The Republic of Mauritius Country Profile





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Republic of Mauritius

Introduction

Mauritius actively employs national and international law to mitigate some of the challenges the country faces while also ensuring that they benefit and grow from the marine and coastal resources.

Key country indicators

The Republic of Mauritius is made up of the islands of Mauritius, Rodrigus, Agalega, Saint Brandon, Agalega, Tromelin, Diego Garcia, and Cargados Carajos and Chago Archipelago according to Article 111 of the Constitution of Mauritius (ROM, 1968). Mainland Mauritius is the largest and most populated of the islands. The population in 2018 was 1,265,303

The World Bank estimates Mauritius's total land area at 2000 km², with a coastline of 322 km. Mainland Mauritius covers an area of 1,865 km² and is volcanic in nature. The coastline has a 243 km² shallow lagoon area which makes it an ideal location for tourism, such as boating and

Population (2018)	1.265.303
GDP	.,
GNI	
Total land area	2000 km²
Length of coastline	332 km
Exclusive Economic Zone	$2.3 \text{ million } \text{km}^2$
Continental shelf	396,000 km²
Mangrove	1.2 km²
Coral reef	
Marine protected area	

Source: (World Bank, 2017)

snorkeling (Ragoonaden, 1997). The beach width varies from a few meters (in eastern and southern regions) to 25m (in the north-eastern regions). Mauritius has sovereign rights over an Exclusive Economic Zone (EEZ) and continental shelf of 2.3 million km² and 396,000 km² respectively (ROM). Despite the vast extent of EEZ, almost 99 per cent remains unexplored (MAIFS, 2017). About 0.3 per cent of Mauritius' territorial waters is Marine Protected Areas. The country's total coral reef and mangrove area are estimated at 870 km² and 1.2 km² (World Bank, 2017).

https://sustainabledevelopment.un.org/content/documents/11803Official-List-of-Proposed-SDG-Indicators.pdf

Ecosystems management

The challenge

The outcomes of human activity such as population growth, urban development, waste disposal are leading to environmental degradation, threatening the wellbeing of the marine and coastal ecosystems.

Target 14.2: Protect and restore ecosystems

UN definition: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

Status: The proportion of Mauritius' national exclusive economic zones managed using ecosystembased approaches is 49.6439 (UN Stats 2019)

The situation

The coastal ecosystems of Mauritius island include rocky shores, lagoon corals, seagrass beds, mangroves and other related marine life. Fringing reefs surround most of the volcanic island enclosing a lagoon of about 243 km² ranging in depth from 1 to 4m. The range of ecosystems support a wide variety of flora and fauna. The lagoons support a commercial fishery. Fish and shellfish culture is practiced in enclosed ponds (barachois); and other anthropogenic factors have contributed to reef stress and degradation. A rich algal biomass is present which shows seasonal variation. Two species of mangroves, Rhizophora mucronate and Bruguiera gymnorrhiza exist (Fagoonee, 1990) (MAIFS, 2017). There are over six species of seagrass beds including Entromorpha, Ulva, Sargassum, Caulerpa sp.Padina and Halimeda and these cover an estimated area of 55 ha to 649 ha (ASCLME, 2012) Other species marine invertebrates such as crabs, shrimps, lobsters, sea cucumbers, molluscs and octopus however these species have not been extensively studied or researched on.

The constraints

Coastal population growth

Mauritius is one of the most densely populated countries in the world with 629 inhabitants/ km²; with the 2019 population was estimated 1,270,000 people (UNDESA, 2019) at Approximately 27 per cent of its total population and 50 per cent of its rural population live within the coastal zone. Infrastructure is well-developed and contributes to supporting the economic development of the country. Port Louis is the main navigational gateway for trade. However, there are no regular maritime connections with the other islands of the South West Indian Ocean. Unemployment is also an issue with the unemployment rate for 2019 is forecasted at 6.7 per cent compared to 6.9 per cent in 2018 (Statistics Mauritius, 2019).

Tourism growth

Mauritius is well known for its superb and unique beaches There are 95 proclaimed public beaches making a total of an extent of 3232.466 hectares (Beeharry, Makoondlall-Chadee, & Bokhoree, 2014). The coastal zones across Mauritius have known several developments mostly because of the number of tourists visiting the island. However, these developments together with natural phenomenon have contributed to the degradation of these zones. For instance, in 1987 the coastal areas and mangrove cover was 20 km². By 1994, the cover had decreased (by 30 per cent) to 14 km² partly due to the expansion of the tourism industry which contributes about 8.7 per cent to the Mauritian GDP (CBD, 2019). However, there has been much effort put into the mangroves and this has led to a recovery of the sector as described in box 1



Box 1: Community involvement in mangrove recovery

Mangrove Propagation Programme which focused on reforesting the denuded areas. Through the Programme, almost 13 hectares of mangrove forest has been restored. Between 1995 and 1996, about 12,400 seedlings had been planted around the island covering an area of 22,750 square kilometres. The second phase, between 1997 and 1998, witnessed the planting of 47,500 seedlings along the west coast covering an area of 23,750 square kilometres. The third, and fourth phase saw the planting of 40,000 and 58,000 seedlings. To date a total of 214,800 seedlings covering approximately 13 hectares and with a survival rate of 78% had been planted.

Mauritius has over the years optimized the involvement of the communities in mangrove restoration programs and coral reef restoration. Community based coral reef restoration has been possible through the efforts of Mauritius Oceanography Institute which initiated a three-year Community Based Coral Culture Project. The project focused on capacity building and training of coastal communities on reef rehabilitation and coral farming methods.

http://moi.govmu.org/research/ongoing-projects https://www.ser-rrc.org/project/mauritius-mangrove-restoration/

Biodiversity loss

The discovery and subsequent colonization of the uninhabited Mascarenes (the archipelago consisting of Mauritius, Reunion and Rodrigues) played a significant role in the rampant loss of Mauritian biodiversity and extinction of some of its endangered species. According to the World Bank, approximately 7 species of mammals, 9 species of birds, 19 species of fish and 90 species of higher plants, are threatened (World Bank, 2017). UNEP estimates the level endemism at 39 per cent of plants, 40 per cent of bat species, 80 per cent of reptiles and 80 per cent of non-marine birds (CBD, 2019).

Mangroves have also been declining from 20 km² in 1987 to 14 km² in 1994. This has been catalyzed by traditional methods of harvesting firewood, building and construction purposes and also for boat building.

Alien invasive species

Further, the introduction of invasive exotic species predated and competed with the indigenous species leading to the latter's extinction and drastic reduction in numbers. Other contributing factors include climate change, urbanization, pest and diseases, pollution and population growth and alien invasive species.

The opportunities

Integrated Coastal Zone Management

ICZM is recognized as a cornerstone to the good management of coastal resources in an integrated manner and mainstreaming environment into the development planning process. The Environment Protection Act 2002, establishes an ICZM Committee. It was set up in 2002 and comprises Ministries, parastatal bodies, NGOS and Private sector. In 2010, an ICZM Framework was developed including ICZM Action and Area Plans, ICZM Strategy, ICZM legislative and Policy Framework amongst others.

Some of the activities implemented under the ICZM approach include the protection and rehabilitation works at several eroded public beaches around Mauritius.

The potential for eco-tourism has also been highlighted, particularly as a means of developing alternative livelihood opportunities amongst coastal farmers. Thus, while rapid coastal development especially through real estate projects could become problematic, there are clearly strengths and opportunities through which the sector could sustainably develop in the future.

Addressing coastal erosion

Coastal erosion has been an ongoing problem since the 1960s and it is believed that coral loss has amounted to up to 50 per cent over the last decade. To prevent further degradation, coastline protection and rehabilitation works comprising 'hard', 'semi-hard' and 'soft' measures such as rock revetment, gravel nourishment, use of geobags, and sand nourishment have been completed at several critical sites, namely Flic enFlac, Blue Bay, Belle Mare, Palmar, Grand Baie, Poudre d'Or, Cap Malheureux cemetry, Quatre Soeurs, GRSE, Bain Boeuf, Baie du Cap, La Prairie, Le Morne, Roches Noires, Troud 'Eau Douce, Grand Sable, Bois des Amourettes, Riviere des Creoles, Pomponnette, Grand Port, Trou aux Biches and St Felix, among others.

Reducing coastal pollution

Sewerage discharge and plastic pollution poses a serious threat to the Mauritian marine life and also have transboundary impacts. To give effect to the International Convention for the Prevention of Pollution from Ships (MARPOL), Mauritius has implemented a complete ban on the disposal of any form of plastic into the sea. It has also banned the use of plastic bags in the hope of reversing environmental damage caused by the indiscriminate disposal of plastic bags (MESDD, 2019).

Other activities included coordinating response to environmental disasters in the coastal zone namely tsunami and oil spills. In this regard, a National Oil Spill Contingency Plan and a Coastal Sensitivity Atlas for Oil Spill Response in 2003 were developed. Mauritius has also signed up to the International Convention for the Prevention of Pollution.

Reduce ocean acidification

The increasing levels of carbon dioxide in the atmosphere is a leading cause of the lowering of the pH of the oceans. It is one of climate change's most serious impacts. It puts many marine species at risk also leading to increased coral bleaching. While the long-term global goal must be to mitigate the CO₂ emissions causing the acidification in the first place, the immediate priority is to learn more about what's going on right now, and to act and adapt as effectively as possible in response.

There is opportunity to invest in building the capacity of the government to monitor, understand and respond to the issue of ocean acidification; and is an area to be actively pursued. Interventions could include development of monitoring kits, training of scientists, research and support for policy at national and regional levels.

Protecting mangroves

The Fisheries and Marine Resources Act 1998, provides for the protection of mangrove species. Other projects and programs have been designed by the government to deal with some of the environmental issues raised. For example, the Mangrove Propagation Programme has been highly successful in offsetting past mangrove depletion.

Sustainable fisheries

The situation

In 2019, GDP stood at \$ 11.7 billion, with the fishery sector playing a significant role and with huge potential for growth (MOEMRFS, 2017). In 2017, the fishery sector grew by 4 per cent contributing approximately Rs 4 billion to the Mauritian economy. According to the World Bank, the total fisheries production in Mauritius sits at 16300 metric tons. The average annual capture growth between the year 2000-2015 was estimated at 3.2% with the aquaculture growth being estimated at 15.7 per cent (World Bank, 2017).

Target 14.4: Sustainable fishing

UN definition: By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

The challenge

Capture fishery

Fisheries and aquaculture play an important socio-economic role in Mauritius. The country's per capita fish consumption was estimated at 23.2 kg/person/year in 2016. In light of this great contribution, an independent Fisheries Ministry was established in 2012.

The capture fisheries are from artisanal fisheries around Mauritius and Rodrigues Islands and from semi-industrial operations on Saya de Malha and Chagos fishing banks; and in 2017 amounted to about 25,000 tonnes. Current exploitation has reached a maximum and now the focus is on managing sustainable production and value addition on the fisheries in these fishing banks. Exports in 2017 of fish and fishery products were valued at US \$434 million and in the same year, imports of tunas for local consumption and for re-exports accounted for almost 65 percent of total imports of fish and fishery products (US \$368 million) (FAO, 2019).

Joint -venture and high-seas fishing are also important. Mauritius has developed into a Seafood Hub and a centre of fishing business in the Western Indian Ocean. It has integrated shipping, reefer vessel charter, quay space, cold storage, and seafood processing, marketing and distribution into a special zone. In 2017 the fleet was estimated to contain 1 731 vessels, most undecked. Total fisheries employment was 29,055 people. About 99 per cent of these were marine coastal fisheries with the remainder in full-time deep-sea fishing. Four percent of the people employed in marine coastal fishing were women.



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Source: (FAO FishStat, 2019)

Aquaculture

Although practiced for long in Mauritius, aquaculture production increased greatly in 2004 from 50 tonnes in previous years to 350 tonnes. This was due to the development of marine cage culture for

Red drum. In 2017 aquaculture production reached about 1,250 tonnes and the two major species produced are Red drum grown in marine cages and European seabass (FAO, 2019). Aquaculture is through to employ about 129 people of which 18 percent are women.



Source: (FAO FishStat, 2019)

The constraints

Food Security

All the artisanal fisheries catch and 90 per cent of the bank's fisheries catch is consumed domestically with local fish consumption at 23kg per capita per annum (Morgan, 2011). In 2019, total fisheries production was estimated at 16,300 metric tons against a domestic market demand of 29,400 metric tons (Morgan, 2011) (World Bank, 2017). This deficit means that Mauritius has to import fish to maintain domestic supply. The growing population, high food prices, climate change and poverty being the overarching threats to food security. The demand for fish is expected to grow and this is a concern as in some areas fishing effort is at the maximum sustainable yield.

Figure 4: Total imports and exports of fish and fishery products for the Republic of Mauritius (USD 1)



Source: (FAO FishStat, 2019)

Illegal, unreported and unregulated (IUU) fishing

Mauritius has a vast EEZ and the surveillance of this area is indeed a challenge. The fisheries resources of concern in most of the EEZ is the tuna fishery which forms the basis of an important local fish processing industry in the region. There is evidence of illegal fishing activities in the waters of Mauritius as reported in by Fish-i Africa (Stop Illegal Fishing, 2017).

Low investment in the fisheries sector

There are a number of areas that require attention if the fisheries sector is to be revitalized. These include greater attention to the current monitoring programs, including fisheries and Marine Protected Areas, compilation of Fisheries Management Plans for all of the fisheries sectors and greater funding and attention to the enhancing research capacity. Although there is an existing Aquaculture Master Plan to guide the sector, it appears to encourage only large-scale mariculture activities, excluding the small-scale operators and investors from benefitting directly from mariculture activities at a local level.

The opportunity

Sustainable management of the fishery resource

Mauritius has set in motion a number of initiatives to ensure sustainable fisheries with the overriding principle in government strategy for fisheries is managing capture fisheries within sustainable limits while ensuring continuous and even supply of fish and fishery products for the local market. In overexploited stocks, the fisheries are closed to newcomers and existing fishers are being encouraged to move to other fisheries.

In the case of capture fisheries where the resources are not being optimally tapped, development incentives are given to prospective investors. Coastal and banks fisheries are closed to foreign companies. For the highly migratory tuna, fishing agreements are in place with the EU, Seychelles (on a reciprocity basis) and Japan for fishing within the Mauritian EEZ. All foreign vessels need to have a licence to fish in Mauritian waters. Local investment and joint ventures are also encouraged in tuna fisheries.

Managing artisanal fishery

The fishing effort in the traditional sector needs to be substantially reduced to ensure sustainability of the resources. Consequently, fishers are being trained to participate in the offshore fisheries and to enable them to seek employment opportunities on foreign fishing vessels fishing in the EEZ under licence in the longline and purse seine fisheries. Some 1 000 fishers may need to be trained to meet the requirements of the industry in the next decade.

Legal and policy interventions

Government policy in the fisheries sector focuses on sustainable resource use and protection of the marine environment (i.e. management aspects) and on maximizing returns from existing fisheries through value addition. In parallel, government policy seeks sound development and improvement of the economic and social status of the fisher community. Mauritius is party to, inter alia, the United Nations Conference on the Law of the Sea (UNCLOS); the UN Agreement on Conservation and Management of Straddling and Highly Migratory Fish Stocks; the Convention on Biological Diversity (CBD); and abides by the principles enunciated in the FAO Code of Conduct for Responsible Fishing. Mauritius is a member of COMESA and SADC, and both bodies have as main objectives an increase in fish production in order to attain self-sufficiency, as well as to promote trade in fish and fishery products within and outside the SADC and COMESA regions.

Addressing IUU

Mauritius participates in FISH-i Africa an initiative to address IUU fishing. Fishing licences are issued to authorise local and foreign fishing vessels to fish in the EEZ, under the provisions of the Fisheries and Marine Resources Act 2007. In 2009, around ten countries were issued fishing licences. Mauritius signed fishing agreements with Seychelles in 2005 and the Japan Tuna Fisheries Cooperative Association in 2007. In 2009, the annual revenue from such licences and fishing agreements was around Rs. 40 million. In an effort to combat illegal, unreported and unregulated fishing in Mauritius, a National Plan of Action based on the International Plan of Action, has been developed with the assistance of the Government of Norway to prevent, deter and eliminate illegal, unreported and unregulated fishing.

Expansion of mariculture

There are opportunities for further expansion for mariculture farming for example in Rodrigues the extensive lagoon would be used for seaweed and sea cucumber farming. The government has also been highly proactive in the mariculture and small scale fishery sectors, particularly evident in the small-scale fishery where duty concessions and the provision of soft-terms loans have been utilized to support the sector.

Conserve coastal and marine areas

The situation

Mauritius supports a rich biodiversity of flora and fauna and its strategic location in the Indian Ocean confers upon it rich mangrove and wetland coastal zones, fringing coral reefs and lagoon corals. The rich marine biodiversity supports about 159 species of scleractinian corals and 340 species of fish. About 160 genera of alga and 17 mammals have been identified in the Mauritian marine waters. With the total Mauritian coral reef being estimated at 870 km², about 40 per cent of the coral cover is located in the lagoon (World Bank, 2017) (ROM, 2016). Its threatened flora is made up of about 691 species, consisting 150 Mascarene endemics and 272 single island endemics. Its fauna consists of native bats, nine endemic bird species, butterflies and snails (ROM, 2016).

Target 14.5: Conserve coastal and marine areas

UN definition: By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

Status:

Average proportion of Marine Key Biodiversity Areas (KBAs) covered by protected areas was 10 per cent in 2000 increasing to 11.75 per cent in 2018.

Protected marine area (Exclusive Economic Zones) in 2018 was 49.6 km²

In addition to the marine biodiversity, Mauritius also has a freshwater biodiversity, which boasts natural lakes, rivers and marshy areas. The total internal freshwater resource per capita sits at 2,182 per cubic metres with a withdrawal of 26.4 per cent of the internal freshwater resource. About 68 per cent of the total freshwater withdrawal supports the Mauritian agricultural sector. The abundant freshwater resource translates into 100 per cent access to improved water source among the rural and urban population (World Bank, 2017).

The challenge

Land use/land cover change

The 17th century witnessed the uncontrolled extraction of timber and massive conversion of land into agricultural land necessary for sugarcane development (GEF, 1995). The unchecked exploitation of high quality hardwood forests and rapid expansion of the sugarcane industry culminated into a decline in the freshwater and wetland extent, and native forest cover (MAIFS, 2017b).

Marine degradation protected areas

Lack of specialized monitoring equipment and personnel to survey the EEZ and continental shelf. This limitation affects the availability of data pertaining the marine biological diversity. Lack of private and public funding to employ and train specialized staff.

Difficulty in monitoring seagrasses, turtles and coral reefs on the remote outer islands. Illegal, unreported and unregulated fishing has not only damaged sensitive marine ecosystem but also beckoned food insecurity.

There is also limited environment awareness as a result of limited funds, poverty, gender disparity and education levels, has hindered the participation of all Mauritians in achieving goal 14

The opportunity

Supportive legislative framework

Mauritius is a member of the Action groups on Coral Reef restoration and Plastic Pollution and is also cooperating with other countries to exploit the resources within its EEZ. It is finalising regulations to ban disposal of plastic at sea. This will give legal force to Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL) which was signed by Mauritius in 1995.

Marine Protected Areas (MPA):

The rich Mauritian biological diversity and its consequent loss has necessitated the designation of marine protected area to conserve the ocean life and other resources. This has been possible through a myriad of ways with the most effective one being legislation which not only establishes marine protected areas but also restrict a particular conduct for instance the Fisheries and Marine Protection Act. With funding assistance from the Global Environment Facility (GEF), Mauritius has been able to expand its protected area network to secure and restore sensitive ecological areas and endemic species.

Mauritius has two Marine Protected Area, namely, the Balaclava Marine Park and Blue Bay Marine Park. It has also established Voluntary Marine Conservation Areas (at Anse la Raie and Roches Noires), 5 Fisheries Reserved Areas, 6 Fishing Reserve and 4 Marine Reserve. The World Bank estimates that about 0.3% of Mauritius' territorial waters is Marine Protected Areas (World Bank, 2017). The surviving biodiversity, particularly the endangered species, calls for quick restorative responses. To this effect, Mauritius has taken a number of steps and has identified key targets necessary for the restoration of the threatened biodiversity.

Ramsar sites

There are three designated Ramsar Sites of International Importance in Mauritius - the Rivulet Terre Rouge Estuary Bird Sanctuary (declared in 2001), the Blue Bay Marine Park (declared in 2008), and the Pointe d'Esny Wetland (declared in 2011). The coral reef of St Brandon covers an area of 190 km², while Agalega has 100 km². The EEZ covers an area of about 2.3 million km². Mauritius also exercises jurisdiction jointly with Seychelles over 396,000 km² of Extended Continental Shelf in the Mascarene Plateau Region (Joint Management Area).

Convention on Biological Diversity

Mauritius became the first country to sign and ratify the Convention on Biological Diversity (CBD) on the 10th September 1992 (MAIFS, 2017). The ratification expressed Mauritius' readiness to conserve biodiversity, ensure fair and equitable sharing of genetic resources, and sustainable use of genetic components. The Mauritian Government expressed this commitment through the completion and approval of the 2006-2015 National Biodiversity Strategy and Action Plans (NBSAP) as required under Article 6 of the Convention on Biological Diversity.

In response to the 2020 Aichi Biodiversity Targets, Mauritius has identified and increased the proportion of protected area. It has proclaimed 3 Ramsar sites (the Blue Bay Marine Park, the Pointe d'Esny Wetland and Rivulet Terre Rouge Estuary Bird Sanctuary), 8 islet national parks, 6 fishing reserves and 2 marine parks (MAIFS, 2017). Rodrigues' marine protected area (MPA) is estimated at 59 square kilometres and has 4 marine reserves and 1 multi-use marine protected area (CBD, 2019). Plans are underway to proclaim 6 marine protected areas (MPAs) under the West Indian Ocean Marine Eco-Region Project (CBD, 2019).

Other actions to protect biodiversity include:

- Ratified the Nairobi Convention and Protocol for the Protection of Marine and Coastal Environment of the Western Indian Ocean from Land Based Sources and Activities (2010)
- Banned the extraction of coral sand
- Prepared the National Biodiversity Strategy and Action Plan 2017-2025
- Mauritius has significantly contributed towards the Agulhas and Somali Current Large Marine Ecosystems (ASCLME)
- Mauritius is committed towards addressing land-based sources of pollution through participation in the Western Indian Ocean-Land Based Sources (WIO-LaB) Project
- Mauritius has banned the extraction of coral sand
- A ban on the use of plastic bags
- A ban on the disposal of any form of plastic into the sea

Mauritius has enacted a number of law regarding marine governance as follows: Environment Protection Act (EPA) 2002, Fisheries and Marine Resources Act 2007, Aquaculture Business Activities Act, National Environmental Policy, 1999, Corporate Social Responsibility Policy, National Development Strategy of 2003 and 2008, Integrated Coastal Zone Management Plan (ICZM) of 2009, Mauritius Sector Strategic Plan on Tourism (2008-2015), and the Action Area Plans for the Tourism Zones.

Some of the laws put in place to protect the marine and coastal ecosystem includes:

Maritime zones, shipping and Marine economy

- Ratification of the Convention on the Law of the Sea, 1982
- Renewal of Protocol on Fisheries Partnership Agreement between EU and Mauritius
- The China-Mauritius Free Trade Agreement (FTA)
- Negotiations on the Comprehensive Economic Cooperation Partnership Agreement (CECPA)
- Increased the issuance of clearances to seafarers serving Mauritian and foreign vessels

Marine Spatial Planning

Mauritius is advocating for Marine Spatial Planning (MSP), a strategy whose aims is to organize the various use of marine resource. The Department for Continental Shelf, Marine Zone Exploration Administration and Exploration is spearheading the efforts to come up with an elaborate Marine Spatial Planning that will not only address sustainable development of marine resources and climate changes issues but also ensure stakeholder participation and precise geographical boundary definition. It is projected that the MSP strategy will strengthen and diversify Mauritian economic sectors, namely, tourism, fisheries, leisure and aquaculture.

Joint implementation

The 396,000 km² continent shelf over which Mauritius exercises sovereign rights is joint managed by with Seychelles. This was pursuant to the United Nations Commission on the Limits of the Continental Shelf conferred joint jurisdiction over the Mascarene Plateau Region to Mauritius and Seychelles in 2011. The unique collaboration between the two states ensures sustainable management through peaceful cooperation that minimize conflicting use of the marine space.

e-Procurement:

The introduction of e-procurement in Mauritius has facilitated electronic procurement proceedings from bid invitation to tender to contract award. E-procurement facilitates the use of ICT, shortens procurement cycle and lowers transactional costs. Hopefully, the introduction of e-procurement in the supply of ocean resources and fisheries will likely secure sustainable management.

Climate change

The situation

Mauritius is very vulnerable to climate change with effects being seen in the increasing frequency and intensity of cyclones, torrential rains and flash floods have also threatened people's livelihoods in the islands. The sea level in Mauritius has been raising at an average rate of 1.2 mm per year (MAIFS, 2015). Such a rate is detrimental not only the marine and coastal life but also to the coastal structure. Coastal erosion, and saline water intrusion are some of the other problems being faced. The impacts of warming on the waters affects coral which is a major tourist attraction, thus impacting the economy.

The challenge

Sea level rise and coastal erosion

Coastal erosion has been occurring as a natural result of the strong waves that accompany the cyclones, trade winds and southern swells that sometimes affect the Mauritian islands. However, since the 1990s, the rate of coastal degradation has appeared to accelerate due to the growth in tourism activities and coastal land development (Baird W.F and Associates, 2003). The increase in frequency of these storms as a result of climate change combined with sea level rise is likely to increase the rate of coastal erosion.

Salt water intrusion

Sea level rise is likely to have impacts on human and economic wellbeing through an increase in coastal flooding which can lead to salt water intrusion. This is likely to affect water security for the

27 per cent of the total population live within the coastal zone (Statistics Mauritius, 2019). There are likely to be impacts on economic activities as this is the area where infrastructure is well-developed and contributes to supporting the economic development of the country. Further impacts of salt water intrusion will be felt on the ecosystems such as wetlands and mangroves.

Sea temperature rise

The rise in the marine temperature also results in bleaching of the coral reefs resulting in a significant loss of live corals. The increase in temperature due to global warming, translates into a sharp increase in the seawater temperature, which facilitates micro algal bloom. These microscopic algae produce toxins and use up oxygen resulting into massive death of fish.

The constraints

Hotspot for disaster

Mauritius is a likely hotspot for disaster when an extreme climate related natural event hits. It is ranked 13th in the world with a world risk index of 15.53 per cent. Although the society is not so vulnerable, the exposure of the population, natural and built environment to climate related hazards such as cyclones, sea level rise among others is quite high. When combined with low adaptive capacity, this puts the country into the high-risk category. Mauritius is the 7th most exposed country in the world with an exposure rate of 37.35 per cent (UNU, 2016).

Inadequate shoreline protection

There is opportunity to address this through the construction of groynes and sea walls using hard engineering approaches so as to halt the weakening of coastal structures through coastal erosion (MAIFS, 2015). Some of these have been highlighted in the sections above.

The opportunity

Supportive legal and policy framework:

The effects of climate change on the key sectors of the Mauritian economy, tourism, fisheries and agriculture has been noted. There is opportunity to address some of the identified issues using the existing legal framework. The Environmental Protection Act (2002) is the overriding legislation that provides for management of coastal ecosystems including addressing issues of coastal erosion and guiding coastal development.

The Tourism Development Plan for Mauritius is the strategy that tourism sector which is driving the growth in Mauritian tourism. However, to minimize impact from this sector, it is important if the requirement for Environment Impact Assessments is enforced and mitigation measures monitored to ensure minimal impacts on the coastal zone. Other important policies include the National Development Strategy, Policy and Planning Guidance for Coastal Development produced by the Ministry of Housing and Lands

Mauritius has also ratified the United Nation Framework Convention on Climate Change (UNFCCC) and the United Nation Convention to Combat Desertification.

Sustainable tourism:

Tourism is a major contributor to the economy and to livelihoods. To maintain this critical role the government needs to ensure the sustainable management and preservation of coastal zones. Furthermore, they should promote eco-tourism by encouraging tourism operators to adopt new technologies such as renewable energy and energy saving equipment.

Coastal reforestation programmes

Mangroves are a natural and important component of the coastal ecosystem contributing to the ecological food web, habitat for biodiversity and providing physical protection of the coastline. The Ministry of Fisheries has actively implemented a mangrove propagation program mainly on the Southwest and south east coast. This should continue and even be expanded to include some of the coastal roads such as on the Southeast coast in the areas of Bambous Virieux, Petit Sable and Quatre Soeurs. In places where mangrove restoration may not be possible, there is opportunity for other coastal erosion protection works may be considered.

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