Staying Small and Beautiful: Enhancing Sustainability in the Small Island Developing States

Geeta Batra and Trond Norheim

Abstract

Spread over the ocean regions of the Caribbean, the Pacific and Atlantic, the Indian Ocean, the Mediterranean, and the South China Sea, the small island developing states (SIDS) are a distinct group of developing countries often known for their rich biological diversity, oceans, tourism, and fisheries. The pressures on these and other natural resources is most immediate in the islands where the high vulnerability to the impacts of climate change, limited land and water resources, often unsustainable natural resource use, and other particular economic vulnerabilities are disrupting livelihoods. The COVID-19 pandemic has further exacerbated the SIDS economies and livelihoods. Over the past 25 years the Global Environment Facility (GEF) has supported interventions in SIDS through \$578 million in financing, in critical areas such as biodiversity protection, climate resilience, and energy access through renewable energy. But how effective and sustainable have these interventions been? What factors influencing the sustainability of GEF interventions can pro-

vide insights for future project design and implementation? This chapter draws on findings from a recent country cluster evaluation on SIDS conducted by the Independent Evaluation Office (IEO) of the GEF. It presents the main environmental challenges in SIDS, the evidence on the relevance and effectiveness of GEF interventions in addressing these challenges, and the main risks to sustainability of outcomes. Important contextual factors that affect sustainability in SIDS include good policies and legal and regulatory frameworks, national ownership of projects, environmental awareness, institutional capacity, and strategic institutional partnerships. Project-related factors including good project design and adaptive project management, scaling-up and replication based on lessons learned, and a good exit strategy are also important for sustainability.

Keywords

GEF · Sustainability · SIDS · Biodiversity · Climate change

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Introduction

Spread over the ocean regions of the Caribbean, the Pacific and Atlantic, the Indian Ocean, the Mediterranean, and the South China Sea, the

small island developing states (SIDS) are a distinct group of developing countries often known for their rich biological diversity, oceans, tourism, and fisheries. The pressures on these and other natural resources is most immediate in the islands where the high vulnerability to the impacts of climate change, limited land and water resources, often unsustainable natural resource use, and other particular economic vulnerabilities are disrupting livelihoods. The COVID-19 pandemic has further exacerbated the SIDS economies and livelihoods. Over the past 25 years the Global Environment Facility (GEF) has supported interventions in the SIDS through \$578 million in financing, in critical areas such as biodiversity protection, climate resilience, and energy access through renewable energy. But how effective and sustainable have these interventions been? What factors influencing the sustainability of GEF interventions can provide insights for future project design and implementation?

Despite many regional and national differences indicative of the heterogeneity across SIDS, with context-specific environmental and socioeconomic development challenges (United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States [UN OHRLLS], 2015; United Nations Environment Programme [UNEP], 1999, 2008, 2010, 2013; World Bank, 2009, 2015), these nations share certain geophysical constraints, environmental challenges, and economic vulnerabilities due to their small size, geographic remoteness, and fragile environments. Their resource base is limited with a predominant focus on natural resources and tourism, domestic markets are typically small, and remoteness results in high costs for energy, infrastructure, and transportation, and a heavy dependence on a few markets for exports. Their openness makes them particularly vulnerable to economic shocks and their growth has been sluggish (OECD, 2018). SIDS are also highly vulnerable to climate change and natural disasters. Climate change is causing sea-level rise, beach erosion, coral bleaching, more invasive alien species, and is

fundamentally adversely impacting the main economic sectors of agriculture, fishing, and tourism.

The GEF Independent Evaluation Office (IEO) conducted a strategic country cluster evaluation (SCCE) of SIDS in 2019–2020, evaluating the relevance and effectiveness of GEF interventions in countries in the Atlantic, Indian Ocean, Caribbean, and the Pacific. The overarching objectives of the SCCE were:

1. To assess the relevance of GEF support in addressing the main environmental challenges in SIDS.
2. To provide a deeper understanding of the determinants of sustainability of outcomes for future design and implementation.

To address these questions, we analyzed GEF SIDS projects completed between 2007 and 2014 for sustainability of outcomes; these date parameters provided sufficient time after project completion to observe early trends towards sustainability of outcomes. To further explore the determinants of sustainability, we undertook country case studies of Kiribati and Vanuatu in the Pacific; Comoros, Maldives, Mauritius, and Seychelles in the Indian Ocean; Guinea-Bissau in West Africa/Atlantic; and Belize, Dominican Republic, Jamaica, and St. Lucia in the Caribbean. The evaluation also examined cross-cutting issues on gender, vulnerability/resilience, and private sector engagement in relation to their role in achieving sustainable outcomes.

Environmental Challenges in SIDS

SIDS confront many severe challenges, especially climate change that results in sea-level rise, the increased impact of natural disasters and invasive alien species, problems relating to non-sustainable use of land and water affecting the productive sectors, and issues with the governance of the natural resources (UN OHRLLS, 2015; UNEP, 1999, 2008, 2010, 2013; World Bank, 2009, 2015).

According to an Intergovernmental Panel on Climate Change (2019) special report, *The Ocean and Cryosphere in a Changing Climate*, the sea level is likely to rise 0.61–1.10 m by 2100 if global greenhouse gas emissions are not mitigated. However, a rise of 2 meters or more cannot be ruled out. Even if efforts to mitigate emissions are effective, extreme sea level events will become common before 2100, and probably by 2050 in many locations. Without ambitious adaptation, the combined impact of hazards such as coastal storms and high tides will drastically increase the frequency and severity of flooding and land erosion in low-lying SIDS (OECD, 2018). Particularly at risk from rising sea levels are the Bahamas, Kiribati, Maldives, the Marshall Islands, and Tuvalu, where between 30% and 55% of the land is less than 5 m above sea level (World Bank, [n.d.](#)).

Beach erosion is another common problem in SIDS, and has increased due to climate change. The coral reefs around many islands are also severely affected by global warming, which is causing ocean acidification, reef degeneration, and more frequent coral bleaching. Coastal tourism-related development and an influx of tourists put pressure on coastal areas and feed into coral reef degradation. More than 70% of Antigua and Barbuda's coral reef is threatened by coastal development; in St. Vincent and the Grenadines, the coral reefs around Tobago Cays are under threat of further deterioration due to the anchoring of cruise ships. The development of marinas, hotels, and other tourism-related facilities has also put pressure on mangroves and wetlands and reduced important fish breeding habitats.

The primary sectors of agriculture, agroforestry, fisheries, and tourism are important in most SIDS. In atoll countries, soils are mostly infertile and not conducive for agriculture. Limited freshwater resources combined with excessive drainage in these islands makes agriculture even more difficult, with the result that annual crops often are produced only in the rainy season. Climate change and unusual weather variability have made agricultural production planning increasingly difficult. The volcanic islands often have

fertile soils and a large number of crops can be produced at different altitudes. However, the soils are often degraded due to deforestation and over-exploitation by a relatively high population, and strong tropical rainfalls cause erosion and landslides. Poor land management practices such as slash-and-burn agriculture, uncontrolled livestock grazing on fragile lands, poor road construction, and unplanned or poorly planned settlements in landslide-prone areas have further exacerbated land degradation (Food and Agricultural Organization of the United Nations, 2017). In SIDS in Latin America and the Caribbean, land degradation costs an estimated \$4.8 billion dollars annually, and impacts approximately 125 million people within the region (UNEP, 2014). It directly impacts human livelihoods and survival, with significant negative implications for the most vulnerable groups in society.

Many SIDS see themselves as large ocean states, as their ocean territories are approximately 20.7 times greater than their land area, and many are promoting sustainable use of ocean resources while generating economic growth, building social and financial inclusion, and preserving and restoring ocean ecosystems (Meddeb, 2020). The oceanic and coastal fishing industry represents an important source of nutrition and revenue for SIDS populations. However, unsustainable commercial fishing has put pressure on marine resources. In Nauru, Palau, and Tonga, commercial fishing accounts for 50%–70% of total fishery activity, and although the number of tons produced per year is rather small, it does have an impact on fish stocks. The top three fish-exporting SIDS—Fiji, Kiribati, and Papua New Guinea—have lower rates of commercial fishing, ranging from 10.0% to 28.6% of the country's respective total fishery activity. Marine resources here are also threatened by natural disasters, mainly cyclones, damaging fishing grounds and fish breeding habitats, and seabed mining is a critical issue in Papua New Guinea. In all SIDS, illegal, unreported, and unregulated fishing; harmful fishing subsidies; pollution; habitat degradation; governance structures; and a lack of policies and their enforcement pose threats to marine resources.

The isolated nature of SIDS makes for small populations and restricted habitats, leading in turn to often unique but also extremely fragile biodiversity, where species often lack the ability to adapt to rapid changes. Countries that currently face immediate threats to their flora and fauna include Cabo Verde, Cook Islands, Guinea-Bissau, Kiribati, Palau, São Tomé and Príncipe, the Solomon Islands, and Vanuatu.

Invasive alien species are the primary cause of species extinctions in island ecosystems. If left unchecked, these species can degrade critical ecosystem services on islands, such as the provision of water and the productivity of coastal areas. Large numbers of invasive alien plants often cause problems in the agricultural sector and forest areas, and in freshwater bodies. Invasive animal species are also a big problem, such as the small Indian mongoose (*Herpestes auropunctatus*) and rats that prey on native animals and eat bird eggs. In the ocean, invasive alien species have been less frequently reported, but the lionfish (*Pterois volitans*) that is native to the Indo-Pacific is a problem in the Caribbean, where its toxic spikes are a threat to biodiversity and tourists.

Another challenging issue in SIDS is waste management, due to lack of space and deficient waste-handling systems. Solid waste is frequently burned or discarded in the sea or in nearby mangroves. Large amounts of solid waste are accumulated on land, then often flow into the ocean. The substantial number of tourists and tourist facilities in many SIDS increase the amount of waste produced. In St. Vincent and the Grenadines, wastewater from tourist yachts has severely polluted the eastern coasts. Solid and liquid waste make their way to the coastal areas, contaminating beaches and marine ecosystems. Sewage water most often goes directly into the sea without any treatment. Permeation of aquifers by wastewater, including contaminated water from agricultural production (fertilizers, pesticides), also reduces water quality.

Many SIDS have rich but currently untapped repositories of mineral resources. Extraction is an important source of foreign capital and government revenue, and a source of jobs, but is also

associated with negative environmental effects. Mining takes a toll on the environment in several SIDS. For example, some of Guyana's and Suriname's extractive processes for gold use cyanide and mercury, which are both highly toxic. Impacts from mining include soil contamination, deforestation, removal of soil surface, and biodiversity loss. In the Americas, SIDS particularly at risk from the environmental impacts of mining are Cuba, the Dominican Republic, Guyana, Haiti, Jamaica, and Suriname. In the Pacific, phosphate mining in Nauru has a major impact on natural resources. For many SIDS, sand mining and seabed mining are practices that have a major impact on the integrity and sustainability of local ecosystems.

The discussion above highlights the fact that environmental issues in SIDS are clearly interrelated and impacted by economic constraints such as limited diversification; small markets; high levels of indebtedness; high costs of energy, infrastructure, communication, and transportation; limited institutional capacity; and brain drain. Growing recognition of the vital importance of the oceans to the economies and livelihoods in SIDS has increased calls for integrated "blue economy" approaches, the "sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health" (World Bank, 2017). At the same time, SIDS face fundamental challenges that must be tackled immediately—especially their high vulnerability to the impacts of climate change, reflected in the need for sustainable management of natural resources on land and in the ocean, and the need to convert to renewable and less costly energy sources. Adaptation measures are complicated by limited land and water resources, lack of awareness, and long-standing traditions of unsustainable exploitation of resources. As such, appropriate environmental interventions would require an integrated approach to land, water, forest, biodiversity, and coastal resource management, which in turn would have an impact on economic livelihoods. In the next section, we highlight some of the main SIDS interventions of the GEF that aim to address these complex and systemic challenges.

GEF Interventions in SIDS

The GEF has a mandate to protect the global environmental commons—the biodiversity, water, oceans, healthy forests, land, and stable climate on which the planet and human health depend. The pressures on these resources are immediate in SIDS, in view of their unique biodiversity and vulnerability. Although the GEF does not have an official strategy for SIDS, it has for more than 25 years supported projects in critical areas for SIDS such as biodiversity protection on land and in the ocean, resilience to climate change and related disaster risk management, increased energy access through renewable energy and energy efficiency, halting and reversing land degradation, cooperation on international waters, and improved chemicals management. In total, between 2006 and 2018, the GEF has invested \$1.37 billion in SIDS through 337 interventions, 219 of which were at the country level and the others at a regional level. Recently, the GEF has planned an additional \$233 million commitment through 2022. Of GEF allocations in SIDS, 43% are in Asia, 37% in Latin America and the Caribbean, and 20% in the Atlantic, Indian Ocean, Mediterranean and South China Sea (AIMS). The GEF implements projects through 18 implementing agencies. The United Nations Development Program (UNDP) has implemented more than half the GEF projects in SIDS; together, the UNDP, UNEP, and World Bank have implemented more than 85% of the GEF SIDS portfolio.

This evaluation included a desk review of the portfolio of 286 GEF projects in the 39 SIDS. Most GEF projects reviewed are focused on climate change mitigation and adaptation, including energy, followed by biodiversity (31%) and international waters. Table 1 presents the environmental domains addressed in the GEF SIDS projects. Fifteen percent of the portfolio's projects address more than one area. Many projects cover watershed management from an integrated natural resource management perspective, sometimes with a ridge to reef approach, and establish alliances with the agricultural sector in conservation

Table 1 Environmental domains in SIDS GEF projects

Environmental domains	Projects	%
Threats to terrestrial biodiversity	71	24.91
Deforestation and land degradation	48	16.84
Climate change mitigation—emission reduction	45	15.79
Climate change adaptation—sea-level rise	42	14.74
Water quality and quantity	39	13.68
General capacity building	39	13.68
Climate change mitigation—renewable energy and energy efficiency	35	12.28
Threats to marine resources	34	11.93
Coastal and coral reef degradation	30	10.53
Threats to freshwater fishery resources	17	5.96
Waste management	14	4.91
Climate change adaptation—natural disasters	5	1.75

of soil, water, and biodiversity.¹ Many projects under one focal area generate co-benefits in other areas, especially between the areas of biodiversity and climate change, but these co-benefits are often not measured. The chapter appendix provides a list of all projects discussed in this chapter, their implementing agencies, and the countries in which the interventions took place.

We found that all projects reviewed had a satisfactory rating for relevance to the national environmental challenges and were relevant for the environmental priorities in relation to national priorities.² This was further reflected in the governments' interest in employing GEF funding to confront their challenges. GEF-financed projects

¹Two examples are A Ridge to Reef Approach for the Integrated Management of Marine, Coastal and Terrestrial Ecosystems in the Seychelles; and Conserving Biodiversity and Reducing Land Degradation Using a Ridge to Reef Approach in St. Vincent and the Grenadines.

²Some examples include Support to the Alignment of Jamaica's National Action Programme to the UNCCD 10 Year Strategy; Mainstreaming Global Environmental Priorities into National Policies and Programmes; Renewable Energy Technology Development and Application, which supported the Maldives national strategy in the area of renewable energy; and Sustainable Management of POPs in Mauritius, which was designed to comply with the priorities in the Mauritius National Implementation Plan on hazardous waste.

are also well aligned with the GEF and convention strategies in climate change, biodiversity, sustainable forest management, and hazardous waste. The ministers of environment and other government officials interviewed highlighted that the GEF is an important source of funding that fits into their priorities and planning. This is also reflected in the country programs of GEF Agencies that have a national presence, including the UNDP, the World Bank, and regional development banks (Inter-American Development Bank, African Development Bank, and Asian Development Bank). Discussions around formulation and identification of priority areas take place between the GEF focal point in a country's government and relevant ministries and agencies, with consultation with relevant GEF Agencies.

Climate Resilience

The GEF adaptation projects support investment, policy, and capacity-building measures in a range of sectors that are vulnerable to climate risk, including agriculture, fisheries, water resources, health, and urban and coastal settlements. To improve climate resilience and reduce disaster risks, the GEF supports land use planning with an integrated and sustainable natural resources management approach and disaster risk management focused especially on prevention and mitigation of natural disasters. Through its two adaptation funds, the Least Developed Countries Fund and the Special Climate

Change Fund, the GEF has built an active portfolio of projects across SIDS in Africa, the Indian Ocean, Asia-Pacific, and Latin America and the Caribbean. Recent GEF support has focused on:

- Disaster preparedness and resilience, including mapping of disaster-prone areas and establishment of local early warning systems, as well as ecosystem-based approaches
- Innovative tools to manage disaster risk such as risk insurance facilities, risk pooling, risk transfer, and supportive policy and capacities
- Win-win solutions that can deliver both adaptation and global environmental benefits, such as improved access to drinking water (including rainwater harvesting), improved access to clean and resilient energy, more climate-resilient smallholder food systems, and integrated semiurban and urban planning

Building the capacity of the private sector to engage in climate change adaptation and mainstreaming community and gender considerations are also important aspects.

For example, the Kiribati Adaptation Program focused on climate resilience and disaster risk management, including the design of seawalls to protect against sea-level rise and coastal erosion. The subsequent phases continued the process, strengthening climate resilience based on the strategies and designs developed, and improved the seawall designs based on lessons learned during the previous phase (see Fig. 1).

Fig. 1 Seawall models used in the World Bank's Kiribati Adaptation Program (KAP). From left: Failed eroded KAP II sandbag seawall, KAP III seawall with cement sandbags, and KAP III rock seawall using imported rocks. (2019 photos courtesy T. Norheim)

Integrated Resource Management Through Ridge to Reef

Thirty percent of the GEF projects in SIDS consider integrated approaches such as ridge to reef, whole island approach, or blue economy. The GEF is supporting SIDS countries in implementing such approaches to sustainably manage soil, water, and biodiversity while also considering renewable energy resources and productive sectors such as agriculture, forestry, fisheries, and tourism. “Ridge to reef” is an integrated watershed management approach in which the planning area starts at the top of the island and ends at the coral reef. The approach is designed to reverse the degradation of coastal resources by finding ways to reduce the flow of untreated wastewater, chemicals, nutrients, and sediments from land-based economic activities and cities into deltas, coastal zones, and oceans. Two ecosystems are specifically important for the resilience and economic viability of the coastal zones: the mangroves and the coral reef. Ridge to reef is one important measure to help defend these ecosystems that protect human settlements against natural disasters and are also important for productivity of fisheries. Consequently, this approach employs integrated water resource management and integrated coastal management plans that come together into long-term sustainable use of natural resources, while limiting the impact on fragile environments.

Blue Economy

Another priority area of the GEF is strengthening national blue economy opportunities through a combination of national and regional investments. GEF support aims to sustain healthy coastal and marine ecosystems, catalyze sustainable fisheries management, and address pollution reduction in marine environments. The GEF assists SIDS in identifying sustainable public and private national investments through funding of collective management of coastal and marine systems and implementation of integrated ocean policies and legal and institutional reforms. This

support is often channeled through regional GEF programs, which also encourage South-South knowledge transfer. Examples from the various regions are the Pacific’s Strategic Action Program, Addressing Land-Based Activities in the Western Indian Ocean, and Catalyzing Implementation of the Strategic Action Programme for the Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems.

Protected Areas

GEF assistance has included the establishment of new protected areas, building capacity for planning and effective area management including co-management with local stakeholders, and establishment of protected area funds and other mechanisms for sustainable financing. The GEF supports strategies to reduce the negative impacts of tourism, fisheries, and agriculture, while at the same time allowing traditional communities situated in and around the areas to carry out sustainable income-generating activities from fruit, nuts, fish, eco-tourism, etc., based on the ecosystems’ carrying capacity.

Land Use Management

The GEF’s work in land degradation—specifically deforestation and desertification—has emphasized the need to take an integrated approach to sustainable land management while ensuring the sustainability of livelihoods. The GEF has now expanded this approach to include the United Nations Convention to Combat Desertification (UNCCD, 2017) guiding principle of land degradation neutrality. The GEF’s support to SIDS has evolved in the same way, seeking to ultimately halt and reverse land degradation, restore degraded ecosystems, and sustainably manage the resources.

The many environmental challenges on land and in the ocean are interconnected, and GEF projects to confront these challenges recognize this. Addressing a single challenge separately is

not possible, because management of soil, water, and waste impacts the ocean, and thereby human economic activities, especially fisheries. Examples of projects demonstrating this include the regional program Combating Living Resource Depletion and Coastal Area Degradation in the Guinea Current LME Through Ecosystem-Based Regional Actions; Integrated Ecological Planning and Sustainable Land Management in Coastal Ecosystems of Comoros; and Integrated Management of the Yallahs River and Hope River Watersheds.

Invasive Alien Species

Invasive alien species are one of the main causes of ecosystem degradation and species extinctions in SIDS. Many SIDS have been geographically isolated for thousands of years and are therefore more vulnerable to the effects of alien species. The GEF continues to support the implementation of comprehensive prevention, early detection, control, and management, while emphasizing a risk management approach that focuses on the highest risk invasion pathways.

Chemicals and Waste

Toxic chemicals, other hazardous waste, and waste arriving from the ocean present acute challenges to the fragile ecosystems in SIDS and their coastal areas. GEF programs seek to address the sound management of chemicals and waste through strengthening the capacity of subnational, national, and regional institutions and strengthening the enabling policy and regulatory framework in these countries.

Renewable Energy and Energy Efficiency

Several SIDS have a huge potential of untapped renewable energy resources from solar, wind, hydroelectric, tidal, geothermal, and biomass

resources, but continue to meet a high percentage of their energy needs by burning fossil fuels. The GEF supports SIDS to strengthen national energy security, develop clean energy policies, catalyze private investments in the renewable energy sector, and facilitate the use of advanced renewable energy and energy efficiency technologies in agriculture and urban and rural development, with co-benefits to health, community development, poverty eradication, and women's empowerment.

Within each of these areas, the GEF must assure support to achieve global environmental benefits. This evaluation showed that, consistent with the challenges SIDS confront, the most important areas include maintaining biodiversity goods and services (36.8%) and support for low-emission development (35.1%), followed by enhancement of the countries' capacity to implement multilateral environmental agreements and mainstream them into national and subnational policy, planning, financial, and legal frameworks (26%).

In all the different focal areas, GEF interventions have mostly focused on strategy implementation and institutional capacity development, and on various aspects of knowledge management. Infrastructure investment is included in only a few projects, usually at a small scale. Institutional strengthening, including training, continues to be important, not only for SIDS governments, but also for effectiveness and efficiency in all GEF projects (see Table 2). These issues are especially significant for the least developed countries (LDCs) that have fewer resources for the public sector. SIDS are also in favor of regional projects with South-South sharing of knowledge, which is yielding important benefits for the smallest and poorest countries. The evaluation found support for regional programs especially in the Indian Ocean, but also in the Caribbean and Pacific, where countries are in favor of regional programs if they include a strong national component (for pilot projects), and transfer of knowledge/lessons learned that especially benefit the smallest countries.

Table 2 GEF contribution areas

Area	Sub area	Projects	%
Strategy implementation	Technologies and approaches	120	42.11
	Implementing mechanisms and bodies	81	28.42
	Financial mechanisms for implementation and sustainability	62	21.75
Institutional capacity development	Policy, legal, and regulatory frameworks	172	60.35
	Governance structures and arrangements	66	23.16
	Informal processes for trust building and conflict resolution	1	0.35
Knowledge management	Knowledge generation	125	43.86
	Information sharing and access	92	32.28
	Awareness raising	73	25.61
	Skills building	152	53.33
	Monitoring and evaluation	73	25.61

Table 3 Positive environmental outcomes mentioned in the terminal evaluation reports in SIDS

Area of positive environmental outcome	Projects	%
Threats to terrestrial biodiversity	18	51.43
Deforestation and land degradation, including SLM	13	37.14
Water quality and quantity	10	28.57
Waste management	8	22.86
Threats to marine resources	7	20.00
Coastal and coral reef degradation	5	14.29
Climate change mitigation, emission reduction	5	14.29
Renewable energy and energy efficiency	5	14.29
Climate change; sea level rise	2	5.71
Other	1	2.86

Note: The total number of projects is higher than the number of the projects with terminal evaluations (45) because several projects had more than one environmental outcome

Table 4 Areas of positive changes in building institutional capacity/governance in GEF projects in SIDS

Area of capacity building, institutional development, or improved governance	Projects	%
Capacity and skills development	38	86.36
Awareness raising	32	72.73
Development of plans, policies, codes, covenants, laws, and regulations	25	56.82
Knowledge management, information-sharing, and knowledge systems	24	54.55
Institutional and decision-making processes, structures, and systems	17	38.64
Environmental monitoring systems	14	31.82
Decision-makers' information and access to information	6	13.64
Trust-building and conflict resolution	2	4.55
Other	1	2.27

Note: The total number of projects is higher than the number of the projects with terminal evaluations (45) because several projects had more than one area of positive change

Performance and Sustainability of GEF Projects in SIDS

Based on a detailed review of 45 closed SIDS projects with terminal evaluation reports prepared at closure, we observed positive environmental institutional capacity building and socioeconomic outcomes in more than 75% of the projects (for example, see Box 1). The findings were further validated through in-country visits to these projects in 2018. The main positive environmental impacts were in the areas of biodi-

versity, deforestation/land degradation, and water quality/quantity (see Table 3). Socioeconomic outcomes were observed in the areas of income generation/diversification, private sector engagement, and civil society engagement. All the projects except one (97.78%) reported improvements in institutional capacity or governance (see Table 4).

Overall, the SIDS portfolio performance was slightly lower than that of the overall GEF portfolio. Factors contributing to this include limited project preparation time, particularly for projects

cutting across various environmental areas; the relative complication of GEF projects, compared to those of other funding agencies, and the projects' additional burden on existing limited capacity; and weak national institutional capacity for procurement. Of note, nearly all GEF projects are implemented during a single phase with a duration of 4–5 years. New projects with similar or complementary goals are often approved without designing a coherent next phase based on results and lessons learned. Monitoring information, including the availability of baseline data, continues to be a challenge.

Sustainability

Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1983). For a project, sustainability is understood as the likelihood of continuation of the benefits after completion of project implementation. Donors are increasingly interested in ensuring that benefits continue past interventions to ensure longer term outcomes and impacts.

Box 1: Case Study: Geospatial Analyses on the Outcomes of the Iyanola—Natural Resource Management Project in the NE Coast of St. Lucia

This case study demonstrates the relevance and effectiveness of GEF interventions using geospatial analysis. The \$7.3 million Iyanola—Natural Resource Management of the NE Coast project was launched in 2015 to improve the effective management and sustainable use of the natural resource base of the northeast coast of Saint Lucia and generate multiple global environmental benefits. The region hosts Iyanola dry forests that are classified as the key biodiversity areas and as important bird areas. These dry forests are unique to the region and an important habitat for a combination of rare and endemic flora and fauna species, with ecosystems rich in biodiversity and unique dry scrub forests and pristine beaches (see Figs. 2 and 3). The forest region is also endowed with a variety of environmental resources that form an important and potential socioeconomic and cultural asset base of the island's national economy.

The Iyanola dry forests area is threatened mainly by agriculture expansion, logging, and forest fire due to slash-and-burn

practices. To address these threats, the GEF project adopted a cross-sectoral, strategic approach to integrated landscape management involving forest, coastal, and land use management. The main activities included developing a regulatory framework, enhancing capacity to produce biodiversity-friendly goods and services, restoration, and piloting land use plans. Time series forest loss data (see Fig. 4) shows an increase in forest loss in the protected area before the project implementation started in 2015, and a slight decrease during the project period. At the 2018 data point, the percent loss had further decreased to 0.05% in the protected area and about 0.04% in the buffer areas.

As a result of the GEF interventions, vegetation cover increased between 2015 and 2016 in restoration sites (see Fig. 5). The average normalized difference vegetation index (NDVI) at the three restoration sites increased by 20% between 2015 and 2018; the productivity tapered down in 2018 compared to the previous 2 years, perhaps due to a decrease in precipitation. The plantation of native and nonnative trees together with the understory led to increased vegetation productivity, also verified during site visits.

Fig. 2 Iyanola dry forests, St. Lucia

Fig. 3 Location of the Iyanola project sites

Fig. 4 Percent forest loss, 2001–2018. (Source: GEF IEO, 2019)

Fig. 5 Landsat-derived vegetation productivity at the restoration sites; NDVI before and during the project. (Source: GEF IEO, 2019)

The GEF SIDS SCCE examined 45 projects which were rated for their likely sustainability at completion. Half the projects had an overall sustainability rating of likely or moderately likely (see Table 5). We found relatively small differences between the different dimensions of sustainability, with political sustainability being most likely.

Factors Affecting the Sustainability of Outcomes in SIDS

The main contextual and project-related factors that affect sustainability are summarized in Table 6. These were developed based on field visits and further confirm results from our desk analysis of the 45 projects on national and regional

Table 5 Ratings on four dimensions of project sustainability in SIDS

Sustainability dimension	Likely/moderately likely	Moderately unlikely/unlikely	Not rated/NA
Financial	53	18	28.88
Political	62	9	28.89
Institutional	51	22	26.67
Environmental	49	9	42.22

Table 6 Observed contributing and hindering factors influencing the sustainability of outcomes

Sustainability	Contributing factors	Hindering factors
Context related	<ul style="list-style-type: none"> • Legal and institutional framework for environment and protected areas • Government policies supporting environmental conservation, climate change mitigation, and adaptation • National ownership of projects, reflected in government support and budget allocation • Strategic institutional partnerships • Public–private partnerships in the key sectors • Sustainable national financing mechanisms, e.g. environmental funds, to cofinance projects • General institutional capacity, especially in the public sector 	<ul style="list-style-type: none"> • Low institutional capacity, especially in the relatively smaller countries, with low ownership, little institutional memory, high turnover, and brain drain • Unfavorable political conditions and events in some countries (coup d'état, corruption, civil protests) • Often weak national and local environmental NGOs with low technical capacity and limited influence on decision making and low capacity on local level to implement planned activities • Low level of environmental awareness, reflected in the public's attitude to waste and to renewable energy sources • Pressure from the agricultural and tourism sectors to exploit sensitive areas, from a land, coastal, and marine environment perspective • Natural disasters and unfavorable environmental conditions (hurricane, drought, earthquake, tsunami) • Infrastructure constraints that make transport and communication across islands difficult, impacting learning and knowledge sharing
Project related	<ul style="list-style-type: none"> • Training and institutional capacity building, including introduction of new technology and new techniques • Buy-in and sense of ownership among key project stakeholders • Adaptive project management • Strength of project teams and engagement of steering committees • Strategic institutional partnerships • Replication and scaling-up based on lessons learned, including small-scale local investments financed by GEF-SGP, NGO/CSO, and the private sector 	<ul style="list-style-type: none"> • Project design that does not consider previous projects in the sector and lessons learned • Little consideration of impact and sustainability in the project design • Insufficient involvement of main stakeholders during design and implementation • Weak project monitoring and risk management • Insufficient national and local capacity building to assure continuation of activities • Lack of exit strategy and future financing to sustain the projects' momentum

interventions that were completed between 2007 and 2014, allowing time after project completion to observe the long-term sustainability of outcomes. Below, we discuss these factors with examples from GEF projects.

Project-related factors that influence sustainability include training and building institutional

capacity, good project design and adaptive project management, an engaged project steering committee, building strategic institutional partnerships, scaling up and replication based on lessons learned, and a good exit strategy.

We found that the most important project-related hindering factor was the quality of project

design, which sometimes gave little consideration to long-term impact and sustainability. Many of these SIDS projects had a short time horizon for planned outcomes and impact, and the issue of sustainability was often considered only from a financial point of view. Not enough consideration was given to previous projects in the same sector (e.g., biodiversity, energy) and even though the project documents always list preceding projects, seldom did deep analysis occur of lessons learned that could help avoid repeating errors from the past. Project plans from international consultants often provided a theoretical approach without on-the-ground technical and social knowledge; at the same time, most SIDS have less specialized capacity for project design. Therefore, collaboration between national specialists and international counterparts is necessary. Another challenge for many SIDS is that GEF projects must include a high percentage of cofinancing.

Important contextual factors that affect sustainability in SIDS were found to be national policies and legal and regulatory frameworks, national ownership of projects, national environmental funds, environmental awareness, institutional capacity, and strategic institutional partnerships.

The most important context-related factor was the national-level legal and regulatory framework for environment and protected areas, and the extent to which the laws were enforced. For instance, in Comoros, unsustainable forest and agricultural practices, including slash-and-burn and overexploitation for firewood and timber, have greatly reduced the possibility for regeneration of natural forest ecosystems. The government has developed policies and incentives to promote agricultural production and self-sufficiency of food products.

National ownership of the projects is an important contributing factor for sustainability, as reflected in local stakeholder participation and government support and budget allocation. Ownership by national institutions was clearly demonstrated in the case of the Partnership for Marine Protected Areas in Mauritius, in which various departments of the government have provided for sustained budgeting for the conservation of marine resources and biodiversity since the early 1990s. After the project closed in 2012,

the total annual budget for marine conservation was estimated at \$5.2 million and increased up to an average of approximately \$9.9 million from 2013 to 2018, with a peak budget of \$12.4 million in 2016 due to the construction of the Blue Bay Marine Park Centre.

The establishment of national environmental funds is important for sustainable development financing as demonstrated in Guinea-Bissau through the Biodiversity Conservation Trust Fund, which was able to achieve sustainable results, particularly in capacity building and institutional strengthening. Its most important result was the creation of the Bio Guinea Foundation (FBG) with an initial government funding of 1 million Euros. It is a public fund but managed autonomously with its own board, with the goal of covering the costs of the protected area system and supporting other biodiversity conservation initiatives. The Bio Guinea Foundation is to be capitalized with \$1.7 million, including \$0.9 million from the GEF's framework strengthening project.

Strategic institutional partnerships, including public-private partnerships, have been another key contributing factor in project sustainability. Long-term partnerships with national NGOs for protected area management have been fundamental for social, environmental, and financial sustainability of protected areas. In Seychelles, the protected area site Vallée de Mai is situated within the Praslin National Park, managed by the National Parks Authority, but is managed separately by the NGO Seychelles Islands Foundation (SIF). The site has the highest concentration of the endemic coco-de-mer palm (*Lodoicea maldivica*), found only on the islands of Praslin and Curieuse. The entrance fees from tourists visiting the site are used to cofinance the UNESCO World Heritage Sites of the Aldabra Atoll more than 1000 km away, where income from tourism is not so easy to manage.

Institutional Capacity, Environmental Awareness, and Economic Pressure

Our evaluation found that low levels of institutional capacity, lack of environmental awareness, and pressure from economic sectors had negative effects on projects' sustainability.

Overall low institutional capacity causes problems especially in the poorest SIDS countries, and brain drain has been an issue in the Pacific islands and the Caribbean. High turnover at the national level is another issue in many SIDS, especially in countries with a dynamic private sector such as Mauritius and the Dominican Republic. Some SIDS, such as Guinea-Bissau, Comoros, and Maldives, have passed through periods of political instability and coup d'état, which not only affected ongoing projects but also cut off financing from many development agencies for long periods.

Low technical capacity and limited direct influence on decision making of national and local environmental NGOs was another issue noted in Comoros, Kiribati, and Mauritius, where it has limited opportunities for national dialogue on sustainable development and reduced opportunities for partnerships such as those supporting local communities. In contrast, we found that the environmental NGOs in Jamaica and Seychelles were technically strong and had significant influence on political decisions.

Low levels of environmental awareness are reflected in the public's attitudes toward waste and renewable energy sources. One example is attitude regarding the use of disposable plastic. During country visits, evaluators observed huge amounts of solid waste along the coast line, along roads, and even in protected areas. However, communities that act a certain way based on short-term self-interest, mostly due to incentives, differ from communities that act based on awareness that their actions will benefit them and their livelihoods in the future. Awareness raising is a slow process, especially in countries with high poverty rates.

In Guinea-Bissau, the lack of public awareness was demonstrated in large amounts of garbage directly in front of schools established inside national parks, even though the schools have environmental education on the curriculum.³ The general lack of environmental awareness was also

clearly shown in Comoros, where solid waste was found all over the country and waste collection and handling is limited even in urban areas and tourist resorts. However, some governments, including Mauritius, Samoa, and Seychelles, have taken effective measures to forbid single-use plastic bags and conduct awareness campaigns through public media. The national component of the project in Mauritius installed waste incinerators and grids in the four main streams to prevent solid waste from entering the port waters in the Municipality of Port Louis.⁴

Another common challenge is pressure from economic sectors such as agriculture and tourism to exploit environmentally sensitive areas. Deforestation in SIDS due to the advance of the "agricultural frontier" has mostly been limited by lack of road infrastructure in the island interior, steep areas on the volcanic islands, and poor soils on the atoll islands. On the other hand, natural habitats such as mangroves and wetlands in coastal areas have often been eliminated due to shrimp farming and construction of coastal tourist resorts.

Sustainability changes over time as circumstances change. Two thirds of the 24 projects that were subject to field verification had positive (moderately likely or likely) sustainability ratings at completion, while the observed sustainability rating for the same projects was higher after the passage of time, at 81.25%.⁵ For example, in Guinea-Bissau, sustainability ratings improved with the political situation after the coup d'état ended. Another factor is the GEF's project funding timeline: The GEF normally finances only one project phase, with the expectation that the results will be achieved within that period. This evaluation, however, found that just one project intervention is often not sufficient to achieve sustainability. Multi-phase projects, such as the Kiribati Adaptation Program presented

³The problem is being addressed through local and national awareness raising through the project Strengthening the Financial and Operational Framework of the National Protected Areas System in Guinea-Bissau.

⁴Projects such as Addressing Land-Based Activities in the Western Indian Ocean have helped reduce the threats of waste to the health of marine and coastal ecosystems.

⁵The evaluation noted differences in sustainability ratings over time in 12 projects. In nine, sustainability improved over time; two projects had a decline in the sustainability rating; and in one project in St Lucia, the changes were mixed.

earlier, have a higher likelihood of sustainability.⁶ As an alternative to several phases, replication and scaling-up of project activities can strengthen the sustainability of outcomes. These follow-up interventions may be financed through other national or international sources.

GEF's Overall Additionality in SIDS

The GEF's strongest areas of additionality in SIDS are strengthening institutions and assistance with legal and regulatory frameworks, which, as the discussion above highlights, are very important for sustainability of outcomes (GEF IEO, 2018). Projects across SIDS have achieved results in other areas of additionality to varying degrees, with the weakest area being accessing private sector financing (see Table 7).

Table 7 GEF's main areas of additionality in SIDS

Additionality elements	Project design	Results achieved
<i>Innovation additionality</i>		
Focus on solar technology	✓	✓
Ridge to reef approach	✓	✓
IAS	✓	✓
<i>Socioeconomic additionality</i>		
Encouraging of local solutions	✓	✓
Social inclusiveness	✓	○
Social and economic benefits	✓	○
<i>Institutional/governance additionality</i>		
Strengthening of institutions	✓	✓
Environmental governance	✓	✓
<i>Financial additionality</i>		
Access to private sector financing	✓	○
<i>Policy/regulatory additionality</i>		
Strengthening of the policy and regulatory environment	✓	✓
<i>Environmental additionality</i>		
Adaptation	✓	✓

⁶The Preparation Phase KAP I was implemented 2003–2005 and the Pilot Implementation Phase KAP-II during 2006–2011 followed by the Expansion Phase KAP III. The program's expected outcome is strengthened climate resilience for Kiribati, especially on the main islands.

The evidence is also limited on projects achieving socioeconomic co-benefits and social inclusion. In terms of broadening and ensuring sustainable impact, the most important mechanism is mainstreaming activities in biodiversity and climate change through policies, strategies, and activities of the countries. The second significant channel is sustaining progress in environmental outcomes through attention to the project and contextual factors presented.

Conclusions

Despite the heterogeneity across SIDS, they confront many common and severe challenges: climate change that results in sea-level rise, the increased impact of natural disasters and invasive alien species, problems relating to unsustainable use of land and water affecting the productive sectors, and issues with the governance of natural resources. These are further impacted by common economic constraints such as limited diversification; small markets; high levels of indebtedness; high costs of energy, infrastructure, communication and transportation; limited institutional capacity; and brain drain. The COVID-19 pandemic has further exacerbated the situation, impacting the tourism industry that is an integral part of these economies. However, drawing on evaluative evidence and lessons from GEF projects, this chapter highlights two important points for sustainability of interventions. First, investment in proven integrated interventions, such as blue economy and ridge to reef approaches, is necessary. Expanding marine and coastal activities could help diversify these economies that are heavily reliant on the tourism sector. Second, attention to contextual and project-related factors is very important. Putting these economies on a path to sustainability and a greener recovery will require investments in sound policy and regulatory frameworks, institutional strengthening, financing from the public and private sectors, and innovations in locally driven solutions that generate economic benefits and are socially inclusive.

Appendix: Projects Discussed in Chap. 7

Project name	GEF ID	Country	Implementing agency
SIP: Integrated Ecological Planning and Sustainable Land Management in Coastal Ecosystems of the Comoros in the Three Island of (Grand Comore, Anjouan, and Moheli)	3363	Comoros	IFAD
SPWA-BD: Guinea Bissau Biodiversity Conservation Trust Fund Project	3817	Guinea-Bissau	World Bank
Strengthening the Financial and Operational Framework of the National PA System in Guinea-Bissau	5368	Guinea-Bissau	UNDP
Integrated Management of the Yallahs River and Hope River Watersheds	4454	Jamaica	IABD
Support to the Alignment of Jamaica's National Action Programme to the UNCCD 10 Year Strategy and Preparation of the Reporting and Review Process	5893	Jamaica	UNEP
Kiribati Adaptation Program—Pilot Implementation Phase (KAP-II)	2543	Kiribati	World Bank
Renewable Energy Technology Development and Application Project (RETDAP)	1029	Maldives	UNDP
Partnerships for Marine Protected Areas in Mauritius	1246	Mauritius	UNDP
Sustainable Management of POPs in Mauritius	3205	Mauritius	UNDP
A Ridge-to-Reef Approach for the Integrated Management of Marine, Coastal and Terrestrial Ecosystems in the Seychelles	9431	Seychelles	UNDP
Iyanola—Natural Resource Management of the NE Coast	5057	St. Lucia	UNEP
Conserving Biodiversity and Reducing Land Degradation Using a Ridge-to-Reef Approach	9580	St. Vincent and the Grenadines	UNDP
Mainstreaming Global Environmental Priorities into National Policies and Programmes	5655	Vanuatu	UNDP
Combating Living Resource Depletion and Coastal Area Degradation in the Guinea Current LME through Ecosystem-based Regional Actions	1188	Regional: Angola, Benin, Congo, Cote d'Ivoire, Cameroon, Gabon, Ghana, Equatorial Guinea, Guinea-Bissau, Liberia, Nigeria, Sierra Leone, São Tomé and Príncipe, Togo, Congo DR	UNDP
Catalyzing Implementation of the Strategic Action Programme for the Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CMLE+)	5542	Regional: Antigua and Barbuda, Barbados, Brazil, Belize, Colombia, Costa Rica, Dominica, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, Mexico, Panama, Suriname, Trinidad and Tobago, St. Vincent and Grenadines	UNDP
Strategic Action Programme (SAP) of the Pacific Small Island Developing States	530	Regional: Cook Islands, Fiji, Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Samoa	UNDP
Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)	1247	Regional: Kenya, Comoros, Madagascar, Mauritius, Mozambique, Seychelles, Tanzania, South Africa	UNEP

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Resources

- CBD Country profile for all countries visited: <https://cbd.int>
- Database of GEF projects: www.theget.org/projects
- GEF–UNDP Small Grants Program (SGP): www.sgp.undp.org
- IUCN Country Profiles: <https://www.iucn.org/regions>
- The Global Register of Introduced and Invasive Species: www.griis.org
- The IUCN Red List of Threatened Species: <https://www.iucnredlist.org>
- World Bank Country Profiles: <https://www.worldbank.org/en/country>

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