

Seychelles: Climate Change Policy Assessment



SEYCHELLES

CLIMATE CHANGE POLICY ASSESSMENT

June 2017

This paper on Seychelles was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed on May 18, 2017.

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Approved By
**African and Fiscal
Affairs Departments**

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CONTENTS

Glossary	5
EXECUTIVE SUMMARY	6
A. Recommendations	8
INTRODUCTION	11
SEYCHELLES' CLIMATE CHANGE RISKS AND EXPECTED IMPACTS	13
A. Impact of climate change risks on the macro-framework/long-term outlook	13
GENERAL PREPAREDNESS FOR CLIMATE CHANGE	15
A. The NDC and other national resilience-building strategies	15
B. Disaster planning and other contingency plans	16
CONTRIBUTION TO MITIGATION	17
A. Clean energy plans	17
B. Carbon taxation and fuel subsidy policies	18
C. Other carbon pricing strategies	21
D. Other macro-relevant policies for mitigation	22
ADAPTATION PLANS	23
A. Public investment plans	23
B. Other public programs (regulation reform, zoning...)	25
C. Financial sector preparedness	26

FINANCING STRATEGY FOR MITIGATION AND ADAPTATION PROGRAMS	29
A. Current state of financing	29
B. Consistency of climate change spending and financing plans with fiscal and external debt sustainability	31
C. Other macro-considerations	32
D. Institutional issues	33
RISK MANAGEMENT STRATEGY	35
A. Risk assessment procedures (e.g., fiscal risk statement)	35
B. Self-insurance (government financial buffers including contingency provisions, rainy-day funds, NIR ...)	35
C. Risk reduction and transfer (other insurance, pooling arrangements)	36
NATIONAL PROCESSES	39
A. Integration of climate change into national planning processes	39
B. Adequacy of public investment management system (effectiveness of procedures for identifying, evaluating, selecting, and implementing projects)	40
C. Adequacy of PFM systems for managing CC financing and outlays (transparent on-budget treatment of CC activities, multi-year budgeting, etc.)	42
TAKING STOCK: PRIORITY NEEDS TO BE MET	43
A. What resources does Seychelles need to mobilize, to achieve its climate-change strategy?	43
BOXES	
1. Priority Needs to Be Met	10
2. Asset Management and Operational Aspects of a Contingency Fund	38
FIGURE	
1. Current Fuel Prices Augmented by Proposed 2020 and 2030 Carbon Tax	21
TABLES	
1. Seychelles—Recent and Expected Climatic Developments	12
2. Cost of Priority Mitigation Options for Seychelles' NDC	17
3. Fuel Tax Rates and Revenues, 2015	19
4. Seychelles NDC 2015--Costed Climate Change Projects	28
5. Seychelles--Climate-Related Projects Identified in the PSIP	30

ANNEXES

I. Disaster Risk Management	45
II. World Bank and Global Environment Facility Support to Blue Economy Resilience: The Swiofish3 Project and The Blue Bond	48
A. Sector and institutional context	48
B. The SWIOFish3 project	50
C. Project financing and the Blue Bond	52
III. Pima Institutional Questionnaire—Interview Responses From Seychelles	54

APPENDIX

1. CCPA Template	57
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GLOSSARY

CCPA	Climate Change Policy Assessment
DRDM	Division of Risk and Disaster Management
DRM	Disaster Risk Management
FSA	Financial Services Authority
GCF	Green Climate Fund
GEF	Global Environment Facility
INDC	Intended Nationally Determined Contribution
IPP	Independent Power Producer
MEECC	Ministry of Environment, Energy, and Climate Change
MFTEP	Ministry of Finance, Trade, and Economic Planning
NDC	Nationally Determined Contribution
PEFA	Public Expenditure and Financial Accountability (Assessment)
PFM	Public Financial Management
PIMA	Public Investment Management Assessment
PPP	Public-Private Partnership
PSIP	Public Sector Investment Program
PUC	Public Utility Corporation
SEC	Seychelles Energy Commission
SEYPEC	Seychelles Petroleum Company
SNAIP	Seychelles National Agriculture Investment Plan
SRC	Seychelles Revenue Commission
SSDS	Seychelles Sustainable Development Strategy
TSA	Treasury Single Account
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organization

EXECUTIVE SUMMARY

Seychelles has put climate change at the center of its sustainable development strategy, more purposefully than most other small states. Its Nationally Determined Contribution (NDC) submission to the Paris Agreement outlined a balanced mitigation and adaptation strategy, accompanied by costed investment plans.

This paper takes stock of Seychelles' plans to manage climate change, from the perspective of their macroeconomic implications. It suggests macro-relevant reforms that could strengthen the plans' likelihood of success.

General preparedness for climate change. High public awareness and a body of existing sustainable development planning put Seychelles several steps ahead towards preparedness. Next steps would be to ensure climate change planning is integrated with the forthcoming National Development Plan, including by identifying costed priority projects in the Plan and eventually in budget documents. Disaster preparedness is a relatively strong point, but a big unfinished agenda still remains (from improving warning systems to resilience-building to contingency financing).

Mitigation. Seychelles plans to meet its emission reduction targets mainly by switching to renewable energy, improving energy efficiency, and bringing in electric cars. These plans have many important benefits—including energy security and a lower import bill—but are quite uncertain (for instance, the technology is still evolving). Introduction of a carbon tax would be a useful complement to these plans. It would change a wider range of behavior and would also help solve the problem of declining fuel tax revenue in the face of success in containing emissions. Reforms to vehicle taxation (a 'feebate' system), and adjustments to electricity tariffs so they cover marginal costs, would also go in the right direction—as would price incentives to reduce waste and congestion.

Adaptation. Plans for adaptation to climate change are less fully-articulated in the NDC than on the mitigation side. For instance, the Blue Economy seems under-represented, given its importance to the economy. Completion of sectoral plans will allow the adaptation strategy to be updated—and is likely to expand the list of priority investments (also in fisheries and agriculture, water, critical infrastructure, health, and tourism). Land-use planning is key for building resilience and the existing strategy should be updated for climate-proofing. Consideration should be given to what role the financial sector can usefully play (in financing and disaster-preparedness).

Financing. The cost of the investment projects identified in the NDC is 40 percent of 2016 GDP (US\$604 million). Currently, around 3½ percent of GDP in climate-related projects has been reflected in the Public Sector Investment Program for 2017-19 (PSIP)—meaning that financing has

been identified and the project authorized. While investment at this pace is likely to be consistent with long-run debt sustainability, there will be some tension between Seychelles' moving fast enough to meet its climate change goals and adhering to its 50 percent of GDP debt target. Hence, mobilizing private investment and concessional financing will be particularly important. Private investment is more likely to be forthcoming for mitigation than for adaptation—but innovative financing approaches may help on both sides. Care should be taken that all innovative financing instruments are good value for money. As Seychelles builds experience with mobilizing climate financing, it should seek to economize on the cost of accessing funds. In the economy's tight labor market, consideration should also be given to pacing the investment program to avoid inflation or overheating.

Risk management. Seychelles has some key elements of a risk management strategy, but financial buffers should be increased, and insurance developed. As regards buffers, the contingency line in the budget is small ("one government building"). Hence, a revival of the Contingency Fund is recommended, built up gradually by saving unused contingency appropriations in years without disasters. Insurance is currently contributing little to risk transfer; making insurance mandatory for buildings in flood-risk areas could help change behavior and save lives.

National processes. Seychelles has been upgrading institutional processes steadily over the past decade, but suffers from many of the capacity constraints common to small states. In principle, the planning and public investment system is good (sectoral plans feed the National Development Plan which provides the prioritization for selecting projects to go into the PSIP and the annual budget) but in practice work is needed to keep the procedures updated, consistent with each other, and fully costed. Seychelles has some good procedures for managing public investment and public funds but capacity in the Ministry of Finance and elsewhere needs strengthening to execute them effectively. In some cases, legislation also needs to be updated, including the PFM Act which should ensure that all loans and grants go through the MFTEP.

Priority needs. To meet its renewable energy plans, Seychelles will need private investment, and also public financing or external support to develop supporting infrastructure. While some adaptation measures may be bankable projects (e.g., in tourism), most resilience-building is likely to require public financing or external support. Capacity-building would be most useful to help cost sectoral plans, complete the disaster-preparedness strategy, move toward carbon taxation, and strengthen skills in public investment management and PFM.

A. Recommendations

General preparedness

1. Maintain the NDC up-to-date, in line with the Paris process, as a high-profile summary strategy of Seychelles' climate-change-related effort.
2. Finalize the National Economic Development Plan and sectoral plans, with focus on costing and resource mobilization.
3. Reduce vulnerability to natural disasters and climate change by:
 - Further strengthening land use planning and sector development;
 - Reviewing building codes and enhancing their enforcement;
 - Further developing a Disaster Risk Financing and Insurance Strategy for the public sector and promoting increased insurance for the private sector;
 - Developing sector-specific and area-specific contingency plans;
 - Further strengthening the hydro-meteorological network;
 - Enhancing early warning systems and emergency response;
 - Further implementing coastal protection and measures to mitigate coastal erosion;
 - Increasing the urban resilience of Victoria;
 - Capacity-building, education, and awareness among the population; and
 - Enhancing technological capacity for research on climate change modeling and risks, monitoring of impacts, and implementation of resilience-building.

Mitigation

4. Gradually introduce a carbon tax, to achieve a carbon price of 360 rupees per ton by 2020, and 1,260 rupees/ton by 2030. This should be applied across the whole carbon tax base (power generation as well as road fuels).
5. Raise electricity tariffs to cover marginal costs.
6. Change vehicle taxation to an ad valorem rate plus 'feebate' system.
7. Consider price incentives to reduce waste (such as 'pay-per-bag' trash schemes and deposit refunds for hazardous waste).
8. Explore congestion fees or tolls to keep traffic sustainable.

Adaptation

9. Clarify the details (projects and timing) of the adaptation proposals in the NDC.
10. Use completed sectoral strategies to identify additional adaptation needs (for instance, in the SNAIP or the Roadmap for the Blue Economy)—and include these in the NDC update.
11. Clearer investment plans would help Seychelles identify financing gaps, especially in frontline areas: water, critical infrastructure, health, and tourism.
12. Update the Seychelles Strategic Land Use Plan to adequately address sea-level rise and storm surges.

Financing

13. Develop a comprehensive picture of financing needs, including contingency financing.
14. To ensure continued fiscal and debt sustainability, rely as much as possible on private sector and concessional financing to execute the NDC.
15. Success with the clean energy strategy should be high-priority, not least because it will strengthen Seychelles' balance of payments.
16. However, care will need to be taken to offset any revenue loss from fuel and vehicle taxation—one reason a carbon tax would be valuable.
17. Plan the execution of investments to be consistent with avoiding overheating/inflation, given Seychelles' near-to-full employment.
18. As experience with mobilizing climate finance develops, seek to economize on the costs of accessing funds.
19. Ensure that innovative financing packages offer value-for-money.

Risk management

20. Over time, Seychelles should develop costing of tail events, and use this costing (e.g., the need for to provision for a moderate disaster) to guide its contingency budgeting.
21. The contingency fund should be re-established. This could be achieved gradually, by saving the annual budget contingency allocation every year it is not drawn down.
22. Consider making insurance mandatory for buildings in flood-risk areas from now on. Over the medium term, explore the cost-effectiveness of insurance as a supplementary buffer, for instance, to insure key government buildings.

National processes

23. Ensure that climate change objectives and activities are systematically identified throughout the budget, and investment projects explicitly linked to these.
24. Review legislation for consistency with sectoral strategies and update where needed (for instance, the Energy Act).
25. Pass the PPP Act.
26. Build capacity for effective public investment appraisal and monitoring, in MFTEP and other relevant ministries.
27. Amend the PFM Act to ensure all loans and grants go through the MFTEP, and develop a policy for managing donor funding.

Box 1. Priority needs to be met

Government financing or external support

- Completion of the disaster-preparedness strategy
- Quasi-public goods to support renewable energy strategy
 - Strengthening the electricity grid
 - Charging stations for electric vehicles
- Critical infrastructure (US\$70 million ++)
- Tourism/coastal management (US\$45 million ++)
- Blue economy: (US\$15 million ++)
- Water security (US\$85 million +)
- Food security (US\$35 million +)
- Health (US\$30 million +)
- Biodiversity (US\$15 million +)
- Land use to address sea-level rise and storm surges (not yet costed)

Private investment

- Solar PV for public electricity, including for electric vehicles (US\$222 million)
- Electric vehicles (US\$67 million)
- Waste management (US\$21 million)
- Complements to public investment where a business case can be made:
 - Critical infrastructure
 - Tourism/coastal management
 - Food security
 - Biodiversity
 - Water security
 - Health
 - Blue economy

Capacity-building

- Completion of the disaster-preparedness strategy
- Integration of climate-related activities into costed sectoral plans
- Carbon taxation (especially to rationalize pricing of power and subsidies to fisheries, and possibly vehicle taxation and congestion pricing)
- Waste management
- Further development of public investment management skills
- Further strengthening of public financial management skills

INTRODUCTION

This report is the first pilot Climate Change Policy Assessment for Small States. It was developed by IMF and World Bank staff in collaboration with the Government of Seychelles. It integrates climate change impact and needed policy responses into a holistic macro framework—to assist small states to understand and manage the expected impact of climate change, while safeguarding long-run fiscal and external sustainability.

- 1. The IMF and World Bank are cognizant of the special vulnerability of small states to natural disasters and climate change.** For many small states, the economic costs of climate change will be much greater than for larger peers, and could pose difficult problems for macroeconomic management. Hence, they need to develop strategies and policy frameworks to manage the macroeconomic implications of climate change. At a meeting of its Executive Board on December 1, 2016, the IMF authorized staff to develop a Climate Change Policy Assessment (CCPA) to support small states in building resilience to climate change, and to shed light on the financial costs of doing so. It requested that the Assessment be carried out jointly with the World Bank, to draw on its special expertise and broader developmental mandate.
- 2. Seychelles has been a key advocate for small states in international climate change negotiations, and is also recognized for innovations in climate change financing.** Its role as a thought-leader has been influential in shaping concerns about the impact of climate change, and in mobilizing an international response. Its submission to the Paris Agreement provides an important roadmap for how Seychelles intends to meet the challenges of climate change ([Republic of Seychelles Intended Nationally Determined Contribution under the UNFCCC](#)).¹ Hence, this first pilot has been undertaken with the expectation that lessons learned in Seychelles will be especially helpful to other small states.

An overview of the report

- 3. For easy reference, the report broadly replicates the recommended structure of the NDC:** it first discusses general preparedness for climate change; the mitigation commitment and strategy; adaptation needs and strategy; national processes; and financing. However, the focus of the report is on the macroeconomic challenges that may be confronted in dealing with climate change, and policy recommendations for responding adequately to these.²

¹ Countries' Intended Nationally Determined Contributions (INDCs) were retitled Nationally Determined Contributions (NDCs) upon ratification of the Paris Agreement.

² The CCPA will be attached to the papers for the IMF's 2017 Article IV Consultation, and—since the Government of Seychelles has agreed to publication—will be available for public distribution after the Article IV Board meeting.

Table 1. Seychelles—Recent and Expected Climatic Developments¹

Temperatures	<ul style="list-style-type: none"> Seychelles had an average warming of 0.25°C over the 1972-1997 period. The number of very warm days and nights is increasing dramatically, while the number of very cool days and nights is declining; in 1998 these extremes led to a loss of 90 percent of coral reefs (only partly reversed).
Precipitation and flooding	<ul style="list-style-type: none"> Annual rainfall anomaly trends on Mahé are upward by 13.7 mm per year (1972-2006), indicating a wetter climate. Extreme rainfall has caused significant crop losses in the last decade. Heavy rainfall during 1997-98 El Nino and 1998-00 La Nina events caused widespread flooding with significant losses to the economy. The government reported that fisheries accounted for 45% of El Nino/La Nina losses, followed by agriculture (28%) and tourism. Increases in rainfall intensity may also result in greater surface runoff and reduced water capture in storage facilities and could pose health risks.
Droughts	<ul style="list-style-type: none"> In 2010 Seychelles suffered its worst drought in decades, followed by severe flooding. This notably affected farmers' productivity. It is projected that the climate will likely be characterized by extreme dry (i.e., prolonged dry spells) and hot episodes.
Sea level rise	<ul style="list-style-type: none"> Sea level rise is already affecting Seychelles, such as in May 2007 when very high tides resulted in flooding up to 50m inland causing damage to roads, public infrastructure. Sea level rise is expected to lead to coastal erosion, impacting infrastructure especially tourism and roads. Sea level change is also expected to increase salination of the soil and aquifers impacting food and water supply.
Landslides	<ul style="list-style-type: none"> Short, intense rain events are known to trigger landslides, such as in Jan 2013 when Pointe Au Sel in the southeast of the island reported 184mm of rain in a 24-hour period – nearly half the amount of rain expected in the entire month of January Landslides and rock falls cause damage to transport infrastructure and houses and are expected to worsen.

¹ See ThinkHazard (GFDRR/World Bank) for a list of most common geophysical disasters <http://thinkhazard.org/report/220-seychelles>. Climate Change data are provided by The World Bank's Climate Change Knowledge Portal (CCKP) www.climateknowledgeportal.worldbank.org. The CCKP will include a comprehensive climate profile for Seychelles by mid-2017.

SEYCHELLES' CLIMATE CHANGE RISKS AND EXPECTED IMPACTS

Seychelles mainly lies outside the cyclone belt, so its economic concerns about climate change center on the damage likely to be caused by rises in sea level and temperature to tourism and fishing. But also, one large natural disaster could undo the hard-won macroeconomic stability gains of the past eight years.

A. Impact of climate change risks on the macro-framework/long-term outlook

- *How vulnerable is Seychelles' economy to climate change?*

4. **Seychelles is seriously vulnerable to climate change, though the location of many of its islands slightly outside the cyclone belt has meant relatively less exposure to catastrophic natural disaster.** Its primary concerns are from the economic costs of temperature rise (coral bleaching and losses to fisheries and tourism); extreme rainfall (crop and fish losses, flooding); and sea-level rise (coastal erosion and salinization, and consequent losses to tourism and food and water security)—see Table 1. Seychelles has been hit only once in recent years by a major natural disaster which imposed economic damage of over 3 percent of GDP. With this record, it ranks 26th among 33 small states worldwide in vulnerability to natural disasters (2 percent of GDP is the average annual cost of natural disasters for small states).³ Nonetheless, its topography and landscape leave it extremely vulnerable to strong winds, tsunamis, storm surge, extreme rainfall, flooding, landslides, rockslides and forest fires, the frequency of which has been rising. Moreover, the cyclone belt may be shifting (though evidence is still inconclusive).

Seychelles: Major Natural Disasters			
Year	Disaster type	Number of people affected	Estimated economic damage (in percent of GDP)
1997	Flood	1,237	0.5
2004	Tsunami	4,830	3.6
2013	Tropical storm	3,000	0.7

Source: EM-DAT

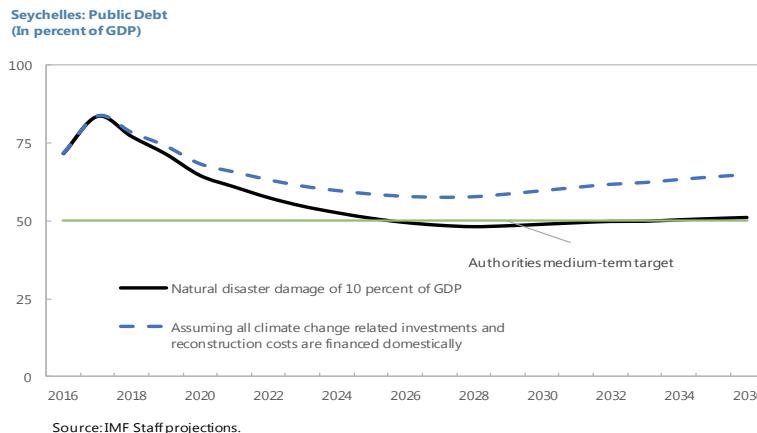
- What impact could climate change have on macro-sustainability?

5. **Seychelles could withstand a disaster more serious than in recent history while remaining financially sustainable, but is vulnerable to a tail-risk catastrophe.** Two scenarios were considered for assessing Seychelles' financial resilience to intensified disasters: a storm

³ See the Board paper "Small States' Resilience to Natural Disasters and Climate Change—Role for The IMF" (IMF, November 2016).

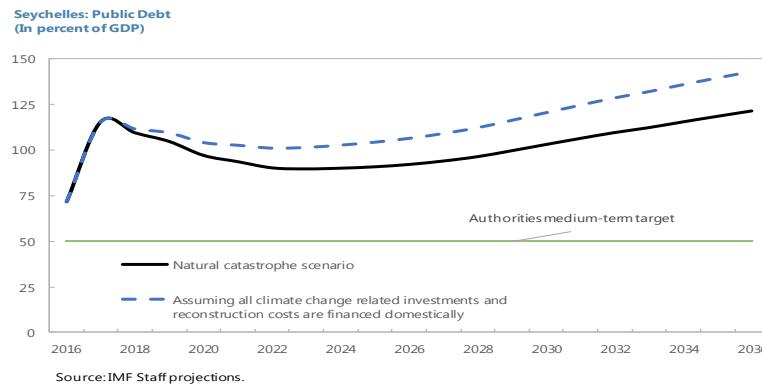
causing damage of 30 percent of GDP (the threshold for access to the IMF shocks facility) and a more plausible-but-still-extreme storm causing 10 percent of GDP in damages.

- **Seychelles could withstand a natural disaster costing up to 10 percent of GDP without losing debt sustainability.** The first-hand chart below illustrates long-term public debt dynamics if Seychelles were hit by a storm causing economic damage of 10 percent of GDP in 2017. The shock to GDP and subsequent reconstruction costs,⁴ coupled with some pressure on inflation and the exchange rate over the following two years, would cause the debt ratio to spike to around 85 percent of GDP in 2017 (from slightly over 70 percent in 2016), gradually declining to around 50 percent by 2036. In other words, Seychelles has enough financial resilience to withstand a reasonably large disaster but would suffer a significantly heavier debt burden.



to around 85 percent of GDP in 2017 (from slightly over 70 percent in 2016), gradually declining to around 50 percent by 2036. In other words, Seychelles has enough financial resilience to withstand a reasonably large disaster but would suffer a significantly heavier debt burden.

- **A more catastrophic tail risk scenario would make debt unsustainable.** A storm causing economic damage of 30 percent of GDP in 2017 would push up public debt to around 120 percent of GDP in the long run.⁵ Under similar assumptions to the first scenario (but with reconstruction investments costing 15 percent of GDP), GDP growth would be depressed for two years after the storm, with much sharper inflation and exchange rate depreciation. Public debt would spike to 115 percent of GDP in the year of the storm. Even with reasonable assumptions about concessional help for reconstruction from the



⁴ Public investment for reconstruction is assumed to cover half the costs—i.e., 5 percent of GDP implemented over five years—financed by a balanced mix of domestic and external concessional and non-concessional funds.

⁵ See Selected Issues Paper for the 2017 Article IV Consultation with Seychelles, forthcoming.

(continued)

international community, the rising trend in debt would be difficult if not impossible to reverse. Debt would decline for the next several years to around 90 percent, but would then start rising unsustainably, given principal repayments on concessional borrowing and a much heavier interest burden (second chart below).⁶

GENERAL PREPAREDNESS FOR CLIMATE CHANGE

Seychelles has a good NDC and a better-articulated holistic vision of sustainable development than in most peer countries. The updates to national strategy documents should be completed and sectoral strategies clarified. Disaster preparedness is a relatively strong point but a big agenda still remains.

A. The NDC and other national resilience-building strategies

- *Does the NDC present a comprehensive and costed strategy for climate change response?*

6. **Yes, though an update would make it even better.** The NDC submitted by Seychelles for the Paris Agreement presents a clearly-articulated national strategy for responding to climate change⁷

7. It includes a commitment to emissions reduction, a quantified mitigation strategy to meet the reduction target, adaptation plans, and costing of identified projects on both the mitigation and adaptation sides. The strategy is comprehensive in coverage compared with many other NDCs, particularly those of other small states; the NDC is considered a model for other small states to follow. However, the authorities intend to expand the treatment of the Blue Economy when they update the NDC.

- *Is the climate change strategy consistent with broader development goals?*

8. **Yes.** Climate change has for some time been deemed the likely greatest threat to Seychelles' sustainable development, because of its heavy dependence on tourism and fisheries. Public awareness of environmental fragility and the need for government policy action appears to be at a high level. The country's broader vision of sustainable development is heavily focused on environmental management and was summarized in Seychelles' Sustainable Development Strategy 2012-2020 (SSDS). The NDC is broadly consistent with the SSDS, although some targets

⁶ In these scenarios, Seychelles' growth rate reflects the continuation of existing environmental pressures, rather than assuming any worsening due to climate change. That is, the impact of climate change is being measured only by the economic cost of the disaster. This is partial and far from ideal; however, current modelling of the impact of climate change on growth other than through an intensification of disasters leaves too many questions unanswered to justify providing a quantification for Seychelles.

⁷ [Republic of Seychelles Intended Nationally Determined Contribution under the UNFCCC](#).

have been updated. The SSDS is being updated and expanded into a comprehensive National Economic Development Plan which will draw on sectoral plans and have more focus on resource mobilization; this is expected by end-2017. Other documents are being prepared to operationalize aspects of the development strategy, notably the Roadmap for Renewables from the Ministry of Environment and Energy, and the Roadmap for the Blue Economy from the Vice-Presidency.

B. Disaster planning and other contingency plans

- *How well-prepared is Seychelles to cope with possible intensified disasters?*

9. **Disaster planning is a relatively strong point, although the preparedness challenge is large and unfinished.** The government subscribed to the Hyogo Framework, and developed a National Disaster Risk Policy, most recently updated in 2014. The Division of Risk and Disaster Management (DRDM), now under the Ministry of Environment, Energy and Climate Change (MEECC), is responsible for coordinating both Seychelles' disaster risk reduction effort and emergency response to a natural catastrophe or manmade emergency. It has established a National Emergency Operations Center. (For more detail, see Annex I.)

10. **While funding doubtless remains inadequate to cover the cost of a large catastrophic event, Seychelles has mobilized some innovative financing.** It is the only small state to have negotiated a CatDDO with the World Bank—a contingency credit line with drawdown in the event of an emergency. This is expected to be renewed for another three years and expanded. Seychelles also has a small budget contingency line (discussed further below).

11. **In spite of considerable progress, work remains needed.** The legal framework requires updating to clarify DRDM's mandate. Land-use planning needs to be improved, for instance to reduce vulnerability to floods. And despite improvements in institutional capacity to manage disaster risk, there are still gaps in financial and staff resources and in technical and operational capacity.

Recommendations for general preparedness

1. Maintain the NDC up-to-date, in line with the Paris process, as a high-profile summary strategy of Seychelles' climate-change-related effort.
2. Finalize the National Economic Development Plan and supporting operational sectoral plans, with focus on costing and resource mobilization.
3. Reduce vulnerability to natural disasters and climate change by:⁸

⁸ See Annex I and World Bank program documents for the DPL/CAT-DDO (report no. 88264-SC and updates).

- Further strengthening risk-informed land use planning and sector development;
- Reviewing building codes for residential and commercial buildings and public assets (incl. buildings, drainage, transport infrastructure, utilities) and enhancing their enforcement;
- Further developing a Disaster Risk Financing and Insurance Strategy for the public sector and promoting increased insurance penetration for the private sector;
- Developing sector-specific and area-specific contingency plans;
- Further strengthening the hydro-meteorological network, and its monitoring and forecasting capacities;
- Enhancing early warning systems and emergency response;
- Further implementing coastal protection and other measures to mitigate coastal erosion;
- Increasing the urban resilience of Victoria.
- Capacity building, education and awareness among the population; and
- Enhancing the technological capacity to undertake effective research on climate change modeling and risks, monitoring of climate change impacts and implementation of resilience-building measures.

CONTRIBUTION TO MITIGATION

Seychelles plans to meet its emission reduction targets mainly by switching to renewable energy and electric cars. It should also consider a carbon tax and pricing reforms for power and vehicles.

Seychelles' NDC pledges to reduce greenhouse gases (GHGs) by 122.5 kilotons (kt) of carbon dioxide equivalent (CO₂e) in 2025, or 21.4 percent below 'business as usual' (BAU) levels, and by 188 kt CO₂e, or 29.0 percent, below BAU levels in 2030. The long-term goal is to achieve zero emissions by 2050.

- *How does Seychelles plan to meet its emissions reduction target?*

A. Clean energy plans

12. Seychelles' mitigation plan envisages cutting emissions by: (i) a shift to solar energy, in amounts eventually large enough to supply most public electricity; (ii) switching 30 percent of private vehicles to electricity; and (iii) capturing landfill methane (see text table 2). The NDC includes the calculations used to verify that

Table 2. Cost of Priority Mitigation Options for Seychelles' NDC

Sector	Mitigation action	Cost, US\$mn
Public electricity	90 MW of solar PV (capital expenditure and operation and maintenance cost over 20 year lifetime)	191.7
Waste management	Retrofitting landfill (Providence 1) methane capture and flaring equipment	20.8
Land transport	30% of private in-use vehicles are electric by 2030	66.7
	15.8 MW of solar PV for meeting the energy demand of electric vehicles	29.8
Total		309

Source: Seychelles' NDC.
Notes: Assumed capital costs for solar PV are \$1.75 million per MW and operations/maintenance costs are \$19,000 per MW per year. Electric cars are assumed to cost \$10,000 more than their traditional fuel equivalent (and a projected 6,667 of them are needed by 2030).

this strategy would be adequate to achieve the emissions reduction.

13. The plans have already got underway, in the sense that Seychelles has begun to install solar energy, with the help of the GEF, and electric cars receive substantial tax relief.

However, the scope of the plans is ambitious relative to the starting point. For instance, Seychelles has a policy of openness to solar energy sales to the electricity grid, but will have to undertake large investments to stabilize the grid before solar energy supply could become as pervasive as envisaged in the NDC plan; moreover, it is not clear that technology is yet adequate to handle the energy storage needed. And, while the authorities report keen interest by private investors in commercial aspects of solar energy, the enabling investments will have to be financed by the government. Likewise, the mission listened to a heated debate about whether electric cars are adequate to handle Seychelles' mountain gradients and stop-start traffic.

14. There would be many side-benefits to meeting the targets; notably, they would give Seychelles energy security and significantly reduce its imported fuel bill. Hence, the conclusion for now must be that the strategy is worthwhile but the goals ambitious and the outcome uncertain.

B. Carbon taxation and fuel subsidy policies

15. Since the feasibility of the clean energy strategy in the NDC remains to be tested, it would be valuable to support it by pricing carbon at a level high enough to encourage firms and households to reduce use of carbon-intensive fuels. This is in line with the IMF's advice internationally, which is to favor more efficient and cost-effective price-based instruments for achieving emissions-reduction goals. Operationally, appropriate carbon-pricing would be achieved by raising taxes on the main carbon-emitting tax bases, with complementary reforms to reduce subsidies.

16. Ideally, carbon would be priced sufficiently high to change behavior enough to curb emissions without other direct measures or promotion of any single technology. In practice, however, many countries are considering a mix of carbon-pricing and clean energy policies to achieve their emissions targets.⁹ The Government of Seychelles is already taking steps toward better carbon pricing with the 50-cent increase in fuel tax announced in the 2017 budget speech.

- *Does the current tax/subsidy system deliver appropriate carbon pricing?*

17. Current fuel taxes fall short of delivering appropriate carbon pricing—and some subsidies in the system create additional distortions.

⁹ By end-2016, about 40 regional, national, and subnational carbon-pricing instruments had been implemented, with China planning to follow in July 2017. This figure includes emissions trading systems as well as taxes.

- *Carbon tax base.* In Seychelles, power generation is the largest source of emissions. Fuel oil (mainly used by PUC) accounted for 50 percent of emissions in 2015, and diesel (used by PUC, hotels, and some vehicles) for 35 percent. Motor gasoline accounted for 13 percent.
- *Current carbon-related taxes.* As shown in table 3, power generation is lightly taxed, with fuel oil and diesel used by PUC taxed at 50c per liter, while diesel for hotel generators is taxed at 4 rupees per liter. Road fuels—meaning gasoline and diesel for vehicles—are taxed at 8 rupees per liter.¹⁰ As in other countries, LPG is lightly taxed, because it tends to be used by the poor for cooking. However, its high per unit distribution cost means that it is still one of the most expensive fuels (see figure 1 below).

Table 3. Fuel Tax Rates and Revenues, 2015			
Product	Consumption, liters	Gross revenue, Rs million	Effective excise, Rs/liter
Gasoline	25.2	201.3	8.0
Diesel	53.9	308.5	5.7
Power	9.6	8.6	0.5
Hotels	13.2	105.2	4.0
vehicles	31.1	189.1	8.0
Fuel oil	75.4	36.0	0.5
power	71.7	34.2	0.5
other (brewery)	3.8	1.8	0.5
Jet fuel	2.9	23.2	8.0
Avgas	0.0	0.1	2.0
Kerosene (maritime and aviation)	0.1	0.6	8.0
LPG (cooking)	4.5	2.2	0.5
Lubricants	0.8	1.5	1.9
Total/average	137.6	573.4	4.2

Source: MOFTEP.

Note. Revenue is defined prior to rebates for (partially or fully) exempt fuel use.

- sides the tax preference for electric power generation, some other tax-subsidies are Beattached to the system. Notably, while there is no special fuel tax regime for public transport, fares are capped at a fixed unvarying charge at below cost, with a government transfer to compensate SPTC. Likewise, fuel for fisheries is rebated.

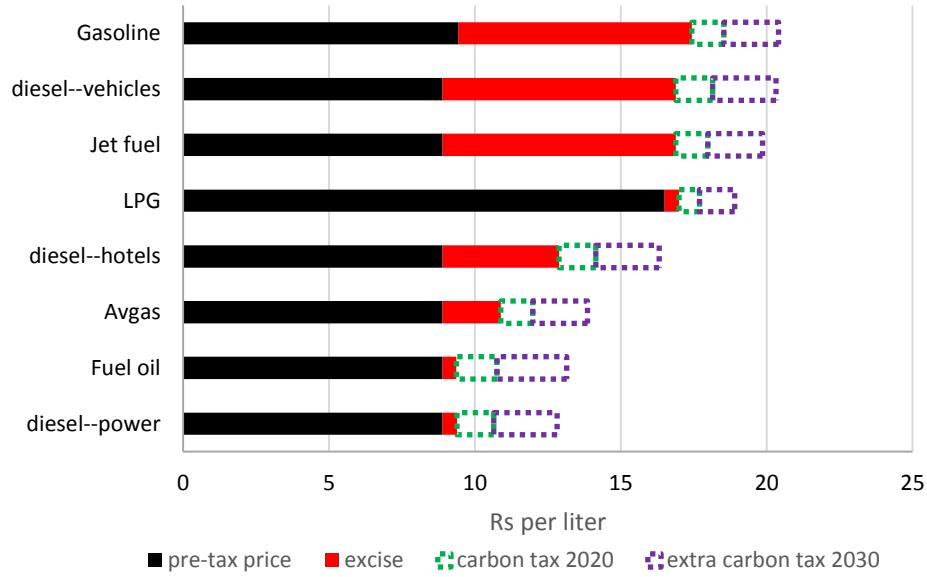
¹⁰ Not including the planned 50c increase in the 2017 budget (which has not yet been passed).

- Vehicles are taxed by engine size (which is a proxy for emissions, but a poor one), with hybrids paying substantially less than the normal excise and electric vehicles receiving even larger tax relief. The extremely favorable rate for hybrids has inspired a sharp jump in car imports, which has at least partly offset the emissions savings from switching to hybrids.
- *What would Seychelles' tax system look like with recommended carbon pricing?*

18. **Seychelles could shift gradually to recommended carbon pricing with relatively tolerable increases in fuel taxes, as long as the burden is spread across all sources of emissions.** Figure 1 below shows the impact of increasing fuel taxes gradually across the board, to reach a carbon price of 1,260 rupees per ton by 2030. The tax increase on products would be around 1 rupee per liter by 2020, and between 3.0 and 3.7 rupees per liter for different petroleum products by 2030, compared with pre-budget 2017. In other words, for road fuels, the proposed 50c increase in road fuel taxes would put Seychelles well on the way to meeting the 2020 milestone. However, the mission also strongly recommends an extension of the tax to fuels for power generation, since that is the source of the majority of emissions. The increase proposed in Figure 1 still keeps fuel oil and power-diesel cheaper relative to other fuels—in line with the authorities' policy preference for keeping down electricity prices. But since this leaves intact an untargeted subsidy, the mission also recommends increasing electricity tariffs at least to cover marginal generating costs (and using some of the gain to compensate those least able to pay).¹¹

¹¹This recommendation is not shown in figure 1, since it is not an intrinsic part of the proposed carbon tax reform.

Figure 1. Current Fuel Prices Augmented by Proposed 2020 and 2030 Carbon Tax



Source. IMF staff estimates.

19. **An important reason to bring in a carbon tax is that, the more successful the environmental gains, the lower the revenue from fuel excises—unless replaced by new taxes.** The mission estimates that, even without any mitigation policies, fuel taxes could decline by 2 percent of GDP by 2030, given likely improvements in energy efficiency and vehicle stock growth lagging GDP. Success of the mitigation policies in the NDC would imply another 1 percent of GDP loss of revenue, unless new taxes were brought in, say, on solar energy and electric cars to compensate the loss of fuel excises. A carbon tax at the rate proposed above would stabilize revenue, and by 2030 somewhat increase it, by around 1.6 percent of GDP.¹²

20. **The current vehicle tax system suffers from the same problem: the more successful the environmental gain, the worse the revenue loss.** A shift in the design of vehicle taxation to an ad valorem tax combined with ‘feebates’ could preempt this problem: a uniform ad valorem rate could be chosen to meet fiscal needs, with a sliding scale of surcharges or rebates for cars with above/below average emissions. Denmark, France, Mauritius, Netherlands and Norway have already shifted to such a tax mechanism.

C. Other carbon pricing strategies

- *What other carbon-pricing strategies could usefully contribute to mitigation?*

¹² The carbon tax would also shrink as mitigation efforts progress successfully, but its broad base would help compensate, as would the proposal to gradually raise the rate.

21. **Carbon taxation is probably the only practical way for Seychelles to price carbon.** An alternative to a carbon tax would be an emissions trading system (ETS). Under an ETS, emissions sources are required to acquire allowances to cover their emissions, the government caps the total quantity of allowances (and hence emissions), and trading for allowances amongst firms establishes a market price for allowances (and emissions). However, an ETS would not be feasible for Seychelles given the inadequate size of trading markets—unless it could find other partners.

D. Other macro-relevant policies for mitigation

- *Are any further large-scale mitigation policies relevant to Seychelles?*

22. **Landfill is responsible for 5 percent of Seychelles' emissions, and the NDC mitigation strategy envisages containing it.** Solid waste management is a mounting problem for Seychelles' 93,000 inhabitants and 300,000 tourists, who generate about 65,000 tons of waste per year on an upward trend. The design and implementation of a national solid waste management strategy, incentivizing waste reduction and recycling and promoting the involvement of the private sector, has become a priority for the Government. Landfilling produces negative environmental externalities: besides the problems of greenhouse gases and leachate, it is also a bad option for Seychelles because it occupies scarce land. Reducing emissions from the landfill is among the mitigation priorities of the NDC, which identifies a flaring project budgeted at \$21 million—for which the financing has not yet been identified. Price-based policies have also proven effective to contain waste, and could usefully be brought in to supplement the NDC strategy: for instance, 'pay-per-bag' trash schemes and deposit refunds for hazardous waste.¹³

23. **Steps to address congestion would be complementary to the carbon tax measures in keeping traffic sustainable.** An electronically collected congestion fee (modelled on other cities) could effectively manage road congestion in Victoria and, in the longer term, nationwide mileage tolls are a promising way to stabilize transportation revenues and manage pressure on road networks.

Recommendations for mitigation

1. Gradually introduce a carbon tax, to achieve a carbon price of 360 rupees per ton by 2020, and 1,260 rupees/ton by 2030. This should be applied across the whole carbon tax base (power generation as well as road fuels).

¹³ Experience of other countries suggests that these should not be seen as revenue-enhancers, given their administrative costs; the goal would be for the schemes to break even financially, while realizing the environmental gains.

2. Raise electricity tariffs to cover marginal costs.
3. Change vehicle taxation to an ad valorem rate plus 'feebate' system.
4. Consider price incentives to reduce waste (such as 'pay-per-bag' trash schemes and deposit refunds for hazardous waste).
5. Explore congestion fees or tolls to keep traffic sustainable (and support revenue).

ADAPTATION PLANS

Plans for adaptation to climate change are a work-in-progress, with additional reforms likely to be needed. All adaptation activities in the NDC will probably require public funding.

- *Has Seychelles developed an adequate strategy to adapt to climate change?*

A. Public investment plans

24. The NDC is relatively well-developed (compared with the contribution of other small states) in that it provides an outline of the planned investment framework for adaptation.¹⁴

It identifies areas of key vulnerability—critical infrastructure, tourism and coastal management, food security, biodiversity, water security, health and the blue economy—and lists priority adaptation investments for them (although with little detail). The total cost of these investments is estimated at US\$295 million, but the NDC does not specify a timeline for implementing them. They all appear to have an important public good component, which makes it less likely than for mitigation investments that they will elicit private investor interest. The NDC emphasizes that the impacts of climate change on Seychelles are uncertain and stresses the need for additional research and monitoring.

- *What, if anything, is missing from the adaptation investment strategy?*

25. The NDC costings are likely to be a lower bound to eventual estimates of adaptation needs.

Sectoral plans, when completed, should provide more precision about needs, but are also likely to expand the list of priority investments.

- **The case of Fisheries & Agriculture—one of the key sectors with a quantified investment plan already articulated—is a good illustration.** The Seychelles National Agriculture

¹⁴ The 2012-2020 Sustainable Development Strategy (Chapter 12) sets strategic goals to guide adaptation until 2020 with a proposed budget of US\$1.5 million, but without an investment plan.

Investment Plan (SNAIP, 2015-2020) provides a development strategy and investment plan for agriculture and fisheries. The SNAIP aims at making the sector resilient and plans for adaptation measures through the lens of climate-smart agriculture. The related budget amounts to \$128 million over the six-year period, of which \$86 million will be covered by the government and by external partners' existing funding and pipeline commitments. The financing gap for 2015-2020 is therefore \$42 million. We estimate that roughly 50 percent of the investment plan (say, \$64 million) fits under the heading of adapting the sector to climate change. This is nearly twice as large as the NDC provision of \$35 million for 'Food Security' (the category with activities consistent with the climate-eligible projects in the SNAIP).

- **Notably, the strategic role of the blue economy is not reflected in the NDC.**¹⁵ Published before the blue economy became a cornerstone of Seychelles' development strategy, the NDC does not give it much importance, only listing as an adaptation action \$15 million to set up a marine resource management institution. However, Seychelles now envisages a far more proactive strategy to adapt the blue economy to climate change, building its resilience by strengthening the management of fisheries and marine ecosystems, and expanding the coverage of marine protected areas. Using a combination of internal and external financing, including two innovative financing mechanisms—a debt-for-adaptation restructuring¹⁶ and a blue bond¹⁷—it expects to cover financing needs for fisheries management until 2023 while paying only a fraction of the costs related to the expansion of the protected areas network.¹⁸ The Blue Economy Roadmap to be published before end-2017 will mainstream climate change and detail the related investments.

¹⁵ Seychelles defines the blue economy as the economic activities that directly or indirectly take place in the ocean and coastal areas and/or use outputs from the ocean, and the contribution of those activities to economic growth, social, cultural and environmental wellbeing.

¹⁶ The debt restructuring supported by The Nature Conservancy in 2016 reduces the cost of part of the debt Seychelles owes to its Paris Club creditors. In turn, it allows Seychelles to fund marine conservation and climate adaptation with the cost difference. These funds are channeled through a sinking fund, for immediate measures, and through an endowment fund that will ensure a sustainable financing stream in the future.

¹⁷ The government will issue a US\$15 million Blue Bond with the support of the World Bank to finance Seychelles' blue economy objectives of environmental sustainability and economic diversification. The GEF Non-Grant Instrument Pilot will be used alongside an IBRD guarantee to lower the cost of this Blue Bond, ideally down to the 3 percent range. See Annex I for more detail.

¹⁸ The country will have access to approximately \$500,000 per year until 2023 to finance the expansion of the protected areas network and is currently undertaking an assessment of the related budgetary needs. Balmford et al. (2003) found that the annual cost of running a marine protected area network ranges from US\$4 to nearly US\$30 million per km² (median, US\$2,698 per km²). For Seychelles, which pledged to protect 420,000 km², and using the minimum value, this would translate into a minimum annual cost of US\$ 1.7 million.

26. **The other sectors flagged in the NDC for priority adaptation actions lack sectoral strategies mainstreaming climate change, and their NDC priorities and budget are a rough estimate.** Clearer investment plans would allow Seychelles to better identify financing gaps.

- **Water.** Protection of the vulnerable water sector is the greatest share of the NDC adaptation budget (\$85 million or 29 percent). The main investments increase the capacity of the La Gogue dam (approximately \$20 million), extend the sewerage network and build water infrastructure in the agricultural sector. A significant part of these projects is either underway or financed, but is difficult to identify in the PSIP.
- **Critical infrastructure.** The total amount the NDC allocates to the adaptation of critical infrastructure is \$70 million. Considering that most of Seychelles' critical infrastructure is on the shore, including the main roads, the main cities, the airport, the ports, the power and sewerage plants, and most hospitals and schools, the cost of climate-proofing this infrastructure could be several orders of magnitude greater. A more precise assessment of this cost, based on past events, climate modeling, and cost benefit analysis, would be valuable for estimating the underlying financing gap.
- **Health.** Climate change will affect the occurrence of diseases in Seychelles, and a few recent crises (e.g. dengue fever) signaled the need to adapt proactively. The NDC lists adaptation investments in health of \$30 million but is vague on the specific investments to be undertaken. The Ministry is finalizing a sectoral strategy that will mainstream climate change in the health sector.
- **Tourism.** Tourism is addressed in the NDC under the headings of coastal management and disaster risk management, two areas important for tourism but encompassing most of Seychelles' economy. The NDC does not list investments specific to adaptation of the tourism sector. Since tourism is the largest sector, it would be relevant to include a more detailed discussion in the next version of the NDC. The Tourism Master Plan 2012-2020 addresses climate change, but mostly in terms of reducing the environmental footprint of the sector.

B. Other public programs (regulation reform, zoning...)

- *Adaptation isn't just a matter of investment spending; what regulations support it?*

27. **Land use planning is needed for many projects listed in the NDC and is seen as an important tool for adaptation to climate change.** For instance, the current moratorium on building big new hotels is intended to protect sustainability in the face of coastal erosion and pressure on energy, food, and water. Seychelles has a well-established legal framework for land use, the Town and Country Planning Act. Land use is guided by the 2015 Seychelles Strategic Land Use Plan, which is intended to steer land use planning until 2040. However, according to the government, the Plan does not adequately address sea-level rise and storm surges, the two main

climate change impacts on infrastructure. Even though restricting land use for fear of flooding is difficult given the scarcity of land, a more protective update is called for.

C. Financial sector preparedness

- *How is the financial sector contributing to the climate change effort?*

28. **The financial sector has not been much involved with the climate change strategy, and awareness of issues is relatively low.** The influential view put forth by Mark Carney, Governor of the Bank of England, that the financial sector can play a significant role in supporting adaptation to climate change—both by mobilizing innovative financing and by being a positive force in disaster preparedness—has not yet got traction in Seychelles.¹⁹²⁰ In the context of a small economy like Seychelles, safeguarding access to credit for households and businesses, and promoting a resilient mobile banking platform, could facilitate recovery after a natural disaster.

29. **While the central bank was consulted on the debt swap and the blue bond, the banking system does not generally participate in innovative financing.** Some commercial banks may have infrastructure in their loan portfolio but in general there is not much awareness of this type of lending opportunity. Nonbanks do not participate in big-project financing in Seychelles.

30. **On the disaster-preparedness side, the central bank explained that it is not included in DRDM's emergency planning.** However, the central bank and FSA share a business resumption site and both banks and nonbanks are required to have business resumption plans.

31. **As regards having available financial buffers, the central bank holds four months in gross reserves.** These are deemed to be more-than-adequate (for normal circumstances), according to the IMF's reserve metric (they amount to about 175 percent of the metric for reserve adequacy for floating exchange rate regimes), and broadly adequate taking into account also the smallness of the economy. Seychelles also has, as an additional buffer, the central bank's ability to give within-year advances to government, which could significantly facilitate short-term financing in the wake of a disaster.

Recommendations for adaptation

1. Clarify the details (projects and timing) of the adaptation proposals in the NDC.
2. Use completed sectoral strategies to identify additional adaptation needs (for instance, in the SNAIP or the Roadmap for the Blue Economy)—and include these in the NDC update.

¹⁹ <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>

²⁰ See also *After Paris: Fiscal, Macroeconomic and Financial Implications of Climate Change*, Farid et al, IMF (2016).

3. Clearer investment plans would help Seychelles identify financing gaps, especially in frontline areas: water, critical infrastructure, health, and tourism.
4. Update the Seychelles Strategic Land Use Plan to adequately address sea-level rise and storm surges.

Table 4. Seychelles NDC 2015--Costed Climate Change Projects

		10	%GDP
Total		604	40%
	Mitigation	309	20%
	Public Electricity		
	90 MW of solar PV	191.7	13%
	Waste Management		
	Retrofitting landfill for gas capture and flaring	20.8	1%
	Land Transport		
	30% private vehicles electric by 2030	66.7	4%
	15.8 MW solar PV for electric vehicles	29.8	2%
	Adaptation	295	19%
	Critical Infrastructure		
	Adaptation mainstreamed in all sectors with critical infrastructure; planning process; building codes; enforcement; community resilience	70	5%
	Tourism/Coastal Management		
	Coastal rehabilitation and resilience; cut vulnerability to flooding, landslides; strengthen early warning and capacity; improve co-management of sector by agencies	45	3%
	Food Security		
	Innovative technologies in food supply and value chains, skilled human resources, integrated with Blue Economy and Seychelles Strategic Plan 2015	35	2%
	Biodiversity		
	Fully implement Biodiversity Strategy and Action Plan, and Biodiversity Law; fully bio-secure border	15	1%
	Water Security		
	Fully integrated approach addressing ecosystem health, waste management, water treatment and supply, sewage, agriculture; increase storage by building dam; improve water management	85	6%
Health			
	Sector able to respond to population increase and climate-related health burden (e.g., dengue); exploration of science/technology innovation	30	2%
	Blue Economy		
	Set up marine resource management institution	15	1%
	<i>Memo: GDP 2017 (US\$, million)</i>	1,516	100%

FINANCING STRATEGY FOR MITIGATION AND ADAPTATION PROGRAMS

Seychelles has moved forward to mobilize financing for climate-related projects, but—given limits to public debt sustainability—success is likely to depend on capacity to bring in the private sector. Innovative financing is helpful but should be cost-effective.

A. Current state of financing

- *Does Seychelles have adequate financing to meet the needs of its climate change strategy?*

32. **The financing needs for capital projects identified in the NDC amount to 40 percent of 2017 GDP** (see Table 4). If assumed to be spread over 13 years between 2017 and 2030, this would imply investment and funding needs of around 3 percent of GDP a year. This compares with ‘normal’ budget capital spending of 6-7 percent of GDP, implying a substantial but not extreme addition (not all of which would be net). As discussed below in more detail, such a scaling-up would be likely to be consistent with debt sustainability, depending on financing terms and other circumstances.

33. **At the time of the 2017 budget, climate change projects amounting to 3½ percent of GDP had been included in the 2017-19 PSIP**—meaning that funding has been identified and the project authorized or underway (see Table 5).²¹ So far, thus (since these are multi-year projects), the pace of mobilizing climate-investment is slower than consistent with completing the NDC package by 2030—i.e., faster investment would be called for in future years.

34. **Funding for the projects in the PSIP is slightly more than half domestic, and slightly less than half foreign (almost all concessional).**²² Going forward, the government expects to be able to mobilize significant private investment to help finance the mitigation targets. However, the nature of the adaptation projects makes them less likely candidates for private investment, so official financing is likely to be needed for almost all.

- The blue bond being mobilized by the government with the World Bank and the GEF to finance fisheries adaptation is described in detail in Annex II. The US\$15 million bond will be a sovereign obligation of the Government of Seychelles, so it will need to be counted within the envelope for official financing.²³ However, the combination of the sovereign

²¹ This comparison, and Table 5, should be re-verified; it is possible that climate-change projects in the PSIP have been omitted, or that PSIP projects have been wrongly tagged as climate-related.

²² The PUC foreign loan is not identified in the PSIP as concessional.

²³ The bond amounts to 1 percent of GDP and the total project to 1.6 percent of GDP (US\$25 million).

liability with a World Bank guarantee and a substantial GEF grant is expected to make the bond attractive to a new class of private investors while keeping it affordable for Seychelles.

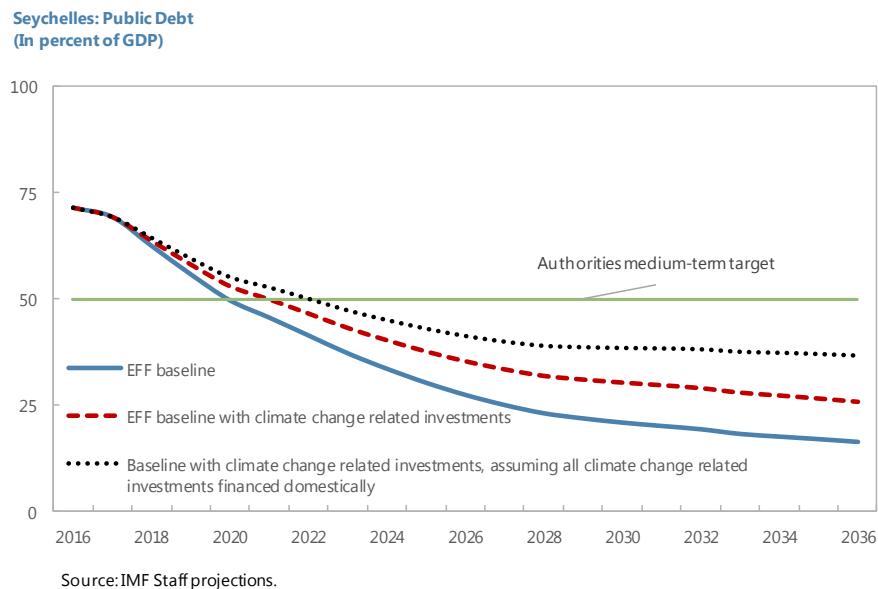
Table 5. Seychelles--Climate-Related Projects Identified in the PSIP			
	<i>total cost of project (multi-year, in % 2017 GDP)</i>		
	total	govt	foreign
Total	3.4	1.9	1.5
La Gogue Dam	1.8	1.5	0.4
Dept.Infrastructure	0.1	0.1	
Land Transport Auth.	0.02	0.02	
PUC	1.8	1.4	0.4
SWIOFISH3	0.1		0.1 <i>WB</i>
MEECC climate budget	0.6	0.1	0.5 <i>GEF grant</i>
Solar PV	0.9	0.3	0.6
MEECC	0.1	0.0	0.0
SEC	0.2		0.2 <i>India</i>
PUC (Romainville)	0.6	0.2	0.4
<i>Memo: GDP 2017 (rupees million)</i>		20,013	

35. **The discussion above leaves aside the point raised in Section V above—that the current NDC probably understates eventual adaptation needs.** It also does not include the CatDDO, although mobilization of contingency financing is an extremely valuable contribution to the bill for climate change (valuable not only because of the money involved, but also because it shifts the burden of assuring the resources forward to a non-crisis time). Future exercises should attempt to construct a more comprehensive financing needs envelope, to make a better assessment of the potential macro-economic impact of paying for climate change.

B. Consistency of climate change spending and financing plans with fiscal and external debt sustainability

- *Are Seychelles' climate changes plans consistent with fiscal and external debt sustainability?*

36. **Implementation of planned mitigation and adaptation investments would delay the achievement of the authorities' medium-term public debt reduction goal but debt would remain on a sustainable path.** A gradual implementation of climate-related investment (meaning a net increase of 1-2 percent of GDP annually—the 3 percent gross needs, with the impact partly offset by lower 'other' public capital formation), financed equally by external project grants, concessional external project loans, and domestic loans would keep the debt on a firmly declining path. Under this scenario, the public debt declines each year and falls below 50 percent by 2022, two years later than the authorities' target (see Figure below). Real GDP growth is assumed to be 1 percent of GDP higher from 2025 on, thanks to more efficient energy infrastructure and greater resilience to natural disasters.²⁴ The debt is projected to reach around 26 percent of GDP by 2036, a reasonably low level though significantly higher than under the baseline without investment scaling-up (15 percent).



37. **The type of financing used to fund the NDC investments will have an important impact on the debt path.** In a variant of the scenario above which has all the climate change-related investments financed domestically, the debt to GDP ratio would decline at a much slower pace, reaching around 37 percent in 2036. In other words, the availability of concessional external

²⁴ This assumption is founded on empirical work by McIntyre et al, *Caribbean Energy: Macro-Related Challenges*, WP/16/53, IMF (2016). See footnote 28.

sources to finance NDC investments would make a material difference to the eventual debt burden. Further, the impact on the debt dynamics could also be reduced by making effective use of Public Private Partnerships (PPPs). But also, as discussed later in the paper, strengthening of capacity to manage both public investments and PPPs is likely to be a prerequisite for realizing efficiencies.

C. Other macro-considerations

- *Would implementation of the climate change plans have any (good or bad) spillover effects to the macro-economy?*

38. **It is evident that the climate change agenda is intricately intermeshed with other developmental activities.** This is appropriate, given that successful climate-change management will be a near-prerequisite for meeting the SDGs, especially in small states.²⁵ An analysis of all of the interlinkages between climate-related projects and other activity goes beyond the scope of this report. But some macro-effects are important to flag for the analysis in this paper (and, if they begin to materialize, should be reflected in an update to the debt sustainability analysis above):

- **Balance of payments.** Success with the mitigation effort—in particular the strategy of shifting to renewable energy—will substantially reduce Seychelles’ import bill and economize on foreign exchange (i.e., support the exchange rate). At current low oil prices, the net oil import bill is slightly less than 2½ percent of GDP; during the height of the oil price boom, it came to more than 5 percent of GDP. Thus, improvements in energy self-sufficiency are a valuable investment in the economy’s future macro stability.
- **Revenue.** As discussed in Section IV above, changes in energy use could hurt budget revenue, in the absence of a change in tax design. Under the current fuel and vehicle taxation system, success with the mitigation strategy would likely imply a loss of 3 percent of GDP in revenue (which is an additional reason for implementing a carbon tax and reforming the vehicle tax in such a way as to maintain more stable revenue).
- **Growth.** An exercise done for Caribbean small states estimated that energy investment that improves energy efficiency could materially improve GDP p.c. in small states.²⁶
- **Possible overheating.** Seychelles has remarkably full employment, compared with other small states. Hence, if investment happens to scale up fast, inflation and over-heating cannot be ruled out—and the macro-authorities should stand ready both to smooth the pace of investment and to take other offsetting fiscal or monetary action as needed.

²⁵ But nonetheless, going forward it will be helpful if climate-related activities can be identified separately in the budget, PSIP, and other documents.

²⁶ An improvement of 1 percent in energy efficiency was found to be accompanied by an increase in GDP per capita by 0.2 percent in the long run. And an increase in 1 percent of gross capital formation per capita was associated with a 0.15 percent increase in long-run GDP per capita. See McIntyre et al., IMF (2016), op. cit.

D. Institutional issues

39. **The government has taken important measures to strengthen financing capacity.**

Success in maintaining fiscal sustainability while carrying out the climate change agenda will depend on the government's ability to mobilize concessional official financing and bring in private sector investors. It is building capacity to do this:

- **Organization.** It has set up a focused unit, the GoS/UNDP/GEF coordination unit, dedicated to mobilizing climate change funding and implementing donor projects. The unit has built up expertise in writing project proposals to climate funds and is in the process of preparing multiple requests. This should help Seychelles overcome the problem noted by many small states, of difficulties in overcoming hurdles to access climate funding.²⁷
- **Innovative financing.** Engagement with the World Bank on the blue bond, and previously with the Nature Conservancy and Paris Club for debt-for-nature swaps (see footnote 13), are building up valuable expertise in innovative financing.

40. **In both cases, however, the test of cost-effectiveness will need to be applied on an ongoing basis.** Care will have to be taken to ensure that climate fund financing is affordable:

- **Fees.** For one thing, the current system of requiring implementing agencies to prepare climate fund projects costs countries a reported 9.5 percent in fees; as the climate financing system becomes more mainstreamed, it will be in the interest of Seychelles and other countries to seek to economize on such fees.
- **Value-for-money.** Also, innovative financing packages will be worth constructing only if they are value-for-money or eliminate bottlenecks; care will be needed to avoid swapping an old liability for a new set of obligations that entail a new set of high costs.

²⁷ Going forward, climate funds should be more helpful in assisting small states to understand their processes and criteria. For instance, a recent application by Seychelles to NAMA was turned down without explanation, leaving the government with no guidance on how to access future NAMA funds.

Recommendations for financing

- Develop a comprehensive picture of financing needs, including contingency financing.
- To ensure continued fiscal and debt sustainability, rely as much as possible on private sector and concessional financing to execute the NDC.
- Success with the clean energy strategy should be high-priority, not least because it will strengthen Seychelles' balance of payments.
- However, care will need to be taken to offset any revenue loss from fuel and vehicle taxation—one reason a carbon tax would be valuable.
- Plan the execution of investments to be consistent with avoiding overheating/inflation, given Seychelles' near-to-full employment.
- As experience with mobilizing climate finance develops, seek to economize on the costs of accessing funds.
- Ensure that innovative financing packages offer value-for-money.

RISK MANAGEMENT STRATEGY

Seychelles has some key elements of a risk management strategy, but buffers should be increased and insurance should be developed.

41. **The challenge of financing climate change is not only one of raising donor or investor funds, but also of provisioning appropriately for the higher risks that accompany climate change.** The World Bank has developed a risk-layered framework for optimizing disaster financing.²⁸ It advises that countries should have in hand a mix of financial instruments that finance their contingent liabilities at lowest economic cost. In practice, this means that—having taken stock of their risks—governments should provision for the costs of small disasters themselves; moderate disasters will require financing beyond reasonably-sized domestic savings but can be pre-financed by contingent arrangement or insurance; only the largest disasters, for which insurance would be too expensive, should be left for financing to the unpredictable goodwill of the international community.

A. Risk assessment procedures (e.g., fiscal risk statement)

- *How well does Seychelles assess risk?*

42. **Seychelles meets formal standards for risk assessment procedures by including a short fiscal risk statement in documentation for the Budget Speech** ('Risks to the Budget').²⁹ However, risks are not quantified, and while the statement mentions natural disasters, it does so only in general terms. Over time, Seychelles should develop costing of tail events, and use this costing (e.g., the need to cover a moderate disaster) to guide its contingency budgeting.

B. Self-insurance (government financial buffers including contingency provisions, rainy-day funds, NIR ...)

- *To what extent does Seychelles self-insure against risks?*

43. **The budget includes an explicit annual contingency allocation of 25 million rupees** (0.3% of total government spending and 0.12 percent of GDP). It can be used for disasters, health crises, economic shocks, or emergency infrastructure needs. This allocation responds to a constitutional requirement for a contingency fund.

²⁸ See 'Financial Protection Against Natural Disasters: An Operational Framework for Disaster Risk Financing and Insurance', World Bank, 2014; also Seychelles' CatDDO program document (report no. 88264-SC), Box 2.

²⁹ See, for instance, *Small States' Resilience to Natural Disasters and Climate Change—Role for the IMF*. IMF Policy Paper, December 2016

44. **The contingency line is well-established (i.e., transparent and its role understood by other ministries) but is small compared with potential needs from a catastrophic event** ("the size of one government building"). Officials see supplementary allocations as the appropriate solution to higher immediate crisis needs, and believe these would be approved without delay. Nothing in budget legislation impedes this, and short-term central bank financing of the budget is possible in exceptional cases. However, they also commented that they are still struggling to provide funds for build-back three years after tropical storm Feeleng, despite international assistance.

45. **A larger fiscal buffer would be appropriate.** Seychelles is in a better position to respond agilely to disasters than many other small states, because of its budgetary flexibility and independent monetary policy. However, financing a large tail event would be incompatible with monetary and fiscal stability. And delays in rebuilding the capital stock can be a drag on growth. Hence this report recommends the re-establishment of a contingency fund. This could be built gradually, by saving the contingency allocation in the fund every year it is not drawn down.³⁰

C. Risk reduction and transfer (other insurance, pooling arrangements,)

- *To what extent does Seychelles transfer risk?*

46. **Seychelles has been innovative in some aspects of risk transfer but has left others unexplored.** It broke new ground by having the first small-state CatDDO with the World Bank. However, it has not joined the regional sovereign-level risk pool, the African Risk Capacity (ARC), which offers African countries, including island states, drought and cyclone insurance. Its domestic insurance sector is underdeveloped.

47. **The CatDDO is a contingency line of credit.** Seychelles signed a Development Policy Loan in 2014, with a Catastrophe Deferred Drawdown Option (CatDDO) of US\$7 million. This CatDDO is designed to provide liquidity in the case of medium-sized (or cumulative) disasters that cannot be funded with Seychelles' internal reserves and to provide bridge financing while other sources of funding are being mobilized in the case of major disasters. The Government may draw funds upon declaration of a state of emergency from a natural disaster. The Cat DDO has a revolving feature which allows amounts repaid prior to the closing date to be available for subsequent drawdown. The drawdown period is three years. While the CatDDO provides concrete protection to Seychelles, it does not substitute for the development of additional provisions. To put it in context, it would have fallen short of covering the cost of 2013 Tropical Cyclone Felleng (US\$ 8.4 million).

³⁰ If the fund became sizeable, consideration should be given to investing part or all of it abroad, to avoid pressure on the domestic banking system from a rapid drawdown of domestic deposits and to facilitate access to foreign exchange. See IMF (2016), Annex VIII, Design and Use of Government Deposit Buffers.

48. **On the side of domestic risk management, however, Seychelles lags: insurance could contribute more to risk management.** Seychelles has an underdeveloped insurance industry.

The government does not buy insurance. While hotels have mandatory insurance and bigger businesses have insurance, there is little offloading of private risk beyond vehicle and mortgage insurance. A small scheme for farmers ran into difficulties with an unexpectedly large payout in 2016 after heavy rains. This illustrates on the one hand, the value of such insurance in the face of uncertain weather, and on the other the need to overcome design challenges, such as adverse selection and a small population pool.

49. **An expansion of insurance could play a useful role in spreading risk.** In the short run, the government should consider making insurance mandatory for buildings in flood-risk areas, for protection and as a way of influencing incentives to find safer alternatives. In the medium term—and in the context of fast evolution of public-sector-focused products in the insurance industry—the government should explore the cost-effectiveness of insurance as a supplementary buffer, for instance, to insure key government buildings.

Recommendations for risk management

1. Over time, Seychelles should develop costing of tail events, and use this costing (e.g., the need for part-provisioning for a one-in-fifty-years event) to guide its contingency budgeting.
2. The contingency fund should be re-established. This could be achieved gradually, by saving the annual budget contingency allocation every year it is not drawn down.
3. Consider making insurance mandatory for buildings in flood-risk areas.
4. Over the medium term, explore the cost-effectiveness of insurance as a supplementary buffer, for instance, to insure key government buildings.

Box 2. Asset Management and Operational Aspects of a Contingency Fund¹

- Asset management: the goal is to ensure adequate liquidity is available to meet post-disaster spending needs without triggering sharp movements in prices of domestic financial instruments or the exchange rate. This suggests that fund balances should not be treated as a source of budget financing (or consolidated into the government Single Treasury Account) or be encumbered in any way. Instead, fund assets should be placed in a separate liquid government account at the central bank.
- Use of assets: It should be stipulated in law that fund assets may only be used to finance specific post-disaster recovery and rehabilitation spending, but which would be carried out under the auspices of the national budget. These assets should not be used to finance recurrent or ongoing expenditure for disaster prevention or mitigation, e.g., building or upgrading infrastructure to make it more disaster resistant, as this type of spending is predictable and best incorporated into the regular budget process).
- Spending authority: implementing agencies, either newly established or existing, would decide and execute post-disaster spending, and this authority would not be affected by the establishment of the fund. The fund would not have authority to spend unbudgeted expenditures.
- Spending from the fund should follow existing financial procedures during execution. This would entail the procedures for budget release, payment, accounting, reporting, and external auditing.
- The fund should not develop operating capacity. Planning and execution of projects financed by the CDRF should be executed by departments legally responsible for the type of facility being rebuilt.
- The fund should be on-budget: allocative efficiency, transparency, and accountability are all enhanced by treating dedicated funds on-budget.

¹ 'A Framework for Climate Proofing Investments and Post-Disaster Financing—Preliminary Considerations', IMF staff, 2013-12-1 (David Gentry)

NATIONAL PROCESSES

Seychelles has been upgrading institutional processes steadily over the past decade, but suffers from many of the same capacity constraints as other small states.

A. Integration of climate change into national planning processes

- *Have climate-related projects been mainstreamed into national planning?*

50. **The integration of climate change into national planning processes is a work-in-progress**, both because national planning processes are being strengthened and because attention will have to be paid to ensure the climate change objective can be identified within the processes. The recent creation of the Economic Planning Department within the MFTEP could be an enabler of this mainstreaming of climate adaptation in national and sectoral planning.

51. **As discussed earlier, national development objectives and climate change goals are closely aligned.** The challenge is to articulate the plans in costed operational documents. Ideally, all planning documents—be they national or sectoral—should include investment plans and financing gaps from which to extract climate-related investments.

52. **A comprehensive National Economic Development Plan, which builds on the SSDS, is in preparation for planned finalization by end-2017.** It risks being delayed because it should draw on costed sectoral plans, not all of which yet exist. Importantly, the Ministry of Fisheries and Agriculture already has a fully-quantified investment strategy (SNAIP); a Roadmap for Renewables is being prepared by the Ministry of Environment and Energy, and a Roadmap for the Blue Economy by the Vice-Presidency. A key remaining input (from the climate change perspective) would be a costed plan from the Ministry of Habitat and Infrastructure.

53. **A comprehensive Public Sector Investment Program (PSIP) already exists which is screened for consistency with national priorities** (see more below). There is no system for identifying climate-change-related projects in the PSIP. However, the PSIP is fully integrated with the budget, and the budget is being shifted to a program basis (now in pilot, and for full implementation by 2019). Climate change is already identified in some pilot programs, so what remains to be done is to ensure that climate change objectives and activities are systematically identified throughout the budget, and investment projects explicitly linked to these. This would be facilitated by the new Programme Performance-Based Budgeting currently being implemented by the government. Critical next steps would be strengthening procedures for determining government priorities by the Cabinet within a credible budget envelope, capacity building, and enhancing awareness of PSIP processes.

54. **Officials are conscious that the specification of sectoral strategies (as well as the reorganization of the government) may in some cases create a need to update legislation.**

For instance, the Energy Act will be reviewed for consistency with the energy strategy in the Renewables Roadmap and more broadly.

55. **As discussed earlier, on the adaptation side the NDC falls short of offering a comprehensive strategy, and a broader framework is needed.** But there is huge value in keeping the NDC aligned with the evolution of national strategies. Hence, in the next update, the revised NDC should put more emphasis on the blue economy and propose more accurate estimates of required investments across all sectors and in particular critical infrastructure.

B. Adequacy of public investment management system (effectiveness of procedures for identifying, evaluating, selecting, and implementing projects)

- *Are adequate public investment management systems in place, to ensure climate-related investments will be well-spent?*

56. **Yes, in principle; but before their effectiveness can be assessed, more experience is needed, and preferably capacity-building.** Seychelles has recently put in place many key elements of good public investment management (PIM). The PSIP is managed by the MFTEP, and is fully integrated with the budget. It is intended to be a fully comprehensive compendium of all government investments. A high-level Development Committee guides project selection for inclusion in the PSIP, based on cost-benefit analysis.³¹ Procurement is open and transparent. Finance Ministry officials monitor projects.

57. **The mission did an overview assessment of Seychelles' PIM practices using the IMF's evaluation tool, PIMA.**³² See Annex III. Some preliminary conclusions are:

Planning

- Seychelles does well in *aligning its public investment plans with fiscal targets*, anchored by the objective of reaching a debt/GDP ratio of 50 percent by 2020.
- Key for the effectiveness of planning will be to finish *sectoral plans with full costing*, and reflect priority projects in the National Development Plan.

³¹ The Development Committee includes the Minister of Finance, the Permanent Secretary for Infrastructure, the Special Advisor to the President, and outside experts.

³² The PIMA tool is a detailed questionnaire covering 15 aspects of public investment management (see <http://www.imf.org/external/np/fad/publicinvestment/#3>). The assessment described in the text was not a full PIMA evaluation, because it did not take stock of the effectiveness of the procedures, but used interviews to determine what has/has not been put in place.

- A step beyond that would be to specify *targets for outputs and outcomes* of the investments. This is envisaged as part of the shift to program budgeting.
- Seychelles is preparing for *PPPs*. A PPP Act has been presented to Cabinet, and the PIM unit in the MFTEP has been designated as the PPP unit. The Development Committee will scrutinize all PPP proposals (beyond a threshold size).
- Seychelles aims to have a *regulatory framework* which welcomes private sector investment in infrastructure, though with controls and Development Committee scrutiny of big projects. For instance, "IPPs are welcome, but proposals will be looked at carefully."

Allocation

- A strong point of Seychelles' PIM is that *capital spending is almost all undertaken transparently through the budget*, including foreign-financed projects. (The MFTEP cannot vouch that it captures all grant-funded projects, if other Ministries do not report them, and remarked that these unreported projects "are the ones that run into problems".)
- Seychelles does *multiyear planning*, but probably not far enough ahead: the PSIP has a three-year horizon. This means that ministries' investment ceilings are set only for three years, though the life of some projects may be longer. Also, appropriations are annual, which somewhat undermines the certainty associated with multi-year ceilings.
- The *current and capital budgets are presented together* (with clear distinctions between current and capital spending in line with international standards). Officials explained that appropriations are now made for recurrent costs of projects.
- *Cost-benefit analysis* is done for projects, according to a PIM manual (which is being updated). However, the Revenue and Expenditure Estimates 2017 note that "the Ministry of Finance has limited capacity to assess capital payment requests and appraise capital projects" (p. 122).
- The Development Committee serves as a *central review point for project selection*, taking a holistic perspective.

Implementation

- Seychelles does not have a system for *multiyear allocations of project funding*, or for *carryover*, but officials say that ongoing projects are given priority in annual allocations, and *no virements to current spending* are allowed.
- Most donor-funded projects are *integrated into the TSA* though some require dedicated accounts. Officials say cash is released punctually, with early release possible.
- The *procurement process* is transparent, requiring open tender, though the 2011 PEFA noted some difficulty in tracking the results of tenders.³³

³³ A PEFA update was done in 2016, but results are not yet published.

- Projects are *monitored by MFTEP officials* throughout, including on-site; however, the Ministry notes the need to build capacity in this area. There is no procedure for ex-post audit.

C. Adequacy of PFM systems for managing CC financing and outlays (transparent on-budget treatment of CC activities, multi-year budgeting, etc.)

- *Are adequate public financial management systems in place, to protect climate-related funding?*

58. **Besides the positive PIM practices identified above, Seychelles has some other protective features of its public financial management (PFM) system, listed below.** The 2016 PEFA update gave Seychelles a middle-grade B/C+ review, noting that reforms had generated improvements in 7 areas out of 31 compared with the 2011 assessment, so that three-quarters of indicators now 'more than satisfy the basics of good management of public finances' (p. 11), but with a D grade for donors' reporting to government on their project execution.

- There is a medium-term fiscal framework designed to contain spending within sustainable limits, consistently with achieving Seychelles' 2020 debt target of 50 percent of GDP.
- All borrowing has to be approved by the Debt Committee; grants, however, may be taken on by line ministries without Committee or MFTEP approval and their use may not be tracked.
- A single treasury account (TSA) covers 90-95 percent of government funds, with some dedicated donor accounts being an exception. Donors are identified in the chart of accounts.
- State-owned enterprises (SOEs) are not covered by the budget, but a regulatory body is responsible for oversight. SOEs must operate on a commercial basis unless a government directive allocates a subsidy to them.

Recommendations for national processes

1. Ensure that climate change objectives and activities are systematically identified throughout the budget, and investment projects explicitly linked to these.
2. Review legislation for consistency with sectoral strategies and update where needed (for instance, the Energy Act).
3. Pass the PPP Act.

4. Build capacity for effective public investment appraisal and monitoring, in MFTEP and other relevant ministries.
5. Amend the PFM Act to ensure all loans and grants go through the MFTEP and develop a policy of managing donor funding.

TAKING STOCK: PRIORITY NEEDS TO BE MET

Seychelles has been innovative and resourceful in specifying its climate change strategy and inspiring international interest. Full success with the strategy will require mobilizing private investment for bankable projects, providing government financing or external support for public goods, and building capacity to manage the ambitious plans effectively.

A. What resources does Seychelles need to mobilize, to achieve its climate-change strategy?

59. **An indicative tally of the priorities identified in this Assessment points to the following resource needs** (though this list is not intended to be exhaustive and will evolve with time and experience):

- **General preparedness (see Chapter III and Annex I for more detail)**
 - Completion of the disaster-preparedness strategy (financial support and capacity-building)
 - Integration of climate-related activities into costed sectoral plans (capacity-building)
- **Mitigation (see Chapter IV and Table 2 for more detail)**
 - Solar PV for public electricity, including for electric vehicles (US\$222 million in private investment)
 - Electric vehicles (US\$67 million in private investment)
 - Waste management (US\$21 million in private investment, and capacity-building)
 - Supporting quasi-public goods (primarily government financing or external support)
 - Strengthening the electricity grid
 - Charging stations for electric vehicles
 - Carbon taxation (follow-up capacity-building, especially to rationalize pricing of power and subsidies to fisheries, and possibly vehicle taxation and congestion pricing)
- **Adaptation (see Chapter V and Table 4 for more detail)**
 - Critical infrastructure (US\$70 million costed; significantly more expected to be needed but not yet costed; primarily from public/external funds—though private investment should be sought where a business case can be made)

- Tourism/coastal management (US\$45 million costed; significantly more expected to be needed but not yet costed; primarily from public/external funds—though private investment should be sought where a business case can be made)
- Food security (US\$35 million costed; more expected to be needed.... as for previous items)
- Biodiversity (US\$15 million costed; more expected to be needed ... as for previous items)
- Water security (US\$85 million costed; more expected to be needed ... as for previous items)
- Health (US\$30 million costed; more expected to be needed when costed sectoral strategy is completed ... as for previous items)
- Blue economy: (US\$15 million costed; significantly more expected to be needed when the Roadmap strategy is costed; private investment should be sought where a business case can be made, though the public good component will require substantial public investment/external funds)
- Land use (not yet costed but public funding is expected to be needed to address sea-level rise and storm surges)

National processes (see Chapter VII and Annex III for more detail)

- Further development of public investment management skills (capacity-building)
- Further strengthening of public financial management skills (capacity-building)

Annex I. Disaster Risk Management¹

60. **The vulnerability of Seychelles' island economy to climatic changes calls for urgent attention to strengthen resilience and response to natural hazards.** Increasing development and the trends of global climate change, coupled with the constraints and vulnerabilities inherent in being an isolated small island archipelago, dictate the need for building resilience to disasters at community, district and national levels. In Seychelles this is an increasingly important component of the national pursuit of sustainable development.

61. **The Government of Seychelles recognized the increasing threat of natural disaster and responded by setting up a National Disaster Committee (NDC) in 1997.** The NDC is a multisectoral body that functions as the "national platform" for coordination and policy guidance on disaster risk reduction. In 2006, the NDC secretariat was upgraded and established as the Division of Risk and Disaster Management (DRDM), which initially fell under the Office of the President and later under the Office of the Vice-President. It thus formed the operational body of the NDC and oversaw day-to-day and comprehensive implementation of the disaster management program. Since July 1, 2010, as a result of government restructuring, the DRDM now falls under the mandate of the Ministry of Environment, Energy and Climate Change (MEECC).

62. **The DRDM is responsible for coordinating the disaster risk reduction effort in Seychelles as well as the emergency response in the event of a natural catastrophe or manmade emergency.** The DRDM is also charged with executing the actions, regulations and directives towards the reduction of disaster impacts on human lives, goods and society. These actions include: planning, supervision, assessment, scientific research (risk mapping), information dissemination, education, public policy implementation and coordination of disaster risk management initiatives with all national and international organizations.

63. **In 2005, the government subscribed to the Hyogo Framework for Action (HFA) 2005–2015**, which has provided a sound, comprehensive framework for the preparation of national initiatives and programs to integrate disaster risk reduction across development sectors to develop and implement a comprehensive disaster risk management program in Seychelles. In 2011, a National Disaster Policy, directly linked to the HFA's five pillars, was developed to guide the country to achieve its objectives regarding disaster preparedness, management, response and recovery. It was updated in 2014 with the National Disaster Risk Policy.

64. **Enhanced preparedness and awareness have reduced vulnerability to disasters.** A new National Emergency Operations Center has been created and the government is currently developing a Master Plan for Disaster Risk Management. This plan, which builds on a multihazard

¹Prepared by B. Garnaud and the Disaster Risk Management Team of the World Bank.

risk assessment and contingency plans and strategies across sectors, is intended to be implemented across various sectors and by all stakeholders at various levels, from the national to community level.

65. The authorities are strengthening the technical capacity for disaster risk management and are working on putting a disaster risk financing strategy into place. These efforts will strengthen the government's capacity to respond to an adverse natural event, evaluate the impact of a disaster, and at the same time protect fiscal stability through risk-financing tools (risk sharing, risk pooling, contingent financing, and catastrophe-related bonds and insurance, for example). The country established two reserve/savings funds for more frequent disasters with lower magnitude, a National Disaster Relief Fund and a Budget Contingency Fund (the latter not currently in use; see section VII). Additionally, Seychelles is a member of the Southwest Indian Ocean Risk Assessment and Financing Initiative (SWIO RAFI) and as part of that program is initiating the process of developing a disaster risk financing strategy. In collaboration with the local insurance industry, the GoS has introduced an agriculture insurance scheme and is planning to set up an emergency assistance scheme for fishermen. Seychelles is an active participant in regional and international DRM forums, including the Indian Ocean Commission (IOC) and the United Nations International Strategy for Disaster Reduction (UNISDR). A comprehensive disaster risk financing strategy is needed to protect the country against both recurrent and catastrophic natural disasters, which will strengthen the government's ability to use funds effectively.

66. A Development Policy Loan from the World Bank, with a deferred drawdown in case of a catastrophe (CAT-DDO) was designed to fill part of the ex-post financing gap. It provides the government with a \$7 million contingent line of credit, triggered by declaration of a state of emergency. Its term was 2014-2017, but the government has expressed interest in renewing it for another three years, with an expansion to \$12 million. Under the DPL, the DRM framework was strengthened, although progress was deemed only 'moderately satisfactory', due to delays at the district level and in the Ministry of Health (both in the face of restructuring).

67. In sum, in spite of considerable progress, there is still work to be done to establish a full-fledged disaster risk management framework. Notably, the legal framework requires updating to provide the mandate and means to the DRDM to coordinate prevention and emergency response. The Disaster Risk Management Act of 2013 is currently being updated in that regard. To improve land use planning, hazard maps for cyclones, storm surge, rainfall, floods, forest fires, and climate change issues have been developed; however, they are not yet widely applied. Little information is available on multi-hazard risks, vulnerable areas, and historic and future impacts. While Seychelles made considerable progress to improve institutional capacity to engage in disaster risk management, there are still gaps in financial and staff resources and the technical and operational capacity of the agencies to implement a comprehensive disaster risk management and climate adaptation strategy.

68. **Reducing vulnerability to natural hazards and the impacts of climate change would require implementing the following measures:**

- Further strengthening risk-informed land use planning and sector development;
- Reviewing building codes for residential and commercial buildings and public assets (incl. buildings, drainage, transport infrastructure, utilities) and enhancing their enforcement;
- Further developing a Disaster Risk Financing and Insurance Strategy for the public sector and promoting increased insurance penetration for the private sector;
- Developing sector-specific and area-specific contingency plans;
- Further strengthening the hydro-meteorological network, and its monitoring and forecasting capacities;
- Enhancing early warning systems and emergency response;
- Further implementing coastal protection and other measures to mitigate coastal erosion;
- Increasing the urban resilience of Victoria;
- Capacity building, education and awareness among the population; and
- Enhancing the technological capacity to undertake effective research on climate change modeling and risks, monitoring of climate change impacts and implementation of adaptation measures.

Annex II. World Bank and Global Environment Facility Support to Blue Economy Resilience: The Swiofish3 Project and The Blue Bond¹

A. Sector and institutional context

69. **The fisheries sector is the second most important sector of the Seychellois economy.** Its annual contribution to GDP varies from 8 percent to 20 percent and it employs 17 percent of the total population. Fishing licenses fees provide the Government of the Seychelles (GOS) with a substantial source of revenue: during the year 2013, SCR 98.9 million and another €7.5 million as part of the sectoral support provided by the Fisheries Partnership Agreement with the European Union (EU) were collected. The Indian Ocean Tuna Factory is the largest single employer in the country with a workforce of over 2,500 workers. The fisheries sector is also of critical importance to the country's commercial balance; in 2012, the value of exports of consumable fish and fish products constituted 93 percent of the total value of domestic exports of goods.

70. **The sector can broadly be divided into three subsectors: (a) the artisanal demersal fishery, (b) the industrial and semi-industrial pelagic fisheries, and (c) the seafood processing industry.** Demersal fish live on or near the bottom of the sea. The main species targeted by the demersal fisheries are Bourgeois (emperor red snapper), Job (green jobfish), and Maconde (brown-spotted grouper). Pelagic fish live in open waters, neither close to the bottom of the sea nor near the shore. The main species targeted by the pelagic fisheries are yellowfin tuna, skipjack tuna, and bigeye tuna.

71. **The artisanal demersal fishery is of paramount importance to the Seychellois.** It is largely limited to the Mahé Plateau, an area of around 41,000 km² up to 50 m deep that comprises the islands of Mahé, Praslin, and La Digue and most of the population. The plateau is fished by 140 whaler- and schooner-type vessels and at least 400 outboard motor vessels, as well as sport and recreational fishing boats. These vessels go to sea for a day to a week and use hook and line and traps. The total annual landed catch amounts to more than 4,000 tons, valued at around US\$12.5 million, and supplies most of the domestic market. This supply is critical to the local tourism industry and to the food security of Seychellois. Seychellois have one of the highest levels of fish consumption per capita, approximately 57 kg per year, with fisheries products accounting for up to 50 percent of the total protein consumed.

72. **The industrial, and to a lesser extent the semi-industrial, pelagic fisheries account for the lion's share of the catch.** They are located offshore, in deeper waters, and involve significantly larger vessels: purse seiners and long-liners. In 2014, a total of 44 purse seiners were

¹ Prepared by B. Garnaud, World Bank.

licensed to fish within the Seychelles EEZ and reported a total catch of 280,000 tons of tuna, of which 20 percent from the Seychelles EEZ. The fleet is owned by foreign interests (mostly Spanish, French, and Korean). The second most important fishing for tuna catch is made by long-liners. In 2014, a total of 142 vessels were licensed to fish within the Seychelles EEZ, out of which 36 vessels were Seychelles registered. After a dramatic decrease in catches and the reaching of a record low of 1,343 tons in 2011, which is likely due to increasing Somalia piracy attacks in the region, the total licensed long-liner fleet recorded a catch of 7,400 tons in the EEZ in 2014, following decreasing piracy activities.

73. The Seychelles is a major seafood processing hub and intends to increase the contribution of the seafood industry to its blue economy. Port Victoria is the most important tuna hub in the Western Indian Ocean, with almost 250,000 tons of purse-seined tuna transshipped and landed in 2014. The Seychelles also hosts the second largest tuna canning factory in the world in capacity, the Indian Ocean Tuna factory. Additional, smaller processing plants target local and export markets. The GOS has placed the seafood industry at the center of its blue economy strategy and aims at progressively increasing the share of landed catch that is processed locally instead of being transshipped, targeting in particular bycatch and byproducts of the tuna industry. This strategy is, however, hindered by high credit interest rates, a poor business environment, and infrastructure bottlenecks.

74. There is increasing evidence that the pressures exerted by the fisheries and tourism sectors on the coastal and marine natural resources are reaching unsustainable levels. Declining catch rates of the main species of fish are worrying indicators of the health of the ecosystems. Most of these pressures come from overfishing in the artisanal, recreational, and sport fishing subsectors and from an increasing environmental footprint of the tourism industry. They are particularly acute on the Mahé Plateau, where the population and economic activity are concentrated. The fisheries are open-access, which impedes any action to limit the fishing effort and ensure their sustainability.

75. The unsustainable use of the marine environment is a major risk to the future of the Seychelles' blue economy. The country's comparative advantage lies in its natural capital and the tourism and fisheries sectors are overly dependent on the health of coastal and marine ecosystems. Depleting fisheries will rapidly lead to a loss of income for fishers and tourism operators and will jeopardize the local seafood industry and any future investment in the blue economy. It will also pose significant risk to nutrition and food security in the country, where almost all the fish that is consumed is fished locally. The substitution of protein in the local diet from fish to less healthy sources is expected to lead to nutrition and public health issues, including obesity and diabetes. It will also increase the country's reliance on imports. These impacts could be compounded by climate change, the effects of which are still uncertain for the Seychelles environment and economy and will require that stocks are managed with precaution to ensure their resilience.

76. **Faced with the need to preserve its comparative advantage in natural capital for the future generations, the GOS adopted an ambitious marine conservation strategy.** The country is currently protecting 55 percent of its land mass and 0.02 percent of its EEZ, under the administration of a number of different government institutions, parastatals, and nongovernmental organizations. The Seychelles pledged to protect 30 percent of its EEZ by 2020 and initiated a marine spatial planning exercise to serve as the foundation of its sustainable blue economy strategy. This marine spatial planning exercise started in 2015 and aims at improving the planning and management of the country's vast maritime space. It will progressively identify and gazette areas amounting to 15 percent of the EEZ to be protected as high biodiversity zones and another 15 percent to be protected as medium biodiversity zones, allowing for some sustainable economic activities—including controlled fishing. In parallel, but in the same framework, the Seychelles is also developing management plans for its nearshore fisheries, including the first fisheries management plan for the Mahé Plateau, with a view to progressively transition from an open-access fishery to a more controlled fishery. The Mahé Plateau fisheries management plan is currently being prepared and will follow a continuous improvement approach, focusing on easy-gain and priority species during the first years of its implementation and progressively moving to a more comprehensive coverage of the demersal fisheries.

77. **The management of Seychelles marine ecosystems and fisheries is hampered by insufficient financing, capacity, and incomplete legal and institutional frameworks.** The newly created marine areas will benefit from a constant and indefinite revenue stream of around US\$250,000 per year from an endowment fund created with the proceeds of a debt restructuring. The total available funding will not be sufficient to allow for the effective management of the marine areas and the fisheries of the Mahé Plateau, potentially making them theoretical initiatives and jeopardizing the achievement of their objectives. In addition, the enabling environment for marine resources management is weak and lacks human capacity, clear policies and strategies, and surveillance capacity. The knowledge of the environmental, social, and economic state of the fisheries is deficient and current capability for applied fisheries research is insufficient. While many of these constraints are recognized by the sector, they contribute to deficiencies in the management of small-scale fisheries and monitoring of the offshore tuna fisheries.

B. The SWIOFish3 project

78. **The Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3) is a US\$25 million project aimed to improve management of marine areas and fisheries and strengthen fisheries value chains in the Seychelles.** It will support the GOS in achieving its objectives of marine conservation and sustainable development of the blue economy. It will specifically address gaps in financing, capacity, and institutional frameworks to ensure a sustainable management of the identified sustainable-use marine protected areas (Component 1) and of the Mahé Plateau fisheries (Component 2). This will lay the ground for the sustainable development of the fisheries value chains and the improvement of the enabling

business climate (Component 3). The expansion of the fisheries value chain will be a key element of adherence and compensation for any restrictive measure implemented as part of the management of the marine areas. However, it will be decisive that strong fisheries management measures are in place while fisheries value chains are developed to avoid creating a price signal that will further increase the pressure on the fisheries.

79. **Component 1: Expanded sustainable-use marine protected areas (US\$4.15 million).**

The first component of the project will support the GOS in implementing its pledge to protect an increasing share of its maritime space. It will build on the marine spatial planning exercise that the Government is currently undertaking through a scientific and consultative process. This exercise will progressively identify 15 percent of the EEZ as medium biodiversity areas and another 15 percent as high biodiversity areas. The medium biodiversity areas will allow for some sustainably managed economic activities, including fisheries and tourism, will be gazetted as 'sustainable-use marine protected areas', and they will be the focus of Component 1. The high biodiversity areas will be managed under stricter protection and will be supported by a parallel project financed by the GEF and the United Nations Development Programme (UNDP). Component 1 will expand the coverage of sustainable-use marine protected areas by supporting their creation and the preparation of related management plans and specific regulations. It will also support the effective management of these sustainable-use marine protected areas through targeted investments in communication, capacity building, control and surveillance, environmental research and data collection, promotion of more sustainable practices, economic diversification, and transition to alternative livelihoods. A Blue Grants Fund will be created to strengthen the sustainable-use marine protected areas network.

80. **Component 2: Improved governance of priority fisheries (US\$4.15 million).** The second component of the project will have a greater focus on fisheries management at a national level. It will first support the finalization and the implementation of the Mahé Plateau and the Praslin fisheries management plans, the most important fisheries management instruments of the country. This will entail communication, capacity building, control and surveillance, environmental research and data collection, promotion of more sustainable practices, economic diversification, and transition to alternative livelihoods. In parallel, it will help prepare and implement other fisheries management plans, including for the sea cucumber and tuna fisheries at the national level, thus covering over 90 percent of the fisheries in value and volume. It will also reinforce the country's capacity to manage its sector through a review and update of the fisheries institutional framework, the preparation and implementation of a fleet management and development plan, the strengthening of the fishers association to enhance their participation in fisheries management, and the consolidation of the fisheries and environment statistics and monitoring systems. The Blue Grants Fund will also be used to strengthen the management of these fisheries.

81. **Component 3: Sustainable development of the blue economy (US\$16.0 million).**

Component 3 will help finance the sustainable development of the Seychelles blue economy and

support increased value addition in the aquaculture, industrial, semi-industrial, and artisanal fishing and processing sectors. It will strengthen the enabling environment for the seafood industry, in particular related to aquaculture, the port development process, and the sanitary monitoring, and facilitate the expansion of value chains and promote synergies with other value chains (for example, tourism). A Blue Investment Fund will be created that will finance private and public investments aimed at facilitating the implementation of the Mahé Plateau fisheries management plan and the transition from open-access to better controlled fisheries. These investments will include alternative business opportunities for fishers in the seafood value chain, the restructuring of fishing capacity, and the rebuilding of fish stocks. To avoid these investments creating a price signal that would increase the pressure on the resource, a list of acceptable projects has been developed that includes management prerequisites (for example, management plan operational).

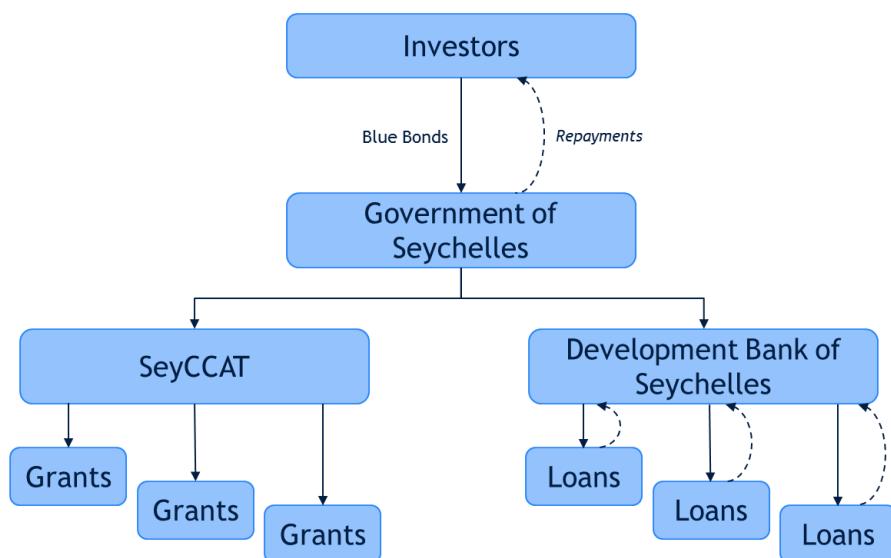
82. **Component 4: Project management and coordination (US\$1.0 million).** The last component will support the coordination and implementation of the project, through a Project Implementation Unit (PIU) and a Steering Committee.

C. Project financing and the Blue Bond

83. **The project will be financed through a US\$5 million loan from IBRD and a US\$5.3 million grant from the GEF, as well as the proceeds of the first Blue Bond.** The GOS will issue a Blue Bond for an estimated total of US\$15 million to finance part of SWIOFish3, in an innovative transaction that mobilizes capital markets to finance the Seychelles' blue economy objectives. The GEF Non-Grant Instrument Pilot will be used alongside an IBRD guarantee to lower the cost of this Blue Bond, ideally down to the 3 percent range. The use of the Non-Grant Instrument Pilot will take the form of a loan to the GOS with a 40-year maturity, a 10-year grace period, and a 0.25 percent interest rate. The Blue Bond is expected to have strong replicability potential for other borrowers in the future, by attracting investors to a new field and creating an affordable financing package for the country.



84. **The proceeds of the Blue Bond will follow two tracks.** Under the first track, the MFTEP will sign a Subsidiary Agreement with the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) whereby a percentage of the Blue Bond proceeds (notionally US\$3 million) will be transferred to SeyCCAT to establish a Blue Grants Fund. Grants will be made to public and private entities on a project proposal basis to fund activities related to the operationalization of sustainable-use marine protected areas, the implementation of the Mahé Plateau fisheries management plan, and the transition from open-access to better controlled fisheries. Under the second track, the MFTEP will sign a Subsidiary Agreement with the Development Bank of the Seychelles (DBS) whereby a percentage of the Blue Bond proceeds (notionally US\$12 million) will be transferred to the DBS for the establishment and management of a Blue Investment Fund. Commercial loans will be made to projects consistent with the provisions of the Mahé Plateau fisheries management plan and with a specific focus on economic diversification and sustainability. While the Blue Investment Fund will be capitalized by the Blue Bond proceeds, the repayment of the Blue Bond is considered an obligation of the GOS and will not be linked financially to the Blue Investment Fund.



ANNEX III. Pima Institutional Questionnaire—Interview Responses From Seychelles¹

I.	Planning	Seychelles
1.a.	Is fiscal policy guided by one or more permanent fiscal principles, or rules?	No fiscal rule, but debt target binding
1.b.	Do fiscal principles or rules protect capital spending over the short term or medium term?	no
1.c.	Is there a target or limit for government liabilities, debt, or net worth?	Debt target
2.a.	Does the government publish national and sectoral strategies for public investment?	Yes; being updated
2.b.	Are the government's national and sectoral strategies or plans for public investment costed?	This is underway
2.c.	Do sector strategies include measurable targets for the outputs and outcomes of investment projects?	Intended, when program budgeting reform is complete
3.a.	Are there limits on subnational government (SNG) borrowing?	n.a.
3.b.	Is capital spending by SNGs coordinated with the central government?	n.a.
3.c.	Does the central government have a transparent, rule-based system for making capital transfers to SNGs, and for providing timely information on such transfers?	n.a.
4.a.	Has the government published a strategy for PPPs and issued standard criteria for entering PPP arrangements?	Policy exists; Act submitted to Cabinet
4.b.	Are PPPs subject to value for money review by a dedicated PPP unit prior to approval?	Yes
4.c.	Is the accumulation of explicit and/or contingent PPP liabilities systematically recorded and controlled?	No
5.a.	Does the regulatory framework support competition in contestable markets for economic infrastructure (e.g., power, water, telecoms, and transport)?	The intention is to support competition
5.b.	Are there independent regulators who set the prices of economic infrastructure services based on objective economic criteria?	Yes

¹ Prepared by A. Cheasty, IMF.

5.c.	Does the government oversee the investment plans of infrastructure SOEs and monitor their financial performance?	Yes
II.	Allocation	Seychelles
6.a.	Is capital spending by ministry forecasted over a multiyear horizon?	Yes; 3 years in PSIP
6.b.	Are there multiyear ceilings on capital expenditure by ministry or program?	Yes; 3 years in PSIP (but allocations are annual)
6.c.	Are projections of the full cost of major capital projects over their life cycles published?	For 3 years (in PSIP)
7.a.	Is capital spending mostly undertaken through the budget?	Yes
7.b.	Are externally funded capital projects included in the budget documentation?	Yes
7.c.	Is information on PPP transactions included in the budget documentation?	Not yet
8.a.	Are capital and recurrent budgets prepared and presented together?	Yes
8.b.	Does the budget include appropriations of the recurrent costs associated with capital investment projects?	Yes
8.c.	Does the budget classification and chart of accounts distinguish clearly between recurrent and capital expenditure, in line with international standards?	Yes
9.a.	Are capital projects subject to standardized cost-benefit analyses whose results are published?	Yes, CBAs, but not published
9.b.	Is there a standard methodology and central support for the appraisal of projects?	Yes, PIM manual (being updated)
9.c.	Are risks taken into account in project appraisals?	Yes (see PIM manual)
10.a.	Does the government undertake a central review of major project appraisals before decisions are taken to include projects in the budget?	Yes, Development Committee.
10.b.	Does the government publish and adhere to standard criteria for project selection?	Yes, standard criteria; manual 'public but not published'
10.c.	Does the government maintain a pipeline of approved investment projects for inclusion in the annual budget?	Yes

III.	Implementation	Seychelles
11.a.	Are total project outlays appropriated by parliament at the time of the project's commencement?	No, annually, but ongoing projects have priority
11.b	Are in-year transfers of appropriations (virement) from capital to current spending prevented?	Yes
11.c	Can unspent appropriations for capital spending be carried over to future years?	No, but plan to change this
12.a.	Are ministries/agencies able to plan and commit expenditure on capital projects in advance on the basis of reliable cash flow forecasts?	Can request early release
12.b	Is cash for project outlays released in a timely manner?	Yes
12.c	Is external (donor) financing of capital projects integrated into cash management and the TSA?	Mainly; there are some dedicated accounts
13.a	Is the procurement process for major capital projects open and transparent?	Yes
13.b	Are major capital projects subject to monitoring during project implementation?	Yes, on-site
13.c	Are ex post audits of capital projects routinely undertaken?	No
14.a.	Do ministries have effective project management arrangements in place?	Varies by ministry
14.b.	Has the government issued rules, procedures and guidelines for project adjustments that are applied systematically across all major projects?	Yes, PIM manual
14.c.	Does the government systematically conduct an ex post review and evaluation of a project that has completed its construction phase?	No
15.a	Are surveys of the stocks, values, and conditions of public assets regularly conducted?	Asset audit being undertaken
15.b	Are nonfinancial asset values recorded in the government balance sheets?	No
15.c	Is depreciation of fixed assets captured in government operating statements?	No (though depreciation is measured)
<p><i>Note: the responses are taken from interviews and hence are indicative rather than constituting a full verified PIMA exercise.</i></p>		

Appendix. CCPA Template

1. Climate change risks and expected impacts

Impact of climate change risks on the macro-framework/long-term outlook

- *How vulnerable is the economy to climate change?*
- *What impact could climate change have on macro-sustainability?*

Table of recent and expected climatic developments

2. General preparedness for climate change

The NDC and other national resilience-building strategies

- *Does the NDC present a comprehensive and costed strategy for climate change response?*
- *Is the climate change strategy consistent with broader development goals?*

Disaster planning and other contingency plans

- *How well-prepared is the country to cope with possible intensified disasters?*

3. Contribution to mitigation

Statement of NDC pledge

- *How does the country plan to meet its emissions reduction target?*

Clean energy plans

Carbon taxation and fuel subsidy policies

- *Does the current tax/subsidy system deliver appropriate carbon pricing?*
- *What would the tax system look like with recommended carbon pricing?*

Other carbon pricing strategies

- *What other carbon-pricing strategies could usefully contribute to mitigation?*

Other macro-relevant policies for mitigation

- *Are any further large-scale mitigation policies relevant to the country?*

4. Adaptation plans

- *Has the country developed an adequate strategy to adapt to climate change?*

Public investment plans

Table of Costed Climate Change Projects (if costing has been done)	US\$ million	%GDP
Total		
Mitigation		
Adaptation		

- *What, if anything, is missing from the adaptation investment strategy?*
Other public programs (regulation reform, zoning...)
- *Adaptation isn't just a matter of investment spending; what regulations support it?*
Financial sector preparedness
- *How is the financial sector contributing to the climate change effort?*

5. Financing strategy for mitigation and adaptation programs

Current state of financing

- *Does the country have adequate financing to meet the needs of its climate change strategy?*

Consistency of climate change spending and financing plans with fiscal and external debt sustainability

- *Are the country's climate changes plans consistent with fiscal and external debt sustainability?*

Other macro-considerations

- *Would implementation of the climate change plans have any (good or bad) spillover effects to the macro-economy?*

Institutional issues

6. Risk management strategy

Risk assessment procedures (e.g., fiscal risk statement)

- *How well does the government assess risk?*

Self-insurance (government financial buffers including contingency provisions, rainy-day funds, NIR...)

- *To what extent does the government self-insure against risks?*

Risk reduction and transfer (other insurance, pooling arrangements, ...)

- *To what extent does the economy transfer risk?*

7. National processes

Integration of climate change into national planning processes

- *Have climate-related projects been mainstreamed into national planning?*

Adequacy of public investment management system (effectiveness of procedures for identifying, evaluating, selecting, and implementing projects)

- *Are adequate public investment management systems in place, to ensure climate-related investments will be well-spent?*

Adequacy of PFM systems for managing CC financing and outlays (transparent on-budget treatment of CC activities, multi-year budgeting, etc.)

- *Are adequate public financial management systems in place, to protect climate-related funding?*

8. Taking stock: priority needs to be met

- *What resources does the country need to mobilize, to achieve its climate-change strategy?*

Annexes contain information important to one or other institution, but which have not necessarily been fully reviewed by both.