
5.3	Strengthen inter-island connectivity.
5.4	Build up the climate resilience of digital infrastructure; enhance climate monitoring and ICT services.
HL06	Advance the green transition in the energy, transport and waste sectors
★ 6.1	Increase RE penetration, modernize the grid, and invest in storage capacity.
6.2	Complete sector demerger and privatization, build institutional capacity, and advance on regulation incentives.
★ 6.3	Mobilize private funds through project pipeline development, transaction advisory support, the derisking of facilities, and procurement strategies to aggregate small projects into larger ones.
6.4	Achieve e-mobility targets on public fleet and public charging infrastructure and deploy supportive policies and regulations for private e-mobility.
6.5	Deploy integrated waste management systems, invest in engineered landfills, and expand recycling. Promote separation at source.
6.6	Improve waste management regulations and financing, including the tariff system, and leverage partnerships between public sector, private sector, and third sector.
HL07	Support households and firms to build climate resilience
7.1	Enhance the social protection system’s efficiency, coordination, and responsiveness to climate-related shocks by strengthening the social registry, the cash transfer program, and early -warning systems.
★ 7.2	Build skills in high-value green sectors by integrating climate issues into school curricula, expand. Expand vocational training, and introduce learning programprograms that support green entrepreneurship, with a special focus on womanwomen and youth.
★ 7.3	Expand disease surveillance and early -warning systems to include climate-sensitive diseases.
★ 7.4	Enhance MSMEs’ access to climate financeto Micro Small Medium Enterprises, promote economic diversification, and integrate climate considerations into PPP projects.

Note: ★ = Urgent

Bibliography

African Development Bank. *Country Focus Report 2023 – Cabo Verde: Mobilizing Private Sector Financing for Climate and Green Growth.* Abidjan, Côte d'Ivoire: AfDB, 2023.

<https://www.afdb.org/en/documents/country-focus-report-2023-cabo-verde-mobilizing-private-sector-financing-climate-and-green-growth>.

Banco de Cabo Verde. *External Sector Database.* Last accessed December 21, 2024. <https://www.bcv.cv>.

Bernasconi, Luca. DGASP (MAA), Cabo Verde Land Cover Maps, 2009.

Burns, Andrew, Benoit Philippe Marcel Campagne, Charl Jooste, David Andrew Stephan, and Thi Thanh Bui. “The World Bank Macro-Fiscal Model Technical Description.” Policy Research Working Paper no. 8965. Washington, DC: World Bank, 2019.

<http://documents.worldbank.org/curated/en/294311565103938951/The-World-Bank-Macro-Fiscal-Model-Technical-Description>.

Burns, Andrew, Charl Jooste, and Gregor Schwerhoff. “Climate-modeling for macroeconomic policy: A case study for Pakistan.” Policy Research Working Paper. Washington, DC: World Bank, 2021.

<http://documents.worldbank.org/curated/en/747101632403308927/Climate-Modeling-for-Macroeconomic-Policy-A-Case-Study-for-Pakistan>.

Burns, Andrew, Charl Jooste, and Gregor Schwerhoff. “Macroeconomic Modeling of Managing Hurricane Damage in the Caribbean: The Case of Jamaica.” Policy Research Working Paper no. 9505. Washington, DC: World Bank, 2021. <https://hdl.handle.net/10986/34982>.

Campos Garcia, Ana, and Keiko Sakoda. *Building Regulations in Sub-Saharan Africa: A Status Review of the Building Regulatory Environment.* Washington DC: World Bank, 2023.

<https://documents1.worldbank.org/curated/en/099052523132014390/pdf/P1508350b1503303c097220fedae9a523b9.pdf>.

Doan, Miki Khanh, Ruth Hill, Stéphane Hallegatte, Paul Andres Corral Rodas, Ben James Brunckhorst, Minh Nguyen, Samuel Freije-Rodriguez, and Esther G. Naikal. *Counting People Exposed to, Vulnerable to, or at High Risk from Climate Shocks—A Methodology.* Washington DC: World Bank, 2023.

<http://documents.worldbank.org/curated/en/099602511292336760/IDU07639ca570f3cb048db09bf60fc2cc82df22d>.

Esch, Thomas, Elisabeth Brzoska, Stephan Dech, Benjamin Leutner, Daniela Palacios-Lopez, Annekatrin Metz-Marconcini, Mattia Marconcini, Achim Roth, and Julian Zeidler. “World Settlement Footprint 3D—A first three-dimensional survey of the global building stock.” *Remote Sensing of Environment* no. 270 (March 2022): 112877. <https://doi.org/10.1016/j.rse.2021.112877>.

Fathom. “Global Flood Map.” Last accessed January 11, 2025,

<https://www.fathom.global/product/global-flood-map>.

Food and Agriculture Organization. *World Food and Agriculture—Statistical Yearbook 2023.* Rome: FAO, 2023. <https://doi.org/10.4060/cc8166en>.

Gaines, Steven, Reniel Cabral, Christopher M. Free, and Yimnang Golbuu. *The Expected Impacts of Climate Change on the Ocean Economy*. Washington, DC: World Resources Institute, 2019. <https://www.blueclimateinitiative.org/sites/default/files/2020-06/expected-impacts-climate-change-on-the-ocean-economy.pdf>.

Government of Cabo Verde. “Plano Diretor do Setor Elétrico 2018–2040.” *Boletim Oficial da República de Cabo Verde* I Série, no. 40 (2019). <https://faolex.fao.org/docs/pdf/cvi185115.pdf>.

Hallegatte, Stéphane, Charl Jooste, and Florent Mclsaac. “Modeling the macroeconomic consequences of natural disasters: Capital stock, recovery dynamics, and monetary policy.” *Economic Modelling* 139 (October 2024): 106787. <https://doi.org/10.1016/j.econmod.2024.106787>.

Hallegatte, Stéphane, Jun Rentschler, and Julie Rozenberg. *Adaptation Principles—A Guide for Designing Strategies for Climate Change Adaptation and Resilience*. Washington, DC: World Bank, 2020. <https://hdl.handle.net/10986/34780>.

Industrial Economics Incorporated. *Estimating the Economic Damages of Climate Change in Cabo Verde*. Unpublished report. Cambridge, Massachusetts: IEc, 2024.

Institute for the Oceans and Fisheries, University of British Columbia. “Draft results report: Impact of climate change on fisheries in Cabo Verde.” Unpublished report. 2024.

Integrated Food Security Phase Classification. *Global Standard for Food Security Classification*. Last accessed on December 20, 2024. <https://www.ipcinfo.org>.

Intergovernmental Panel on Climate Change. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. New York: Cambridge University Press, 2013.

International Capital Markets Association. *Sustainability-Linked Bond Principles: Voluntary Process Guidelines*. 2023. <https://www.icmagroup.org/assets/documents/Sustainable-finance/2023-updates/Sustainability-Linked-Bond-Principles-June-2023-220623.pdf>.

International Federation of Red Cross and Red Crescent Societies. *Cabo Verde: Drought, Operation Update No. 2*. Disaster Response Emergency Fund (DREF) No. MDRCV003. Geneva: IFRC, 2022. <https://reliefweb.int/report/cabo-verde/cabo-verde-drought-operation-update-no-2-dref-no-mdrcv003>.

International Monetary Fund. *Cabo Verde: Technical Assistance Report—Climate Policy Diagnostic*. Washington, DC: IMF, 2024.

International Monetary Fund. *Demographic Dividends, Gender Equality, and Economic Growth: The Case of Cabo Verde*. IMF Working Paper. Washington, DC: IMF, 2016.

Kuriakose, Anne T., Rasmus Heltberg, William Wiseman, Cecilia Costella, Rachel Cipryk, and Sabine Cornelius. “Climate-Responsive Social Protection.” *Development Policy Review* 31, no. s2 (November 2013): o19–o34. <https://doi.org/10.1111/dpr.12037>.

Marconcini, Mattia, Annetkatrin Metz-Marconcini, Soner Üreyen, Daniela Palacios-Lopez, Wiebke Hanke, Felix Bachofer, Julian Zeidler, et al. “Outlining where humans live: The World Settlement Footprint 2015,” *Scientific Data* 7, 242 (July 2020): 1–14. <https://doi.org/10.1038/s41597-020-00580-5>.

Ministry of Finance of Uruguay. *Sovereign Sustainability-linked Framework (SSLB)*. Montevideo: Ministry of Finance, 2022.

Pacific Disaster Center. *Cabo Verde municipal risk profiles*. Maui: Pacific Disaster Center, 2022.

Ranger, Nicola Ann, Olivier Mahul, and Irene Monasterolo. *Assessing Financial Risks from Physical Climate Shocks: A Framework for Scenario Generation*. Washington, DC: World Bank, 2022.
<http://documents.worldbank.org/curated/en/760481644944260441/Assessing-Financial-Risks-from-Physical-Climate-Shocks-A-Framework-for-Scenario-Generation>.

Republic of Cabo Verde. *Boletim Oficial series 1*, no. 42. Praia: Government of the Republic of Cabo Verde, 2024.

Republic of Cabo Verde. *Cabo Verde's First Biannual Update Report*. Praia: Government of the Republic of Cabo Verde, 2022.

Republic of Cabo Verde. Decree-Law no. 4/2018, reforming the Territorial Planning Law (LBOTPU), promulgated on July 6, 2018.

Republic of Cabo Verde. *Fourth National Communication and First Biennial Update Report for the Republic of Cabo Verde under the United Nations Framework Convention on Climate Change (UNFCCC)*. Praia: Government of the Republic of Cabo Verde, 2023.

Republic of Cabo Verde. *National Adaptation Plan*. Praia: Government of the Republic of Cabo Verde, 2021.

Republic of Cabo Verde. *Plano Estrategico de Desenvolvimento Sustentavel*. Praia: Government of the Republic of Cabo Verde, 2022.

Republic of Cabo Verde. *Programa de Emergência para a Mitigação da Seca e do Mau Ano Agrícola (PEMSMAA) 2017/2018; Programa de Mitigação e de resiliência à seca em 2019; Programa de Mitigação dos Resultados do Mau Ano Agrícola 2021/2022*. Praia: Government of the Republic of Cabo Verde, 2017 and 2021.

Republic of Cabo Verde. Resolution 39/2019. 2019.

Republic of Cabo Verde. *Strategic Plan for Sustainable Development (PEDS II, 2022-2026)*. Praia: Government of the Republic of Cabo Verde, 2023.

Republic of Cabo Verde. *Update to the first Nationally Determined Contribution (NDC)*. Praia: Government of the Republic of Cabo Verde, 2020.

Republic of Cabo Verde. *Water and Sanitation Services Annual Report (Relatório Annual dos Serviços de Água e Saneamento)*. Praia: Government of the Republic of Cabo Verde, 2018.

Schling, Maja, Roberto Guerrero Compeán, Nicolás Pazos Navarro, Allison Bailey, Katie Arkema, and Mary Ruckelshaus. *The Economic Impact of Sargassum: Evidence from the Mexican Coast*. Washington, DC: Inter-American Development Bank, 2022. <http://dx.doi.org/10.2139/ssrn.5037762>.

Secretariat of the Convention on Biological Diversity and United Nations Development Programme. *Aichi Biodiversity Target 11 Country Dossier: CABO VERDE*. Montreal and New York: SCBD and UNDP, 2021.
<https://www.cbd.int/pa/doc/dossiers/cabo-verde-abt11-country-dossier2021.pdf>.

Soldan, R., A. Gialletti, L. Norlund, A. Bilbao, and J. Macias. *Climate change and climate change impacts on the Cabo Verde Archipelago with a focus on fishery and tourism sectors in a blue economy context.* Cabo Verde: Office of Climate Change, Biodiversity and Environment and the Food and Agricultural Organization, 2023.

United Nations Framework Convention on Climate Change. *Cabo Verde's First Biennial Update Report.* Bonn, Germany: UNFCCC, 2023. https://unfccc.int/sites/default/files/resource/BUR_EN_Digital.pdf.

Vicente, Abraão. "Blue Is the New Green: The Perspective of a Small Island Nation." Commentary, March 22, 2024. *Brookings*.
<https://www.brookings.edu/articles/blue-is-the-new-green-the-perspective-of-a-small-island-nation>.

Wang, Dieter, Kollenda, Philipp, Gurhy, Bryan, and Stewart, Fiona. "Ambitious, yet feasible: Setting FAB targets for sustainable financing instruments." *World Bank Private Sector Development Blog*. July 10, 2023. Washington DC: World Bank, 2023.
<https://blogs.worldbank.org/en/psd/ambitious-yet-feasible-setting-fab-targets-sustainable-financing-instruments>.

World Bank. *Cape Verde Circular Economy and Tourism Assessment.* Washington, DC: World Bank, forthcoming.

World Bank. *Cabo Verde Country Economic Memorandum.* Washington, DC: World Bank, 2021.

World Bank. *Cabo Verde Country Economic Memorandum.* Washington, DC: World Bank, 2022.

World Bank. *Cabo Verde Economic Update: Rebounding from the Crisis – Restoring Fiscal Sustainability and Leveraging the Private Sector for a more Resilient and Sustainable Recovery.* Washington, DC: World Bank, 2021.
<http://documents.worldbank.org/curated/en/510001631216971397/Cabo-Verde-Economic-Update-Rebounding-from-the-Crisis-Restoring-Fiscal-Sustainability-and-Leveraging-the-Private-Sector-for-a-more-Resilient-and-Sustainable-Recovery>.

World Bank. *Circular and Resilient Tourism on Small Islands and in Coastal Destinations: Circular Economy Gap Analysis: Cabo Verde.* Washington, DC: World Bank. Unpublished report, 2023.

World Bank. Climate Change Knowledge Portal: Cape Verde Climate Change Mean Projections. Last accessed December 18, 2024. <https://climateknowledgeportal.worldbank.org/country/cape-verde/climate-data-projections-general>.

World Bank. Climate Toolkits for Infrastructure PPPs. Washington, DC: World Bank, 2022.
<https://hdl.handle.net/10986/37287>.

World Bank. *Creating Markets in Cabo Verde: An Archipelago of Opportunity: Pathways to Foster Sustainable Private Sector-Led Growth.* Country Private Sector Diagnostic. Washington, DC: International Finance Corporation, 2024.
<https://www.ifc.org/content/dam/ifc/doc/2024/cabo-verde-country-private-sector-diagnostic-en.pdf>.

World Bank. *Disaster Risk Profile: Cabo Verde.* Washington, DC: World Bank, 2019.
<http://documents.worldbank.org/curated/en/523961573390033686/Disaster-Risk-Profile-Cabo-Verde>.

World Bank. “Investors Support Amazon Reforestation Through Record Breaking USD 225 Million World Bank Outcome Bond.” Press Release, August 13, 2024.

<https://www.worldbank.org/en/news/press-release/2024/08/13/investors-support-amazon-reforestation-through-record-breaking-usd-225-million-world-bank-outcome-bond>.

World Bank. *Project Appraisal Document Improving Connectivity and Urban Infrastructure in Cabo Verde* (P178644). Washington DC: World Bank, 2023.

World Bank. *Riding the Blue Wave: Applying the Blue Economy Approach to World Bank Operations*. Washington, DC: World Bank, 2021.

<https://documents1.worldbank.org/curated/en/099655003182224941/pdf/P16729802d9ba60170940500fc7f7d02655.pdf>.

World Bank. *Sailing Rough Seas: Accelerating Growth and Fostering Resilience to Climate Change in Cabo Verde*. Country Economic Memorandum. Washington, DC: World Bank, 2023.

<https://documents1.worldbank.org/curated/en/099081423100593303/pdf/P1772680a5607608d0ab1608335945a51dd.pdf>.

World Bank. “World Development Indicators, Variable: Urban Population (% of total, SP.URB.TOTL.IN.ZS).” 2021.

World Bank. “Development Indicators – Urban population (% of total population) – Cabo Verde.” Last accessed January 11, 2025. <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=CV>.

ANNEX 1: MFMod-CC—A Macro-Structural Model for Assessing Climate Change Impacts

Overview: MFMod-CC is an advanced version of the World Bank’s Macro-Fiscal Model (MFMod), designed to evaluate the macroeconomic impacts of climate change. It extends the MFMod framework by incorporating climate-related modules to analyze emissions, pollution, climate damage, and adaptation measures.

MFMod Modeling Approach: MFMod¹³⁶ is a structural, macro-econometric framework with estimated equations, supporting macroeconomic forecasting and policy analysis. It covers key macroeconomic variables such as GDP, consumption, investment, government spending, exports and imports, wages, exchange rates, and monetary and fiscal policies. The model incorporates expectations and policy reactions. Models derived from the framework are estimated on country data using an error correction mechanism that ensures consistency with economic theory in the long run, and the actual behavior of the economy in the short term.

Climate-Change Extension to MFMod (MFMod-CC): Three extensions have been introduced to the MFMod model¹³⁷ to capture impacts from climate change and mitigation policies:

- 1) *Climate Damages Module:* This extension includes links changes in climate conditions to the macroeconomy. For example:
 - Reduced Sectoral Productivity: The impacts of droughts and floods on crop yields, livestock, fisheries, tourism, and hydroelectricity
 - Reduced Labor Productivity: The effects of heat stress and diseases on working hours and labor supply
 - Capital Stock Damage: The impacts of flooding, sea-level rise, hurricanes, and other extreme events on infrastructure and assets
- 2) *Reconstruction and Adaptation Module:* This extension analyzes reconstruction and adaptation investments and financing, modeling their costs and benefits in terms of reduced damage.
- 3) *Energy, Emissions, and Pollution Module:* This extension includes energy as a factor of production, allowing for carbon pricing impacts and tracking CO₂ emissions from fossil fuel combustion and the impacts of local air pollutants on health, such as particulate matter (PM_{2.5}).

Scenario Simulation and Policy Analysis: MFMod-CC simulates the model over a 30- to 40-year horizon under different climate scenarios. Shocks from biophysical models are introduced as changes in key economic variables, such as productivity, labor, and capital stock damage, and, where applicable, alongside associated adaptation, reconstruction, and low-carbon investments. The model projects the economy’s evolution under these climate and policy shocks, capturing dynamic interactions between supply, demand, and price effects.

Endnotes

- 1 Budget rigidities are institutional, legal, contractual, or other constraints that limit the ability of the government to change the size and structure of the public budget, at least in the short term.
- 2 **Water scarcity** is defined by the United Nations as a condition in which a person has less than 1,000 cubic meters of water per year. **Absolute water scarcity** is defined as less than 500 cubic meters.
- 3 World Bank, *Creating Markets in Cabo Verde: An Archipelago of Opportunity: Pathways to Foster Sustainable Private Sector-Led Growth*, Country Private Sector Diagnostic (Washington, DC: International Finance Corporation, 2024), <https://www.ifc.org/content/dam/ifc/doc/2024/cabo-verde-country-private-sector-diagnostic-en.pdf>.
- 4 Republic of Cabo Verde, *Plano Estratégico de Desenvolvimento Sustentavel* (Praia: Government of the Republic of Cabo Verde, 2022).
- 5 World Bank, *Sailing Rough Seas: Accelerating Growth and Fostering Resilience to Climate Change in Cabo Verde*. Country Economic Memorandum (Washington, DC: World Bank, 2023) <https://documents1.worldbank.org/curated/en/099081423100593303/pdf/P1772680a5607608d0ab1608335945a51dd.pdf>
- 6 An Instituto Nacional de Estatística de Cabo Verde 2019 publication.
- 7 World Bank, *Cabo Verde: Country Economic Update* (Washington, DC: World Bank, 2021).
- 8 World Bank, *Sailing Rough Seas*
- 9 The dry and hot scenarios are selected around the 10th percentile of mean precipitation changes (that is, dry) and the 90th percentile in mean temperature changes (that is, hot), across SSP2-4.5 and SSP3-7.0 global circulation models (GCMs). The wet and warm scenarios are selected around the 90th percentile of mean precipitation changes (that is, wet) and the 10th percentile in mean temperature changes (that is, warm), across SSP2-4.5 and SSP3-7.0 GCMs.
- 10 Impacts modeled on the tourism sector consider only the impact of increased heat on demand, but other factors such as coastal flooding, reduced biodiversity, or frequent extreme climate events could also depress tourism demand.
- 11 The most impacted crops would be sugarcane, bananas, and other tropical fruits, with the latter two accounting for 21 percent of revenues. Yet revenue losses would be larger for vegetables, which account for 46 percent of revenues.
- 12 World Bank, *Sailing Rough Seas*.
- 13 Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York: Cambridge University Press, 2013).
- 14 Combining geospatial data on population and crop area with climate projections for four types of extreme events—heatwaves, droughts, floods, and cyclones—following the approach of M.K. Doan et al., *Counting People Exposed to, Vulnerable to, or at High Risk from Climate Shocks—A Methodology* (Washington DC: World Bank, 2023).
- 15 The exposure to floods defined by Doan et al., *Counting People Exposed to, Vulnerable to, or at High Risk from Climate Shocks* is more conservative than the one used by the World Bank in *Sailing Rough Seas: Accelerating Growth and Fostering Resilience to Climate Change in Cabo Verde*, Country Economic Memorandum (Washington, DC: World Bank, 2023). The former defines exposure using a 90-meter radius with a flood depth of 0.5 meters, while the latter uses a 500-meter radius with a flood depth of 0.3 meters.
- 16 IFRC (International Federation of Red Cross and Red Crescent Societies), *Cabo Verde: Drought, Operation Update No. 2*, Disaster Response Emergency Fund (DREF) No. MDRCV003 (Geneva: IFRC, 2022), <https://reliefweb.int/report/cabo-verde/cabo-verde-drought-operation-update-no-2-dref-no-mdrcv003>.
- 17 About 30 percent of the affected population live outside Santiago, mostly in São Antão, Fogo, São Nicolau, Fogo, and Brava.
- 18 Extreme heat events are not a significant concern in Cabo Verde today, but they could become more troubling if climate conditions worsen.
- 19 Own calculations based on Instituto Nacional de Estatística, *Inquérito às Despesas e Receitas Familiares 2015* (Praia: Instituto Nacional de Estatística de Cabo Verde, 2015).
- 20 Industrial Economics Incorporated (IEc), *Estimating the Economic Damages of Climate Change in Cabo Verde* (Cambridge, Massachusetts: IEc, 2024).
- 21 International Monetary Fund, *Cabo Verde: Technical Assistance Report—Climate Policy Diagnostic*. (Washington, DC: IMF, 2024).
- 22 Republic of Cabo Verde, *Cabo Verdes First Biannual Update Report* (Praia: Government of the Republic of Cabo Verde, 2022).
- 23 The Land Use, Land Use Change, and Forestry (LULUCF) sector in Cabo Verde is unique in its ability to reduce emissions by absorbing CO₂ through forests. In 2019, it offset 58.9 Gg of CO₂. See Republic of Cabo Verde, *Cabo Verdes First Biannual Update Report*.
- 24 Land transport is the largest contributor to transport emissions (64.3 percent), followed by air transport (26.8 percent) and maritime transport (7.4 percent).
- 25 Open-air burning of waste accounted for 50.8 percent, followed by domestic effluent treatment and solid waste disposal.

- 26 Republic of Cabo Verde, *Update to the first Nationally Determined Contribution (NDC)* (Praia: Government of the Republic of Cabo Verde, 2020).
- 27 Republic of Cabo Verde, *Fourth National Communication and First Biennial Update Report for the Republic of Cabo Verde under the United Nations Framework Convention on Climate Change (UNFCCC)* (Praia: Government of the Republic of Cabo Verde, 2023).
- 28 Republic of Cabo Verde, *Strategic Plan for Sustainable Development (PEDS II, 2022-2026)* (Praia: Government of the Republic of Cabo Verde, 2023).
- 29 Republic of Cabo Verde, *Update to the first NDC*.
- 30 It integrates the objectives from the NDC, including, among other things, promoting (i) energy efficiency and conservation in buildings, transport, and industries; (ii) the use of RE to replace fossil fuel-based energy generation; (iii) the transition to low-carbon transport systems, including through electric vehicles, public transport, and non-motorized transport; and (iv) policies and regulations to reduce emissions from industrial processes, cleaner production techniques, and circular economy principles.
- 31 Republic of Cabo Verde, *National Adaptation Plan* (Praia: Government of the Republic of Cabo Verde, 2021).
- 32 A Climate Change Institutional Assessment (CCIA) was conducted to assess the institutional framework for climate action and produce recommendations for effective implementation of climate commitments. Cabo Verde's CCIA assesses (i) Organization (Regulatory Framework, Government Coordination, and Government Capacity); (ii) Planning (Long-Term and Medium-Term Strategies); and (iii) Climate Finance (Public Investment Management and Climate Expenditure). The findings from the CCIA have been used to inform this chapter of the CCDR.
- 33 Republic of Cabo Verde, *Strategic Plan* (PEDS II, 2022-2026).
- 34 Formed by the MOF, Social Development and Inclusion, Territorial Cohesion, Foreign Affairs and Cooperation, Education and science, Health, Tourism and Transport, Ministry of the Sea, the MAA, Water and Energy, and Water and Spatial Planning.
- 35 Composed by a member of the Government responsible for the environment, who shall act as chairman, among others including those responsible for Finance, Territorial Cohesion, Foreign Affairs, Internal Administration, Education, Tourism and Transport, Trade, Industry and Energy, Infrastructure and Spatial Planning, Youth and Sports, The President of the Environment Fund, Environment sector, Agriculture sector, Meteorology sector, National Association of Municipalities of Cape Verde, environmental NGOs, and Consumer Defence Association.
- 36 Republic of Cabo Verde, *Boletim Oficial series 1*, no 42 (Praia: Government of the Republic of Cabo Verde, 2024). Climate action in Cabo Verde has been sectoral or project-driven through international cooperation. The National Framework for Climate Services (NCFS) has been acting as an institutional mechanism to coordinate, facilitate and strengthen collaboration across national institutions but effective and efficient coordination has been a recurring concern in practice.
- 37 A total of 109 indicators were used in this assessment, of which 28 percent are quantitative indicators where data are sourced from publicly available global databases. The ratings for these indicators are assigned according to Cabo Verde's performance as benchmarked against a group of peer countries. For Cabo Verde's A&R assessment, the selected benchmarking group was "Lower-Middle-Income Countries," although the benchmarking exercise was also conducted against "Sub-Saharan Africa" (SSA) countries. The remaining 71 percent of indicators evaluated for the assessment contain qualitative information collected through consultations with sectoral and country experts as well as expert judgement based on review of relevant and publicly available legislative and executive documents, including strategies, regulations, plans and other policy documents.
- 38 Original elaboration. "Estimating the Economic Damage of Climate Change in Cabo Verde." Industrial Economics background paper (unpublished).
- 39 World Bank, Climate Change Knowledge Portal: Cape Verde Climate Change Mean Projections (2021) <https://climateknowledgeportal.worldbank.org/country/cape-verde/climate-data-projections-general>.
- 40 Republic of Cabo Verde, *Update to the first NDC*.
- 41 L. Bernasconi, DGASP (MAA), Cabo Verde Land Cover Maps (2009).
- 42 Abraão Vicente, *Blue Is the New Green: The Perspective of a Small Island Nation*, commentary, March 22, 2024, *Brookings*, <https://www.brookings.edu/articles/blue-is-the-new-green-the-perspective-of-a-small-island-nation>.
- 43 Republic of Cabo Verde, *Update to the first NDC*.
- 44 Integrated Food Security Phase Classification (IPC), Global Standard for Food Security Classification (last accessed December 20, 2024), <https://www.ipcinfo.org>.
- 45 Republic of Cabo Verde, *Update to the first NDC*.
- 46 Republic of Cabo Verde, *Water and Sanitation Services Annual Report (Relatório Annual dos Serviços de Água e Saneamento)* (Praia: Government of the Republic of Cabo Verde, 2018).
- 47 Cabo Verde's desalination plants range from 1,000 – 10,000 (m³/d) in different municipalities of the archipelago. Existing desalination processes use fossil fuel generated electricity, creating financial strain and greenhouse gas emissions. The capacity to produce desalinated water has already reached 43,720 m³/day and is growing due to the increase in demand, especially from the tourism sector.

- 48 The blue economy approach is defined as the sustainable use of ocean resources for economic growth, improved livelihoods, and job creation while preserving the health of ocean ecosystems. Specifically, the blue economy requires that the development of individual oceanic sectors be pursued in an integrated fashion, and with a view to managing their impacts on ocean health. The blue economy aims to align economic development opportunities with ocean health to promote low-carbon, resource-efficient growth that creates jobs and reduces poverty. It recognizes the triple bottom-line objectives of financial, social, and environmental sustainability. This challenge is made even greater by the fact that, contrary to land-based activities, oceanic sectors operate mostly in a public goods setting, where user rights and property rights are not clearly defined, which leads to many instances of the Tragedy of the Commons.” See World Bank, *Riding the Blue Wave: Applying the Blue Economy Approach to World Bank Operations* (Washington, DC: World Bank, 2021), <https://documents1.worldbank.org/curated/en/099655003182224941/pdf/P16729802d9ba60170940500fc7f7d02655.pdf>.
- 49 S. Gaines et al., *The Expected Impacts of Climate Change on the Ocean Economy* (Washington, DC: World Resources Institute, 2019), <https://www.blueclimateinitiative.org/sites/default/files/2020-06/expected-impacts-climate-change-on-the-ocean-economy.pdf>.
- 50 The Ambition Plan 2030 outlines the country’s strategic goals and priorities for sustainable development, and aims to foster economic growth, social inclusion, and environmental sustainability by the year 2030.
- 51 FDI has played a significant role in Cabo Verde’s economy, mostly on the tourism sector. FDI flows contributed to an annual growth rate of 6.8 percent, culminating in the country’s graduation to lower middle-income status in 2007.
- 52 World Bank, *Creating Markets in Cabo Verde*.
- 53 Despite a wealth of natural assets across ten islands, Sal and Boa Vista Islands attract 78 percent of all tourist visits. Including through practices such as sand extraction which contribute to coastal erosion.
- 54 World Bank, *Creating Markets in Cabo Verde*.
- 55 World Bank, *Cape Verde Circular Economy and Tourism Assessment* (Washington, DC: World Bank, forthcoming).
- 56 Desalination of seawater in turn increases fossil fuel-generated energy consumption and requires the disposal of the highly concentrated brine waste stream into the ocean which could be detrimental to marine ecosystems if discharged improperly.
- 58 R. Soldan, A. Gialletti, L. Norlund, A. Bilbao, and J. Macias, *Climate change and climate change impacts on the Cabo Verde Archipelago with a focus on fishery and tourism sectors in a blue economy context* (Cabo Verde: Office of Climate Change, Biodiversity and Environment (OCB) and the Food and Agricultural Organization (FAO), 2023).
- 59 World Bank, *Creating Markets in Cabo Verde*. Transport services represented around 25 percent of greenhouse gas emissions, 27 percent of energy use, and five percent of water use.
- 60 M. Schling et al., *The Economic Impact of Sargassum: Evidence from the Mexican Coast* (Washington, DC: Inter-American Development Bank, 2022), <http://dx.doi.org/10.2139/ssrn.5037762>.
- 61 World Bank, *Creating Markets in Cabo Verde*.
- 62 As per the most recent stock assessment, issued by the International Commission for the Conservation of Atlantic Tunas (ICCAT) in October 2024.
- 63 Institute for the Oceans and Fisheries, University of British Columbia, “Draft results report: Impact of climate change on fisheries in Cabo Verde,” unpublished report (2024).
- 64 Maximum Catch Potential (MCP) in the fisheries sector refers to the largest amount of fish that can be sustainably harvested from a fishery or a specific marine area over a given time frame, typically a year.
- 65 SSP5-8.5 refers to a high-emissions scenario where the world continues on a path of rapid economic growth driven by fossil-fuel-intensive energy systems. It assumes limited policy intervention to reduce emissions, leading to a radiative forcing of 8.5 W/m² by 2100. This scenario represents a worst-case future, with global warming levels projected to reach between 3.2°C and 5.4°C above pre-industrial levels by the end of the century.
- 66 Maximum Revenue Potential (MRP) in the fisheries sector refers to the highest economic revenue that can be generated from fishing activities, assuming optimal harvesting practices, species composition, market conditions, and management. It builds on the biological and ecological concept of sustainable catch limits (typically, Maximum Catch Potential or Maximum Sustainable Yield) but goes further and integrates economic factors like market prices and operational costs.
- 67 These include i) Island Master Plans 2020-2030, which include an inventory of assets still to be effectively leveraged for local tourism development and economic growth, ii) Strategic Tourism Marketing Plan, which guides post-pandemic promotion efforts with a focus on geographical and thematic diversification, and iii) Tourism Operational Plan 2022-2026, which promotes resilient, inclusive, and diversified tourism development through medium-term investments and reforms, integrating various demand segments and islands.
- 68 World Bank, *Creating Markets in Cabo Verde*.
- 69 Longline Environment, *Cabo Verde Aquaculture Atlas* (2023).
- 70 Pacific Disaster Center, *Cabo Verde municipal risk profiles* (Maui: Pacific Disaster Center, 2022).
- 71 World Bank, *Cabo Verde Country Economic Memorandum* (Washington, DC: World Bank, 2021).
- 72 T. Esch et al., “World Settlement Footprint 3D – A first three-dimensional survey of the global building stock,” *Remote Sensing of Environment* no. 270 (March 2022): 112877, <https://doi.org/10.1016/j.rse.2021.112877>.

- 73 M. Marconcini et al., “Outlining where humans live: The World Settlement Footprint 2015,” *Scientific Data* 7, 242 (July 2020): 1–14, <https://doi.org/10.1038/s41597-020-00580-5>.
- 74 World Bank World Development Indicators, Variable: Urban Population (% of total, SP.URB.TOTL.IN.ZS) (2021).
- 75 World Bank, “Development Indicators – Urban population (% of total population) – Cabo Verde,” last accessed January 11, 2025, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=CV>.
- 76 Urbanization has not occurred evenly throughout the country. Islands such as Santo Antão, São Nicolau, and Brava endured a population decline between 1992 and 2016, while Sal (96 percent urban), São Vicente (94 percent urban), and Boa Vista (86 percent urban) experienced an increase of more than 300 percent caused by a concentration of economic growth driven by tourism.
- 77 World Bank, *Project Appraisal Document Improving Connectivity and Urban Infrastructure in Cabo Verde* (P178644) (Washington DC: World Bank, 2023).
- 78 Republic of Cabo Verde, Decree-Law no. 4/2018, reforming the Territorial Planning Law (LBOTPU) promulgated on July 6, 2018.
- 79 World Bank, *Sailing Rough Seas*.
- 80 The built-up areas are measured using the World Settlement Footprint-Evo (WSF-Evo) dataset, which uses optical and radar satellite imagery to map human settlements (that is, any structure, including buildings, houses, infrastructure) and has been validated against 900,000 samples labelled by crowdsourcing photointerpretation of very high-resolution Google Earth imagery. Flood hazard is mapped using the Fathom dataset and refers to pluvial and fluvial floods. See World Bank, *Cabo Verde Country Economic Memorandum* (Washington, DC: World Bank, 2021).
- 81 World Bank, *Cabo Verde Country Economic Memorandum* (2021).
- 82 World Bank, *Cabo Verde Country Economic Memorandum* (2021).
- 83 Ana Campos Garcia and Keiko Sakoda, *Building Regulations in Sub-Saharan Africa: A Status Review of the Building Regulatory Environment* (Washington DC: World Bank, 2023), <https://documents1.worldbank.org/curated/en/099052523132014390/pdf/P1508350b1503303c097220feda9a523b9.pdf>.
- 84 Category C refers to countries that have a legally adopted building regulatory framework for planning, design, and building control, but which lacks comprehensive design provisions, last updated before 2000.
- 85 Internal document, under preparation by Cabo Verde’s Ministry of Infrastructure, Territorial Development and Habitat (MIOTH).
- 86 World Bank, *Creating Markets in Cabo Verde*.
- 87 The agriculture sector depends on reliable inter-island maritime infrastructure and routes, and robust port facilities to accommodate the growing cruise tourism subsegment for efficient freight distribution and access to islands. Because of high costs, freight air transport is not well adapted to substitute the maritime transport as solution to avoid disruptions in the agri-logistics sector.
- 88 Cabo Verde has a road network of 1,113 km.
- 89 The country has seven airports, four of which are international: Praia (Santiago), Sal Rei (Boa Vista), Espargos (Sal), and Mindelo (São Vicente). The government has granted a 40-year concession to Vinci Airports. See World Bank, *Creating Markets in Cabo Verde*.
- 90 World Bank, *Sailing Rough Seas*.
- 91 Between 2013 and 2019, the country experienced a substantial increase in airline seat capacity, with a compound annual growth rate of 9.2 percent, resulting in 2.77 million seats. However, COVID-19 led to Cabo Verde recovering only 71 percent of its 2019 capacity by 2022. See World Bank, *Cabo Verde Country Economic Memorandum* (Praia: Republic of Cabo Verde, 2022), 92.
- 92 Examples of existing public-private partnerships (PPPs) in Cabo Verde’s transport sector include: the 20-year concession contract signed in 2019 with Cabo Verde Interilhas (CVI), which was renegotiated in 2023 due to recurrent fiscal pressures; and the 40-year concession contract signed in 2022 with a joint venture between Vinci Airports and Aeroportos de Portugal, covering all airport services in Cabo Verde.
- 93 World Bank, *Cabo Verde Country Economic Memorandum* (2023).
- 94 More specifically, mitigation contribution areas include (1) reducing energy intensity and promoting energy efficiency, and (2) increasing RE targets (54 percent RE by 2030), including support for the emergence of local businesses, and support for women’s economic opportunities, particularly in the RE field, to reach at least 20 percent female representation in the workforce in 2030.
- 95 This program was funded by the Mitigation Action Facility and implemented by the German Agency for International Cooperation (GIZ) in collaboration with the Ministry of Industry, Commerce, and Energy (MICE).
- 96 The investments will upgrade and green the airports by installing renewable energy units, upgrading to energy-efficient LED lighting, and installing advanced cooling systems to reduce GHG emissions. The contract specifies performance indicators including a measurable reduction in GHG emissions and the attainment of Airport Carbon Accreditation.
- 97 World Bank, *Circular and Resilient Tourism on Small Islands and in Coastal Destinations: Circular Economy Gap Analysis: Cabo Verde* (Washington, DC: World Bank, 2023).
- 98 Potential climate change impacts on digital connectivity vary considerably for below-ground infrastructure, above-ground infrastructure, and wireless-, radio-, or satellite-based services.

- 99 Coastal areas, the backbone of the tourism sector and home to valuable fisheries ecosystems, are increasingly exposed to climate change.
- 100 Below-ground infrastructure could be impacted by flash floods, a rise in sea levels, subsidence caused by drought or flooding, and damage to surface infrastructure (such as roads). Above-ground infrastructure could be impacted by changes in precipitation, high winds, and ground instability. Wireless-, radio-, or satellite-based services could be impacted by rising temperatures, increasing precipitation, and changes in vegetation caused by changes in climate.
- 101 The industrial sector, which mostly processes agricultural products, accounts for 18 percent of GDP. Higher production costs may also result from price volatility in the major commodities due to the carbon pricing policies of main trade partners.
- 102 GTAP emissions refer to greenhouse gas emissions data integrated into the Global Trade Analysis Project (GTAP) framework. GTAP is a widely used computable general equilibrium (CGE) model and database designed to analyze the interactions between global trade, the economy, and environmental factors, including climate change.
- 103 RSIE and the discontinued Solidarity Income (Rendimento Solidário) program.
- 104 Republic of Cabo Verde, *Programa de Emergência para a Mitigação da Seca e do Mau Ano Agrícola (PEMSMAA) 2017/2018; Programa de Mitigação e de resiliência à seca em 2019; Programa de Mitigação dos Resultados do Mau Ano Agrícola 2021/2022* (Praia: Government of the Republic of Cabo Verde, 2017 and 2021).
- 105 The ongoing IMF Resilience and Sustainability Facility (RSF) program in Cabo Verde, which ends in June 2025, includes a reform to expand the coverage of the CSU to 100 percent of households in climate-vulnerable areas of the country.
- 106 The Family Support Program is a set of actions and activities to support families in accessing essential goods and services: education, water, health, basic sanitation, vocational training, social housing, and food security. It also provides guidance and training to families for better coexistence and integration into the community where they live.
- 107 The current measures include i) the issuance of a Declaration of Alert, Contingency, or Calamity, as defined by the criteria outlined in the Basic Law on Civil Protection; ii) meteorological, climate, geophysical, and seismic monitoring conducted by the National Meteorology and Geophysics Institute; and iii) the monitoring of rainfall and food and nutrition security levels by the National Secretariat for Food and Nutrition Security, which evaluates Cabo Verde's food and nutrition security status biannually, in March and November.
- 108 See A.T. Kuriakose et al., "Climate-Responsive Social Protection," *Development Policy Review* 31, no. s2 (November 2013): o19–o34, <https://doi.org/10.1111/dpr.12037>.
- 109 Support for families consisted of gas subsidies, the purchase of water, and the distribution of vouchers to buy food in stores. To determine the support for each of the families, an analysis was made of various factors such as (i) families living in rural areas that depend on agricultural production; (ii) families that have difficulty accessing water for human consumption; (iii) families that have lost their crops and have no other source of income; and (iv) families living in extreme poverty, namely, National Centre of Social Pensions (CNPS) pensioners; poor families headed by women; poor families with children in their care; and poor families with members with special needs.
- 110 International Monetary Fund (IMF), *Demographic Dividends, Gender Equality, and Economic Growth: The Case of Cabo Verde*, IMF Working Paper (Washington, DC: IMF, 2016).
- 111 Republic of Cabo Verde, *Millennium Development Goals Report*.
- 112 Discounted at a 6 percent annual rate.
- 113 The power and transport sectors considered the costs for the full transition to RE and EV mobility.
- 114 Government-owned cars by 2030, buses by 2035, and private cars by 2050. Assumptions based on the NDC.
- 115 Or US\$5 billion if not discounted. This includes US\$2.8 billion in fuel imports saved in the power sector, compared to a scenario where fuel imports grow at the same rate as projected electricity demand, and US\$2.2 billion in fuel imports saved in the transport sector, compared to a scenario of no transport electrification where fuel imports grow by 4 percent a year.
- 116 Policies that could be considered include improving the information of the social registry to sharpen targeting and to make it easier to update it over time, developing one-stop shops for social services, and modernizing early-warning systems. Such key components of the strategy can help ensure that the most vulnerable households are adequately supported.
- 117 Footnote on public debt in the baseline going down, and climate action offsetting current efforts to curb public debt.
- 118 All amounts are discounted at a rate of 6 percent. In comparison, Cabo Verde's updated NDC estimates the total funding required to support adaptation and mitigation investments at US\$2 billion over 2020–2030, or about US\$181 million per year (US\$138 million if discounted at 6 percent).
- 119 Domestic state budget resources committed to environmental protection and climate change cover only 15.4 percent of current estimated needs over 2020–2030. This implies there is a large gap that needs to be filled by international public funders and the private sector. See African Development Bank (AfDB), *Country Focus Report 2023 – Cabo Verde: Mobilizing Private Sector Financing for Climate and Green Growth* (Abidjan, Côte d'Ivoire: AfDB, 2023), <https://www.afdb.org/en/documents/country-focus-report-2023-cabo-verde-mobilizing-private-sector-financing-climate-and-green-growth>.
- 120 In 2019–2020, climate finance flows to Cabo Verde came primarily from multilateral development banks (52.4 percent), followed by government sources (43.5 percent), international climate funds (4.2 percent), and the private sector (less than 2 percent).

- 121 The restructuring would expedite the energy transition, bolster investor confidence, diminish generation costs and non-technical losses, and enhance service quality. Additional supportive strategies include defining a regulatory framework for battery energy storage systems, establishing an aggregation mechanism to offer larger-scale projects to private investors, and implementing a unified risk mitigation initiative for renewable energy investments. Moreover, updating the electricity sector master plan to an integrated energy planning framework would help mobilize private investment.
- 122 Mostly concentrated in a Portuguese bank that offers favorable terms.
- 123 The bond was oversubscribed and attracted 127 investors, including 100 retail investors, some from the Rwandan diaspora. The credit enhancement allowed Development Bank of Rwanda (BRD) to provide end borrowers with new lending at a rate half of what it would have been if BRD had passed through the 14 percent terms from a plain-vanilla issuance. Issued in Rwandan francs, the bond also prevented BRD from being exposed to foreign exchange risks.
- 124 On June 20, Portugal and Cabo Verde signed an MoU to swap part of Cabo Verde's debt for investments in a Climate and Nature Fund. Initially, EUR 12 million of debt repayments to Portugal scheduled until 2025 will be channeled through this new funding vehicle, which is currently under design, to finance priority climate resilience and nature-positive investments. Additional debt service payments could potentially be channeled into the fund and cover Cabo Verde's remaining debt to Portugal, around EUR 140 million.
- 125 The Rwanda Green Fund, FONERWA, established in 2012, has become a prime driver of innovation and partnerships for climate and nature investments that have reached US\$300 million as of 2024. In 2022, it created Ireme Invest, a new green investment facility, to enhance Rwanda's capacity to advance financial innovation and accelerate climate measures by leveraging private investments in low-carbon, climate-resilient technologies and sectors. It is a one-stop center for green and sustainable investment that supports the private sector to access green finance and has a project preparation facility and a credit facility. Investment areas include (1) clean energy; (2) smart mobility; (3) sustainable cities; (4) climate-smart agriculture; and (5) waste management and the circular economy. Along with its financing contributors to Ireme Invest, BRD is currently finalizing a pipeline of private sector projects, estimated at EUR 400 million, based on a common set of eligibility criteria, governance, and reporting mechanisms.
- 126 The bond framework adhered to International Capital Markets Association (ICMA) principles as well as a blue taxonomy developed by Cabo Verde's Atlantic Technical University and was externally reviewed by Ernst and Young. The US\$2.5 million proceeds supplied affordable loans to microentrepreneurs and startups, and financed structural investments in SMEs operating in the maritime and fisheries sectors.
- 127 In January 2022, an MoU was also signed between the Luxembourg Stock Exchange and BVC to facilitate cooperation in capital market activities, focusing on sustainable finance. In November 2023, the International Investment Bank's EUR 3.2 million Marine and Ocean-Based Blue Bond became the first bond to be cross-listed on both platforms.
- 128 However, even though these bonds and loans are issued to attain defined KPIs, they are nonetheless general-purpose bonds/loans, meaning that the funds are not tied to a particular use-of-proceeds allocation.
- 129 ICMA (International Capital Markets Association), Sustainability-Linked Bond Principles: Voluntary Process Guidelines (2023), <https://www.icmagroup.org/assets/documents/Sustainable-finance/2023-updates/Sustainability-Linked-Bond-Principles-June-2023-220623.pdf>.
- 130 Ministry of Finance of Uruguay, *Sovereign Sustainability-linked Framework (SSLB)* (Montevideo: Ministry of Finance, 2022).
- 131 Estimations performed using a methodology developed in World Bank, *Ambitious, yet feasible: Setting FAB targets for sustainable financing instruments* (Washington DC: World Bank, 2023).
- 132 Republic of Cabo Verde, Resolution 39/2019 (2019).
- 133 Secretariat of the Convention on Biological Diversity and United Nations Development Programme, *Aichi Biodiversity Target 11 Country Dossier: CABO VERDE* (Montreal and New York: SCBD and UNDP, 2021), <https://www.cbd.int/pa/doc/dossiers/cabo-verde-abt11-country-dossier2021.pdf>.
- 134 World Bank, "Investors Support Amazon Reforestation Through Record Breaking USD 225 Million World Bank Outcome Bond," press release, August 13, 2024, <https://www.worldbank.org/en/news/press-release/2024/08/13/investors-support-amazon-reforestation-through-record-breaking-usd-225-million-world-bank-outcome-bond>.
- 135 Discounted at a 6 percent annual rate.
- 136 Andrew, Burns, Benoit Philippe Marcel Campagne, Charl Jooste, David Andrew Stephan, and Thi Thanh Bui, "The World Bank Macro-Fiscal Model Technical Description." Policy Research Working Paper no. 8965 (Washington, DC: World Bank, 2019).
- 137 For additional information about the three extensions, see Andrew Burns, Charl Jooste, and Gregor Schwerhoff, "Macroeconomic Modeling of Managing Hurricane Damage in the Caribbean: The Case of Jamaica," Policy Research Working Paper no. 9505 (Washington, DC: World Bank, 2021), <https://hdl.handle.net/10986/34982>; Andrew Burns, Charl Jooste, and Gregor Schwerhoff, "Climate-modeling for macroeconomic policy: A case study for Pakistan," Policy Research Working Paper (Washington, DC: World Bank Group, 2021), <http://documents.worldbank.org/curated/en/747101632403308927/Climate-Modeling-for-Macroeconomic-Policy-A-Case-Study-for-Pakistan>; and Stéphane Hallegatte, Charl Jooste, and Florent McIsaac, "Modeling the macroeconomic consequences of natural disasters: Capital stock, recovery dynamics, and monetary policy," *Economic Modelling* 139 (October 2024): 106787, <https://doi.org/10.1016/j.econmod.2024.106787>.

