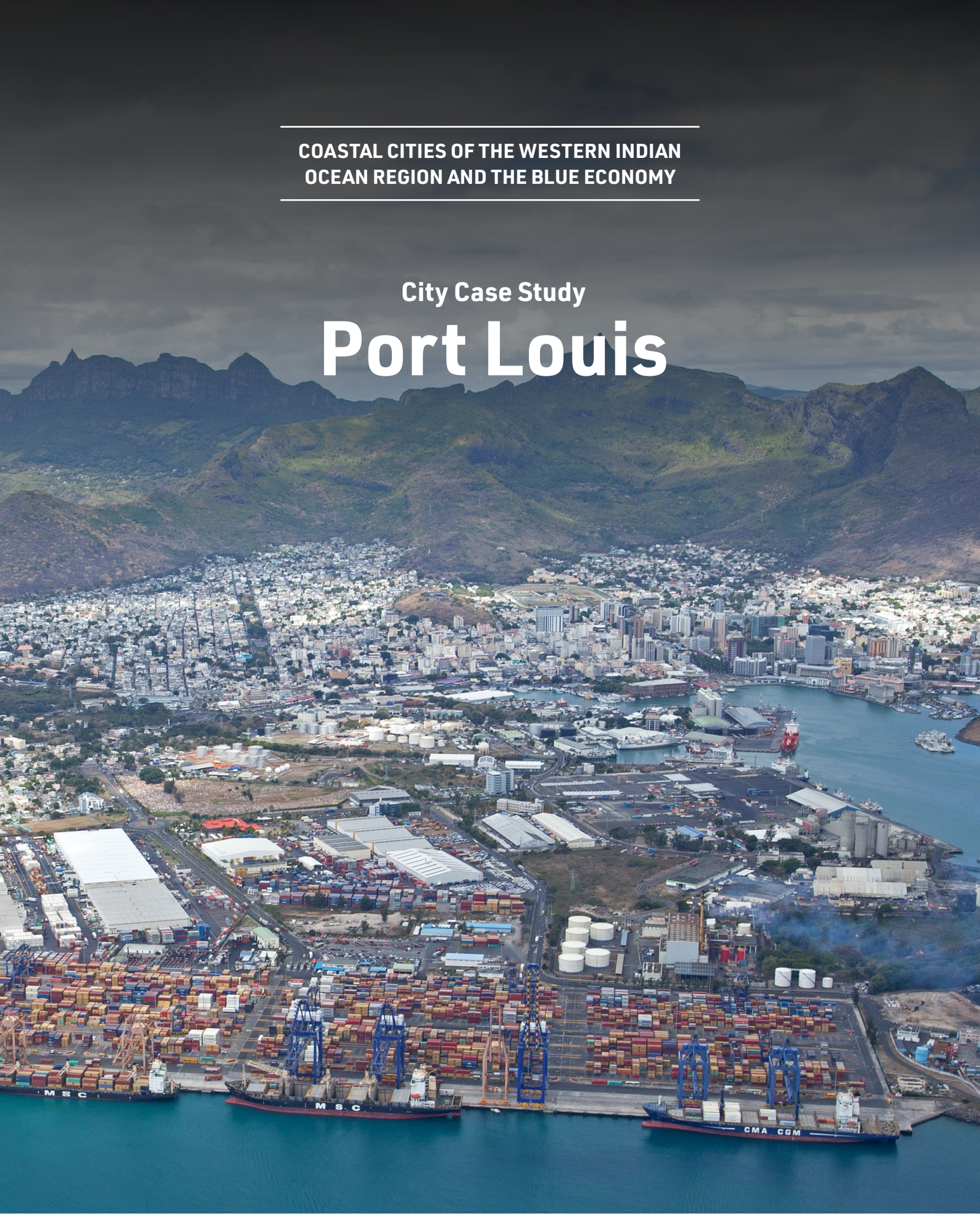
COASTAL CITIES OF THE WESTERN INDIAN OCEAN REGION AND THE BLUE ECONOMY

City Case Study

Port Louis



WIOMSA
Coasts Ocean and People
WESTERN INDIAN OCEAN MARINE SCIENCE ASSOCIATION

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The production of these reports reflects the new collaborative efforts between WIOMSA and UN-Habitat, aiming at better understanding the linkages and interdependencies between environment, society and economy in coastal cities.

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Furthermore, in publications such as these, many individuals and institutions provided support and technical inputs in many different ways. It is impossible to list all of them by name, but their support and inputs are individually and collectively much appreciated.

▸ Image:Pointe aux Sables, Port Louis

ACRONYMS

BE – Blue Economy

BMU – Beach Management Unit

CBOs - Community-based organizations

COP – Conference of the Parties

CSO - Civil Society Organization

DRR – Disaster Risk Reduction

EDB - Mauritius Economic Development Board

EEZ - Exclusive Economic Zone

EIA – Environmental Impact Assessment

ESIA - Environmental Social Impact Assessment

EU - European Union

FDI - Foreign Direct Investment

FTZ - Free-trade zone

GDP – Gross Domestic Product

GIS – Geographic Information Systems

GMP – Gross Marine Product

ICT – Information and communications technology

ICZM - Integrated Coastal Zone Management

IFRC – International Federation of Red Cross and Red Crescent

IFZ - Industrial Free Zone

LMMAs - Locally Managed Marine Area

MPA – Marine Protected Area

MSP – Marine Spatial Planning

NGOs - Non-Governmental Organisation

OECD - The Organisation for Economic Co-operation and Development

PLDI - Port Louis Development Initiative

PPP - Public Private Partnership

SDG – Sustainable Development Goal

SEZ - Special Economic Zones

SIDS – Small Island Developing States

SMMEs - Small, Medium and Micro Enterprise

SWOT – Strengths, Weaknesses, Opportunities, and Threats

TVET - Technical & Vocational Education & Training

TEU – Twenty-foot Equivalent Unit

TEWF - Ministry of Tourism's Tourism Employee Welfare Fund

UNECA – United Nations Economic Commission for Africa

UNEP - UN Environment Programme

UNICEF - United Nations Children's Emergency Fund

USD - United States Dollars

WIO – Western Indian Ocean

WIOMSA – Western Indian Ocean Marine Science Association

WWF - The World Wildlife Fund

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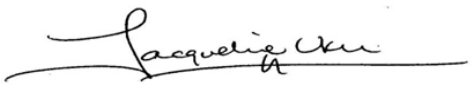
FOREWORD

Although cities only represent 2 percent of the world's geographical area, the activities within their regional boundaries use over 75 percent of the planet's material resources, according to a study released by the International Resource Panel in 2018. This among other reason is why the UN in 2015 approved a stand-alone Goal, SDG 11, Sustainable Cities and Communities, which recognizes urbanization and city growth as a transformative force for development. This is the first-ever international agreement on urban-specific development and acknowledges that sustainable urban development is a fundamental precondition for sustainable development in general.

Coastal cities are the location for high levels of economic activity mainly because of their association with ports, waterfront development and well-endowed coastal and marine environment. In the Western Indian Ocean (WIO) region, some of the coastal cities are capitals of respective countries (e.g. Victoria, Seychelles; Port Louis, Mauritius and Maputo, Mozambique) while some are important hubs of trade, industry and commerce, such as Mombasa, Dar es Salaam, Beira and Durban. For the most part, some of these cities are experiencing comparatively rapid population and economic growth, which is known to have negative impacts on the natural environment through resource extraction and use, as natural resources come under increasing pressure. Climate change and the anticipated increase of extreme events exacerbates the problem, , with the UN-Habitat's State of African Cities Report suggesting that sea-level rise threatens the very survival of some of these cities. Cities with large proportions of economically and socially vulnerable inhabitants, such as Port Louis, Maputo, Dar es Salaam, Victoria, and Mombasa, are particularly susceptible.

The Blue Economy is an emerging policy area that is subject to ongoing political discussions at the global and regional levels. In 2018, Kenya hosted the first high-level international Sustainable Blue Economy Conference. The Blue Economy seeks to promote economic growth, responsible production and consumption, social inclusion, preservation and improvement of livelihoods while at the same time ensuring environmental sustainability of ocean and coastal systems, as well as other waterfront areas, through the circular economy. UN-Habitat published a report on "The Blue Economy and Cities", highlighting the need to recognize the role of urbanization and urban planning in shaping the Blue Economy. This underscores the urgency of including urban policymakers in the global discussions around the Blue Economy concept.

Since 2018, with the funding from the Government of Sweden, WIOMSA has been implementing a five-year project, Cities and Coasts project, whose goal is to build and strengthen human and institutional capacity in coastal and marine planning for sustainable coastal cities in the WIO region. Through this project, WIOMSA, in collaboration with UN Habitat commissioned a series of studies to explore the current relationship between coastal cities of the WIO region and the blue economy, challenges and opportunities and offer recommendations moving forwards.



Dr Jacqueline Uku, President of WIOMSA

PREFACE

The linkages between environment, society and economy in coastal cities are important in the countries of the WIO region, and there is a need to understand better their interdependencies and the associated constraints to sustainable development. If managed properly, cities can offer better socio-economic conditions and quality of life to residents and the wider context in which they are situated effectively facilitating sustainable cities and the communities. The integrated adaptive management and sustainable development of coastal cities and their marine environment are therefore essential.

At the Ninth Conference of Parties to the Nairobi Convention (COP 9) August in 2018 in Mombasa, countries of the region acknowledged for the first time the importance of collaborating with UN-Habitat to address the environmental challenges and opportunities posed by rapid urbanization, particularly in coastal cities in the WIO region, as articulated in the SDG 11 ("make cities and human settlements inclusive, safe, resilient and sustainable" (Sustainable Cities and Communities)) and the New Urban Agenda (NUA) on sustainable cities and communities. Further, COP 9 urged Contracting Parties to consider undertaking climate change vulnerability assessments of their urban coastal areas, including urban spatial planning processes, and integrating marine natural capital (Decision CP.9/9). The Nairobi Convention Secretariat was requested to collaborate with UN-Habitat and other partners to develop a regional action plan and roadmap to assist the Contracting Parties in integrating the NUA into coastal cities in the WIO region for the protection of the marine and coastal environment (Decision CP.9/13). Furthermore, countries agreed to advance Blue Economy approaches in SDG 14 as a pathway for sustained incomes and economic benefits from natural blue capital including fisheries, tourism, oil and gas development, offshore renewable energy, and other maritime activities.

As part of the implementation of these decisions and to provide a greater understanding of the local challenges and opportunities faced by coastal cities in the WIO region and to support the future development of an environmentally sustainable and socially inclusive roadmap for the Blue Economy, WIOMSA and UN-Habitat commissioned Arup to prepare a portfolio of six reports:

- Four blue city economy case studies;
- A 'Status Report' which outlines more broadly the current situation concerning the blue economy in coastal cities across the region; and
- A 'Roadmap for the Development of the Blue Economy in Coastal Cities', which provides recommendations for cities in current and future blue economy planning, activities and investment.

These reports offer knowledge resources for city and national government stakeholders, WIOMSA, UN-Habitat, private sector and civil society.
Each case study provides specific blue economy recommendations for that city, focusing on strategic and operational opportunities for the city and its blue economy stakeholders, informed by primary and secondary research. Key points and recommendations from each case study have also been extracted and integrated into the main body of the Status Report, which has, in turn, informed the Roadmap. The Roadmap provides strategic and operational blue economy recommendations across case study cities, which stakeholders are encouraged to also read and consider with respect to their city or region.

The Port Louis report is one the case study reports for coastal cities, others being Kilifi and Mombasa, Kenya and Dar es Salaam, Tanzania. Key Informant Interviews and Focus Group Discussions were the primary means of field investigation for these reports and engaging key stakeholders across blue economy sectors and stakeholder types (government, academia, private and civil society). Stakeholders were identified through city-specific desktop research, undertaken in January/February 2020.

Oumar Sylla
(Director Regional Office for Africa - UN Habitat)

Arthur Tuda
(Executive Secretary - WIOMSA)

CHAPTER 1

CITY OVERVIEW

Port Louis as the island capital, economic hub and political headquarters of Mauritius, plays an outsized role in the national economy. It is the location of the nation's major port, making it key to key blue economy sectors such as maritime trade and tourism. Port Louis is the most populated region in Mauritius and is heavily industrialised, in part related to direct and indirect port harbour activities.

▸ Image: Port Louis Skyline. (C) carrotmadman, Flickr

1.1. CITY OVERVIEW

Port Louis is Mauritius' economic hub and largest city, with a resident population of 155,226 and an additional transiting working population of some 100,000 to 200,000.[1,2] The combined population of Port Louis and the next four largest settlements on the island—a conurbation that extends south along the M2 highway towards Sir Seewoosagur Ramgoolam International Airport —includes nearly 43% of the country's total population. Port Louis plays an outsized role in the national economy and the city's key 'blue' industries—maritime trade, tourism and fishing or fish processing—are key to the island's future prosperity. For example, Port Louis handles 99% of Mauritius' external trade and has become an important hub for transhipment of containers between other countries.[3]

Port Louis is also the site of many of Mauritius' business (and government) headquarters and therefore a focal point for human and financial capital on the island. Jobs located in the capital are often filled by residents of nearby cities or suburbs. Conversely, manufacturing, tourism and aquaculture activities located beyond the city limits provide inputs in the form of goods, people and fish products, which are necessary to support the city's key industries.

Port Louis has been both a driver and beneficiary of Mauritius' recent push towards a service economy. Mauritius is now the third largest economy in Africa by per capita GDP, the result of decades-long structural transformation away from traditional or low-skilled employment such as agriculture and manufacturing, and towards knowledge-intensive and service-oriented sectors.[4] Today, the island's economy is largely service-based (76% of GDP in 2019), followed by industry (21%) and agriculture (3%).[5] Port Louis is the island's business centre, home to its financial services industry and close to the island's major universities, the University of Technology, Mauritius and the University of Mauritius.

All three of the city's key blue industries cluster around the Port Louis harbour. Land around the harbour is owned by public or semi-public organisations: a national ministry, the Ministry of Housing and Land Use Planning; and a parastatal organisation, the Mauritius Ports Authority. The Ministry of Housing leases waterfront property to developers including Landscope, a public company whose largest shareholder is the Government of Mauritius; and private companies—Caudan Development Limited, United Docks, and Le Suffren Hotel and Marina. The Ports Authority also leases land to various individual operators within the port.

From an environmental perspective, poor land use planning combined with historic population growth have resulted in gradual migration of some people to higher elevation zones inland. The city is located between coast and mountain and urban expansion has led to increased environmental pressure and degradation, as well as increased landslide risk for those residing (some informally), in higher risk zones.[6] The city also increasingly experiences flash flooding including an event in 2014 in which 11 lives were lost.[7]

A fishing reserve was enacted off the coast of Port Louis in the year 2000. It covers 331 hectares from Terrason, southwest of the city centre.[8] Marine Parks with wider restrictions exist elsewhere off the island, with the nearest area being the Balaclava Marine Park located approximately 10km north of Port Louis.[9]

1.2. RESEARCH METHODOLOGY

Port Louis primary research took place in the first week of March 2020.

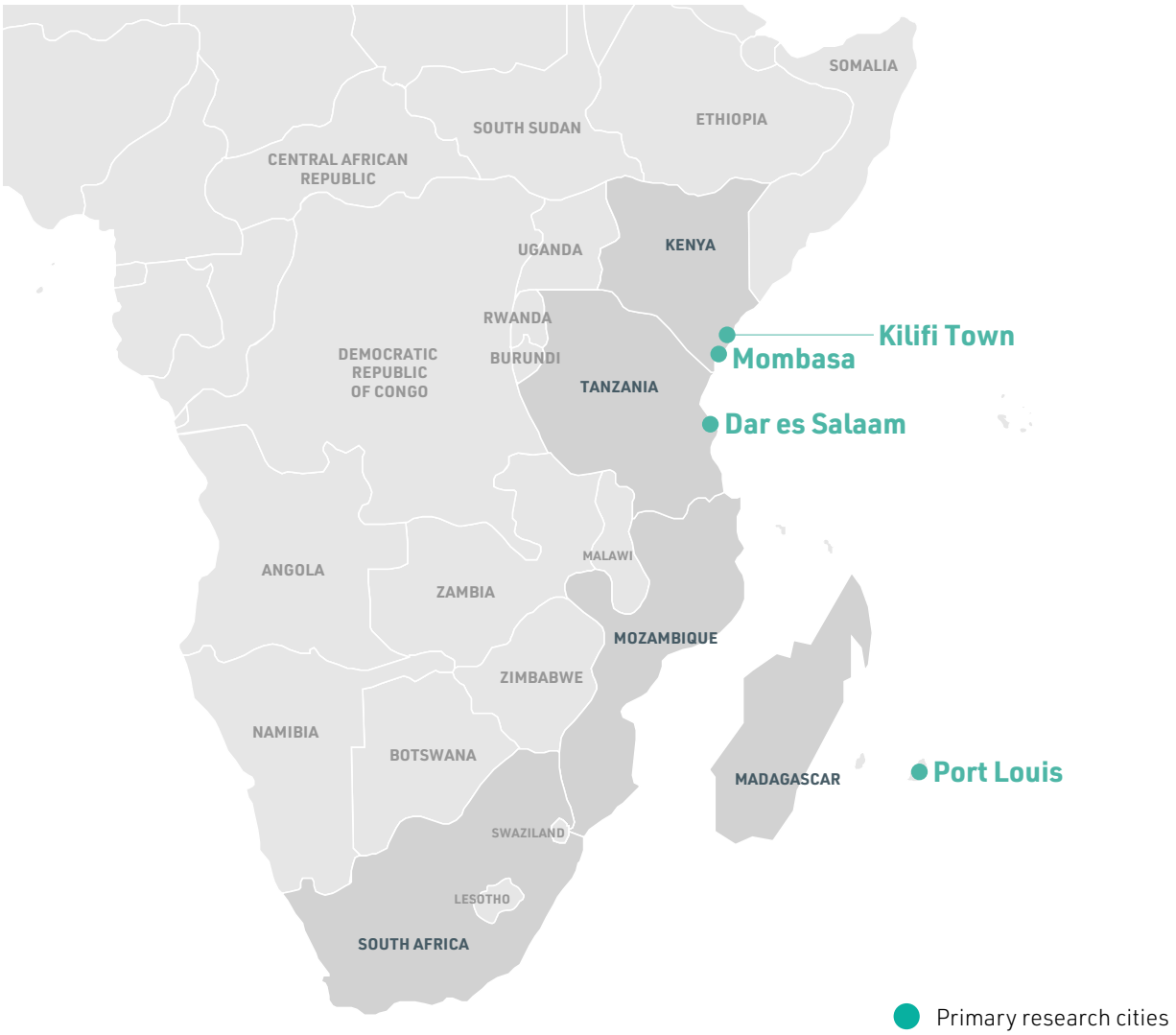
Selection of case study cities was agreed upon between Arup, WIOMSA and UN-Habitat in January 2020 based on learning from the desktop phase.

Specific factors which influenced case study selection are as follows:

- A desire to select at least one mainland and one island city;
- Selection of cities which allowed exploration of key blue economy themes that emerged in the desktop research phase (a port city, a tourism hotspot, a city with strong fishing sector connection and a rapidly growing smaller city);
- Logistics with respect to travel and availability of interviewees.

The selection process resulted in choosing of Dar es Salaam, Port Louis, Mombasa and Kilifi Town.

FIGURE 1 - CASE STUDY LOCATIONS



Key Informant Interviews and Focus Group Discussions were the primary means of field investigation, engaging key stakeholders across blue economy sectors and stakeholder types (government, academia, private and civil society). Stakeholders were identified through city specific desktop research, undertaken in January 2020, which also established initial lines of investigation.

Field research analysed the economic, social and environmental dimensions of major blue economy industries using a SWOT method to gain an in depth, balanced understanding of the city-blue economy relationship. Semi-structured questioning was used to ascertain stakeholder thoughts on overarching city blue economy strengths, weaknesses, opportunities and threats, before exploring specific blue economy sectors with which the stakeholder was involved (e.g. fishing, tourism and maritime transport and shipping).

In Port Louis 16 stakeholders were consulted from 12 organisations:

TABLE 1 - MAURITIUS ORGANISATIONS AND/OR INSTITUTIONS CONSULTED

1	School of Sustainable Development and Tourism; University of Technology, Mauritius
2	Faculty of Agriculture, University of Mauritius
3	Mauritius Ports Authority
4	Ministry of Blue Economy, Marine Resources, Fisheries and Shipping
5	Ministry of the Environment, Integrated Coastal Zone Management (ICZM)
6	Indian Ocean Rim Association (IORA)
7	Associate Arup SIGMA
8	Reef Conservation
9	Ministry of Tourism
10	Economic Development Board, Mauritius
11	Municipality of Port Louis, Planning Division
12	Albion Fisheries Research Centre

CHAPTER 2

THE BLUE ECONOMY IN PORT LOUIS

The city's key blue economy industries are maritime trade, fishing and tourism, discussed hereafter. Waterfront development, also addressed in the next section, is considered closely related to the city's tourism sector, while marine biotechnology is a growth industry which is also briefly discussed. These sectors depend on the wider operational environment in Port Louis, which is also discussed in the following section.

▸ Image: Aerial Port Louis (C) Ryan Chan Yam, Shutterstock

INFOGRAPHIC: MEASURING THE BLUE ECONOMY IN PORT LOUIS

The below industries are important to the economic health of the capital but are also critical drivers of the national economy. For example, Port Louis is the gateway into the island, responsible for 99% of the goods entering and leaving Mauritius. In this way—and in a similar manner to other capitals of small island nations in the WIO region—the city plays an outsized role in the national economy and it can be difficult to draw clear distinctions between the two.

SECTOR SPECIFIC BLUE ECONOMY CHALLENGES AND OPPORTUNITIES

Port and Maritime Trade	• Port-related activities account for approximately 9,000 jobs nationally, most of which are located in Port Louis. • The Port of Port Louis handles 99 % of the country's external trade, and port-related activities account for around 2% of the country's GDP.
Tourism	• Nationally, the tourism industry accounts for roughly 7% of total GDP and 10% of total employment in Mauritius. However, the sector is largely based outside of Port Louis.[10]
Fishing and Aquaculture	• According to the Ministry of Blue Economy, Marine Resources, Fisheries & Shipping, as of March 2018, fishing and aquaculture employed 117 Mauritians as full-time professional fishermen but there are many more artisinal fishers and an estimated 20,000 unregistered amateur fishermen nationally but mainly outside of Port Louis. • Fish processing employed an additional 4,987 people, many focused in Port Louis.[11,12] 150,000 tonnes of fish are handled in the port of Port Louis each year.
Waterfront Development	• Le Caudan Waterfront, the largest mixed commercial development along the Port Louis waterfront, is valued at approximately 88.5M USD (3.5bn 9MRs).[13] A second large commercial development is currently underway in an adjacent site.

OPERATIONAL ENVIRONMENT FOR THE BLUE ECONOMY

Solid Waste Management	• Solid waste management for Port Louis is under the direct control of municipality of Port Louis but is restricted to collection and transport to a transfer station. From the transfer station, the waste is then disposed of at Mare Chicose landfill. Port Louis and its suburbs generate an average of 6,308 tonnes of solid waste monthly with 64 % being of organic origin, 13% paper and 12.4% plastic wastes.[14]
Climate Change Adaptation	• Mauritius is vulnerable to 1 percent chance of losses exceeding USD$1.9 billion each year, due to storms.[15] • Port Louis is at risk from sea level rise, which has averaged 3.8 mm/year over the last five years, an increase from previous years recorded.[16]

2.1. BLUE ECONOMY GOVERNANCE AND PLANNING

Mauritius is widely considered to be among the best governed countries in the region, with high rates of citizen participation, human development and strong rule of law, and with low levels of corruption. Since independence in 1968, Mauritius has been a multi-party democracy, and the Ibrahim Index of African Governance (IIAG) ranks Mauritius first of 54 countries in Africa in its most recent ranking.[17]

Development and enforcement of policy relating to the blue economy (as with all national policymaking) rests with the Government of Mauritius. Twenty-four ministries are responsible for defining national policy and enforcing relevant legal frameworks which regulate use of marine areas and marine resources, including the Environmental Protection Act (2002), the Integrated Coastal Zone Management Framework (2010), Fisheries and Marine Resources Act (2007) and the Maritime Zones Act (2005).[18]

Mauritius' Ministry of Blue Economy, Marine Resources, Fisheries and Shipping is responsible for sustainable development of ocean resources and for managing the country's 1.9 million km^2 Exclusive Economic Zone (EEZ). It is therefore directly or indirectly involved in almost every aspect of Port Louis' blue economy, and–alongside other government ministries and private sector or parastatal organisations, is a major stakeholder in the city's blue economy. The mission of the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping mission is to "fully optimise in a sustainable manner the immense potential of [Mauritius'] Exclusive Economic Zone and develop the ocean economy as a new pole of growth."[19] The Ministry of Public Service, Administrative and Institutional Reforms, which houses the Department for Continental Shelf and Maritime Zones Administration and Exploration, is responsible for sustainable exploitation of offshore natural resources within Mauritius.[20] These activities are informed by Mauritius' national economic plan, which describes a goal for the blue economy to grow at an average annual rate of 5% up to 2020, then increasing to 7% until 2030.[21] The 2018 strategy prioritises tourism and fishing/aquaculture, with tourism as the main driver of economic growth and a key recipient of government support.

Marine Spatial Planning (MSP) is also the responsibility of national government. The Ministry of Blue Economy creates and enforces protected marine areas and is responsible for assessing the health of marine ecosystems and public outreach and sensitization. **Separately, the Ministry of the Environment, Solid Waste Management and Climate Change's Integrated Coastal Zone Management Division (ICZM) promotes cooperation between government actors, NGOs and the private sector around marine spatial planning.[22] Truly integrated planning is still a work in progress,** and almost entirely handled at the national level, despite wide recognition of the merits of MSP and broad support for MSP principles, Municipal governments have limited influence over marine spatial planning policies. Of 31 existing or proposed protected marine zones in Mauritius--including Marine Protection Areas (MPAs), Marine Managed Areas (MMA), marine parks, nature reserves, and designated fishing reserves–only the Port Louis Fishing Reserve is within or adjacent to Port Louis and is managed by the Ministry of Blue Economy.[23]

Local authorities have limited influence over decisions regarding environmental policy, economic policy or marine spatial planning related to the blue economy. With most responsibility for environmental, economic and spatial planning resting with government ministries, the Port Louis Municipal City Council is largely tasked with building and land use permitting, maintenance and upkeep of public infrastructure and providing basic city services to its 150,000 residents. The Council comprises 24 councillors and one mayor. As of 2019, the city council had 1,361 employees[24] and in 2018 its revenue was $23,196,719, the bulk of which (67%) came from grants from the central government, followed by property taxes (15%).[25] These funds are distributed to eight municipal departments: Administration, Finance, Land Use and Planning, Public Infrastructure, Public Health, Library, Parks and Gardens and Welfare. **Municipal government has some indirect impact on managing the blue economy by providing basic city services and maintaining infrastructure that is used by residents and tourists.** The council works closely with national ministries but lacks significant strategic or decision-making powers related to economic planning of blue economy sectors.

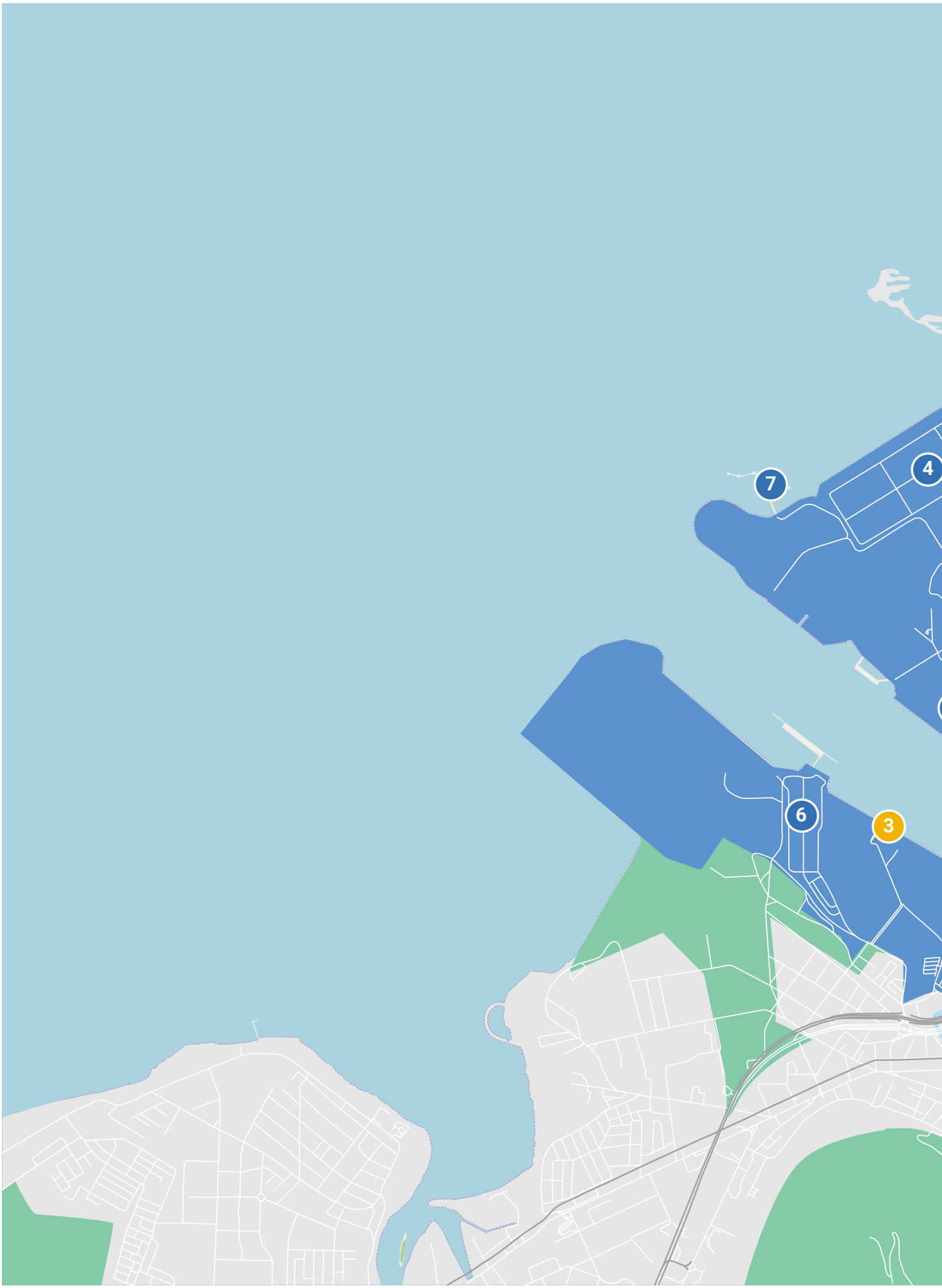
Upgrades to Port Louis are planned under the National Regeneration Programme[26], although plans nationally, to create a 'smart city' Cote-d'Or is felt by some, to be a potential challenge to Port Louis economically and administratively.[27] The Port Louis Development Initiative (PLDI) – a public, private and civil society consortium - notes the **growing role of the private sector in refurbishment and upgrade of parts of the city.[28]**

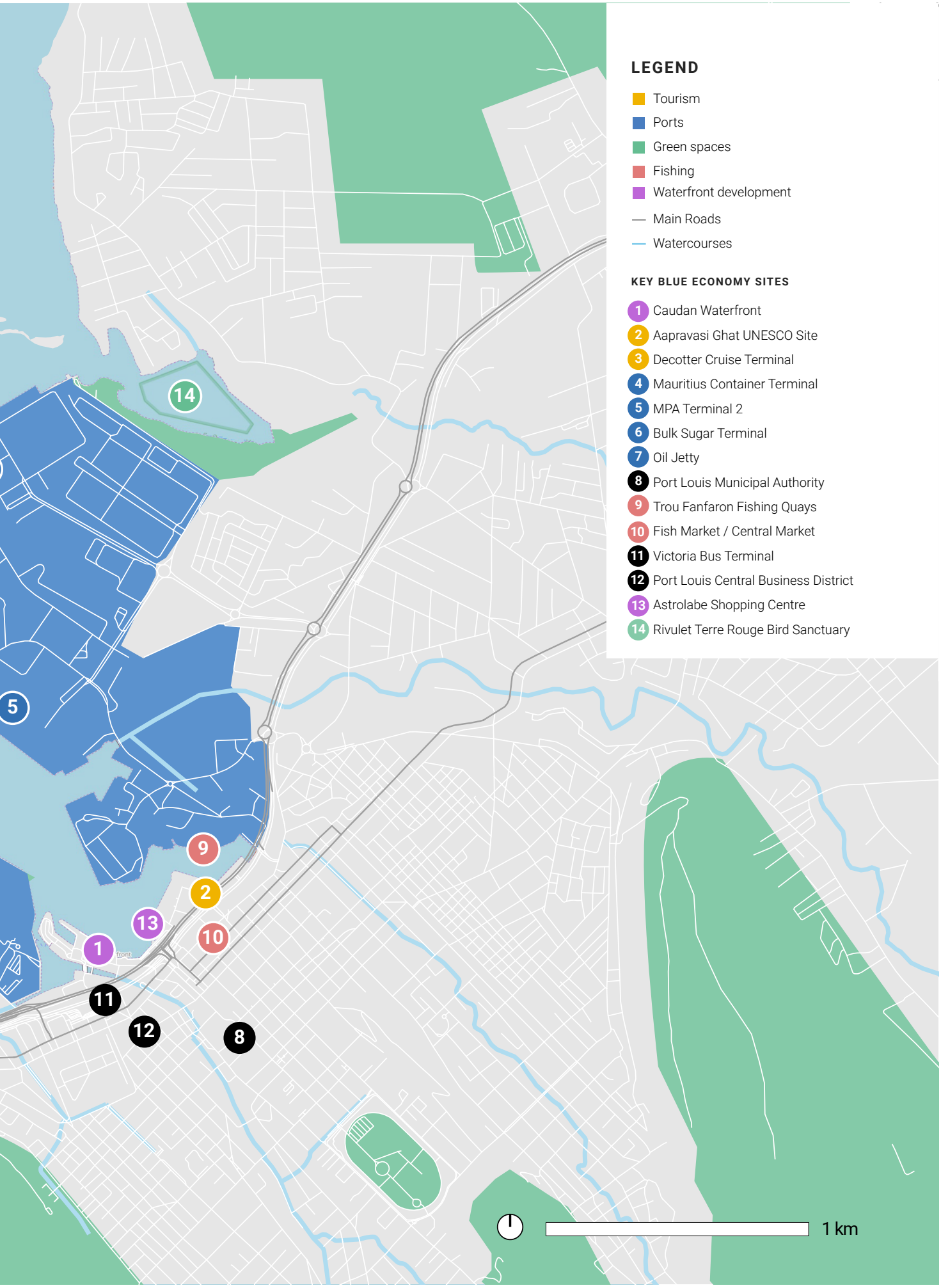
TABLE 2 - BLUE ECONOMY STAKEHOLDERS PER SECTOR

This matrix illustrates the complex network of blue economy stakeholders in Port Louis. This list is not exhaustive but describes certain major stakeholders in some key blue economy sectors.

	National Government	Local Government	Private Sector	Civil Society
Port and Maritime Trade	Ministry of Blue Economy, Marine Resources, Fisheries and Shipping (The Shipping Division, The Monitoring Control Surveillance/ Vessel Monitoring System/Port State Control and Import/Export Division, The Competent Authority Seafood. Ministry of External Communications	Municipal City Council Land Use and Planning Department	The Mauritius Ports Authority Cargo Handling Corporation Ltd. Mauritius Maritime Training Academy, Various fish processing companies	Seafarers' Welfare Fund
Fishing	Ministry of Blue Economy, Marine Resources, Fisheries and Shipping (The Shipping Division, Albion Fisheries Research Center, The Fisheries Training and Extension Centre, The Fisheries Protection Service, The Monitoring Control Surveillance/Vessel Monitoring System/Port State Control and Import/Export Division, The Competent Authority Seafood.	Municipal Council of Port Louis	Mauritius Tourism Promotion Authority, Tourism Authority, Mauritius Hotel and Restaurant Association (AHRIM) The Mauritius Ports Authority Le Suffren Hotel and Spa Landscope Mauritius Caudan Development Ltd	Tourism Employees Welfare Fund
Tourism	Ministry of Housing and Land Use Planning,	Municipal City Council Land Use and Planning Department	The Mauritius Ports Authority Caudan Development Ltd United Docks Le Suffren Hotel and Spa Landscope Mauritius	Centre for Community Initiatives
Waterfront Devt	Ministry of Water and Irrigation	Municipal Council Officers - Environment and Solid Waste Management Department	-	Centre for Community Initiatives
Marine Biotech	The Ministry of Blue Economy, Marine Resources, Fisheries and Shipping	-	Mauritius Oceanography Institute, University of Mauritius University of Technology Mauritius	-

FIGURE 2 - BLUE ECONOMY MAP – PORT LOUIS




LEGEND
Tourism
Ports
Green spaces
Fishing
Waterfront development
Main Roads
Watercourses
KEY BLUE ECONOMY SITES
1 Caudan Waterfront
2 Aapravasi Ghat UNESCO Site
3 Decotter Cruise Terminal
4 Mauritius Container Terminal
5 MPA Terminal 2
6 Bulk Sugar Terminal
7 Oil Jetty
8 Port Louis Municipal Authority
9 Trou Fanfaron Fishing Quays
10 Fish Market / Central Market
11 Victoria Bus Terminal
12 Port Louis Central Business District
13 Astrolabe Shopping Centre
14 Rivulet Terre Rouge Bird Sanctuary
1 km

2.2. SECTOR SPECIFIC BLUE ECONOMY CHALLENGES AND OPPORTUNITIES

The city's principle 'blue' industries are fishing, tourism, maritime trade and real estate/waterfront development. Marine biotech is a promising but less well-developed blue industry.

PORT AND MARITIME TRADE

Port Louis is the only port in the island of Mauritius (Port Mathurin serves the island of Rodrigues). **In 2018, the Port of Port Louis exported goods totalling roughly $2.4 billion**. The bulk of exports consisted of clothing including t-shirts (7.4% of total exports), shirts (6.9%), suits (5.8%), prepared or preserved fish (14.5%), frozen fish (6%) and cane sugar (7.3%).[29]

The port is a major employer in the city, generating 9,000 jobs as well as indirect employment throughout the region.[30] For instance, much of Mauritius' manufacturing sector is located close to the Port Louis urban area (e.g. in Vacoas-Phoenix and Le Tour Koenig) within easy access of the port.

The Mauritius Ports Authority (set up under the Ports Act 1998), is the sole national port authority and it regulates and controls the port sectors in the Republic of Mauritius, including Rodrigues and all outer islands.[31]

The Ports Authority is one of the largest landowners in the harbour and receives funding from two primary sources: fees from port services and rent from lease agreements from operators in the port – including shipping agents, bulk cargo operators, ship handlers, large-scale fishing, fish processing and support services such as ship repair and technology providers.

The Mauritius Ports Authority provides five primary port services: bunkering, container transhipment, cruise passenger terminal, port services (emergency services, police, piloting, etc.) and a seafood hub.[32] Currently, the port operates two passenger cruise terminals: the Christian Decotter Terminal in Les Salines, adjacent to Port Louis on the harbour and a smaller Aurelie Perrine terminal for inter-island cruise voyages. Additionally, the port operates an oil jetty, handling approximately 1.5 million metric tons of petroleum products annually. These include refined

▸ Image: Port facilities in Port Louis (credit: Hansueli Krapf)

oil, fuel oil and liquefied petroleum gas (LPG) and molasses.[33] The region's largest LPG storage farm is at Port Louis. The facility is used for distribution to the Indian Ocean Islands and East Africa.[34]

To ensure the port remains regionally competitive with the infrastructure to handle increasingly large vessels, the Port Authority has recently upgraded port facilities and dredged the harbour to extended its depth to over 16 meters, allowing the port to accommodate large ships. In recent years, Port Louis has seen a decrease in the total number of container vessels, but more larger vessels calling at the port.[35]

A further number of large capital projects are planned to grow port capacity related to three blue industries– fishing, trade and tourism:

- Fort William Fishing Port – The Port Authority proposes a new fishing port at Fort William along the harbour's western edge. The new facility will include facilities for ocean-going fishing vessels and equipment, and will entail dredging to accommodate new vessels.
- Island Terminal – A new terminal will be constructed opposite the existing Mauritius Container Terminal (MCT). It will include three dedicated container berths and additional container handling equipment.[36]
- Mauritius Container Terminal extension – A terminal extension is currently underway, involving extension of the terminal inland to accommodate new facilities, mostly within port-owned land.[37]
- Cruise Terminal building – A new cruise terminal and additional support facilities will be constructed to "handle the inter-island passenger traffic and crew from vessels calling at Port Louis."38 The new project will have a footprint of 7500 m2, parking space for vehicles together with a new passenger bridge.

While the Port Authority s fully self-financing for most capital and operational expenses, it requires approval for large capital projects from the national government. The Authority has sought external funding for at least one large proposed capital project and it recently applied to the Green Climate Fund to finance a large breakwater that will protect the harbour and would benefit all landowners and businesses in the harbour, but requires an anticipated investment of $835 million.[39]

Although Mauritius Ports Authority has taken measures to mitigate the likelihood of spills, port activities pose a significant environmental threat. While the ship MV Wakashio, grounded southeast of Mauritius in 2020 was not scheduled to dock at the port of Port Louis, the incident was still an unpleasant reminder of the environmental risks associated with maritime transport. Over 1.5 million metric tons of petroleum are handled in Port Louis each year and even remote potential for spills could be catastrophic to the environmental health of the city and to communities situated along the coast. Additionally, the port lies immediately adjacent to the Rivulet Terre Rouge Estuary Bird Sanctuary, a protected Ramsar site. The Port Authority has supported efforts to protect the sanctuary, though urbanisation along the sanctuary edge also threatens the site along its eastern edge.

TOURISM

Tourist spending in Port Louis is limited by both the number of tourists that visit the city and the amount of time visitors spend in the city. Whilst Mauritius is a prime tourist destination and the tourism industry accounts for roughly 7% of total GDP and 10% of total employment, this industry is focussed around beaches and water recreation outside of Port Louis.[40] A number of small public beaches in Tombeau Bay, Pointe aux Sables and les Salines serve a local population, but no large beach resorts are located within Port Louis or its immediate surroundings. Instead, tourists visiting Port Louis fall into one of three broad categories: cruise passengers disembarking in the city, day-trippers visiting from elsewhere on the island, and business travellers. Spending from these three groups represents a relatively minor proportion of total (national) revenue from tourism. **Tourism in Port Louis is therefore small, but has the potential for reasonable growth if measures are taken to better understand and address the tourist needs.**

Firstly, cruise companies Costa, AIDA and Fred Olsen homeport in Port Louis, with more than ten other companies making transit calls in Port Louis.41 In total, forty-five ships and approximately 124,000 passengers called in Port Louis in 2018.42 Passengers disembark at the Christian Decotter Cruise Terminal, located within walking distance of central Port Louis. A second smaller inter-island terminal is located on the opposite side of the harbour and **a planned third terminal, located adjacent to the Decotter Terminal, will accommodate additional cruise passengers.**[43]

Secondly, tourists staying outside the city may visit Port Louis during day trips. Most tourists to Mauritius visit on holiday (79%), staying an average of ten days. A majority of tourists come as part of a package tour and almost half (45%) have all-inclusive or full-board meal arrangements.[44] Package tourism is an increasingly popular option for tourists visiting the island and **day trips to Port Louis may be offered as a day-trip excursion for visitors staying in resorts or beach hotels on Mauritius' popular northern or western coasts**. For many tourists, one afternoon may be spent in Port Louis.

A third, smaller, tourist group includes business travellers, which account for around 3% of total visitors to the island. Most of Mauritius' large company headquarters, including tourism-based companies, are situated within Port Louis or nearby. For instance, Air Mauritius, which employs nearly 4,000 employees and has an annual turnover of approximately €500 million, is headquartered in Port Louis.[45]

For all three groups, Port Louis offers limited recreational options, which reduces the time that tourists typically spend in the capital. Tourists that do visit Port Louis typically visit well-known sites such as the Central Market or Aapravasi Ghat, a UNESCO World Heritage site, before returning to hotels or resorts outside the city. Tourists staying outside the city are incentivised to maximise time spent in all-inclusive resorts and the city offers relatively few amenities. The limited number of hotels in Port Louis are mostly high-end, with relatively few options available for budget or mid-range tourists. Similarly, few bars or restaurants are open late and streets outside the waterfront area are poorly lit, all of which discourages pedestrian activity after dark. Most businesses in the city are closed on Sundays, with the exception of large supermarkets, market vendors, and bars and restaurants located in the Caudan Waterfront development.

As with other blue industries, employment numbers around tourism are not disaggregated to the municipal level, making it difficult to estimate income and employment from tourism in Port Louis. However, based on interviews, combined with literature on tourism at the national level, tourism is most likely a relatively minor revenue contributor to the city (government revenue from tourism is channelled to the central government and redistributed to the municipal government of Port Louis). Similarly, the industry has relatively minor environmental impacts on the capital.

This report makes a distinction between tourism and real estate development along the waterfront. In the case of Port Louis, the two industries are closely linked, as waterfront real estate developments—which include shopping, restaurants and other leisure activities—cater to both city residents and tourists. **Challenges and opportunities to grow the tourism sector in Port Louis are therefore tied directly to waterfront development.**

▸ Image: Tourism in Port Louis is concentrated along the waterfront. Important tourist attractions include the Le Caudan Waterfront development and Aapravasi Ghat, a UNESCO World Heritage Site.

FISHING AND AQUACULTURE

Commercial fishing in Mauritius consists of large-scale fishing, artisanal fishing and aquaculture (an estimated 20,000 unregistered amateur fishermen also fish inside the lagoon).[46] Large-scale industrial and semi-industrial fishing catches (long-liners, purse seiners and trawlers operating outside the lagoon) are processed and exported from Port Louis, via the Trou Fanfaron Fishing Port. Artisanal fishing and aquaculture mostly take place outside Port Louis: Artisanal-caught fish, mostly within the reef are sold locally on the island, and the country's major aquaculture processing facility is located along Mauritius' southern coast and is not processed or shipped through Port Louis (some freshwater aquaculture occurs inland). In fact, while aquaculture accounted for only 13.4% of Mauritius' total fish supplies in 1990, it has grown at an annual rate of over 6% between 2000 and 2012 but currently represents only around 7 percent of the island's total fish reserves.[47] In total, fishing contributes roughly 1.5% of total GDP and approximately 12,000 Mauritians are employed in the sector.[48] The fishing sector accounts for approximately 18% of total Mauritian exports, with the United Kingdom (22%), Spain (18%) and Italy (12%) as its largest importers.[49,50]

ARTISANAL FISHING

Whilst roughly 30 artisanal fisherman cooperatives (1,660 registered artisanal fishermen) operate on the island, artisanal fishing has been declining in recent years, in part due to overfishing within the lagoon. **A small number of the island's 61 landing points lie within the Port Louis area, but most are located elsewhere on the island.**[51] **Unlike deep water fishing, artisanal catches are typically sold to domestic markets, in supermarkets or markets, or directly to hotels.** In total, coastal or artisanal fishing represents less than 1% of total fish captured, by weight.[52] This number may however be underrepresented, as artisanal catches may not be fully reported.

MEDIUM AND LARGE-SCALE FISHING

Capture fishing (i.e. fish caught in the lagoon or open ocean, rather than farmed) is responsible for the over 90% of total fish production in Mauritius and **150,000 tonnes of fish are handled in the port of Port Louis each year.**[53] Tuna is the island's largest fish export, accounting for nearly two-thirds of the sector's total exports in 2014. In 2017, exports (including re-exports) of fish and fishery products were valued at USD 434 million.[54] **On the whole, however, Mauritian exports of fish products have declined since 2003, possibly due to overfishing of tuna.**[55]

Given the industry's overwhelming reliance on tuna exports, sustainable management of offshore fisheries represents a critical ongoing challenge to Port Louis' fishing sector. Specifically, **reductions in total fish catch due to overfishing and/or climate change pose a significant threat to fishing and fish processing industries based in the capital.**

Port Louis' primary role in the fisheries value chain is as a processor and exporter of fish, rather than in fish capture. Over 1,000 vessels—mostly longliners or purse seiners—are registered in the Port Louis harbour, but only a minority of these are Mauritian-owned and operated.[56,57] Most shipping vessels berthing in the port originate from Asia, with a smaller number of vessels coming from Europe. In 2014, of 783 vessels visiting the port, tuna longliners from Taiwan (277 vessels), Indonesia (37) and China (28) made up over 40% of total vessels.[58]

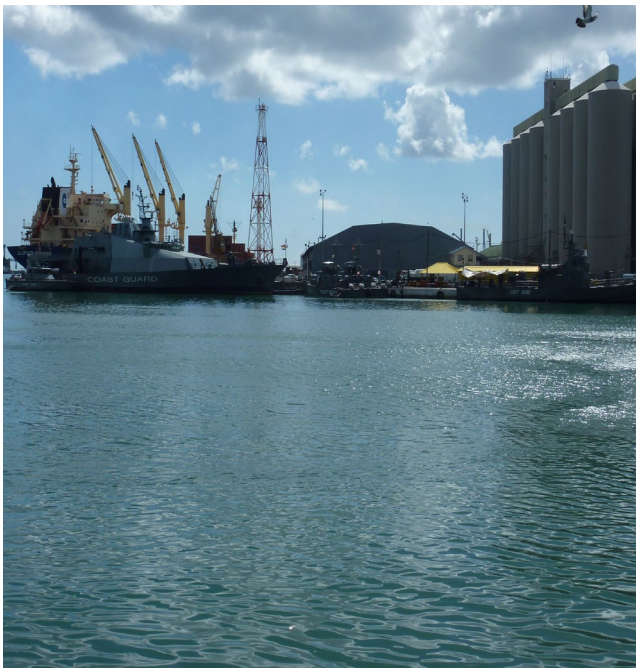
The port's fish handling and processing facilities are well-known in the Western Indian Ocean region. Two of Mauritius' four operational fishing quays are operated by the Ports Authority in Port Louis harbour, and almost all industrial fish processing occurs in the Port Louis area. Fish caught by 'longliner' vessels are either transported to the Agricultural Marketing Board (AMB), cold store in the port; or to cooperatives; or processed -- unloaded, sorted and placed in cold storage--in one of two facilities, the Mauritius Freeport Development Company Ltd and Froid Des Mascareignes (both of which are located in the port area).[59]

The city's processing capacity and ability to meet European standards is a key economic differentiator and an opportunity for future growth, if equipment and skills can keep pace with international best practice. The industry employs residents in and around Port Louis, including not only fisherman, but also an even larger number of workers involved in fish processing, and support businesses specialising in repair and supply of fishing vessels and equipment.[60] **Whereas a significant gender employment gap exists for the whole of the Mauritian economy and this is true of fishing as well, fish processing employs**

almost 1.6 times as many women as men, making it an especially important sector for addressing economic gender imbalance. Nearly 5,000 people are employed in the processing sector, a significant majority of whom work in and around Port Louis.[61] Gender pay gaps may present a challenge, though gender pay data are not available for fishing or fish processing.

To ensure its regional competitiveness, Mauritius Ports Authority has proposed several large-scale investments in its fishing facilities. The 2017 Port Master Plan proposes a new Bain des Dames Fishing port in Fort William, which would house facilities for processing and storage of seafood, as well as mooring for approximately 120 fishing boats.[62] Realising this project, would enhance the importance of Port Louis to industrial fish processing activities in Mauritius.

Growth in the fishing sector may impact on tourism elsewhere on the island. As large trawlers have decreased the abundance of pelagic fish and tuna, the traditional catch for artisanal fishermen, many local fishermen now catch on reef fish. **Because overfishing of reef fish negatively impacts the health of coral reefs, the growth of off-shore fishing (which Port Louis' processing industry relies on) may have unintended impacts on the island's tourism sector if not properly managed.[63]**



▸ Image: Port Louis Harbour (C) Guy Bembridge Flickr

AQUACULTURE

The Mauritius Economic Development Board (EDB) identifies aquaculture as a priority area and seeks to increase the size of aquaculture as a proportion of total fish production.

National growth in the aquaculture industry would likely only have limited impact on Port Louis. Currently, there is one large industrial aquaculture operation on the island—Mahebourg Marine Farm (FMM)—with a production capacity of 850 metric tons.[64] (A second producer, Growfish, is currently expanding operations).[65] FMM products are processed outside of Port Louis and air-freighted from the Sir Seewoosagur Ramgoolam International Airport, bypassing Port Louis and its processing facilities. **Plans to develop the island's aquaculture industry describe a mix of high-end aquaculture products, which would be processed near the aquaculture facility and shipped by air and volume-based products that could be processed in the Port Louis processing facilities and shipped through the seaport.** According to the EDB, new aquaculture facilities would be located outside the lagoon. However, finding appropriate locations for new facilities has proven challenging due to site constraints: most sites around the island are too deep, conflict with existing tourist uses or natural reserve areas, or are subject to overly strong natural currents especially during cyclones.

Some tension exists between the aquaculture industry, and tourism and conservation groups over how to best use limited space within the lagoon, with aquaculture facilities and leisure activities competing for limited space. Separately, the tourism industry and aquaculture have clashed over the assertion that aquaculture attracts sharks and may therefore discourage tourism on the island. Studies from Mauritius and elsewhere show no links between fish farming and increased shark activity and no shark attacks have occurred in the lagoon since FMM began operations.

The potential for conflicts between aquaculture and tourism point to an increasing need for marine spatial planning (MSP) to address issues of 'overcrowding' within the lagoon. In fact, the Government of Mauritius through its Department for Continental Shelf, Maritime Zones Administration & Exploration is developing a Marine Spatial Plan in order to better manage the maritime zone of Mauritius and avoid conflicts in use.

WATERFRONT DEVELOPMENT

▸ Image: Le Caudan Waterfront, Port Louis, © Shutterstock

Recent development in Port Louis has concentrated around the waterfront, which includes a mix of port facilities related to fishing and shipping, historic sites (including museums and a UNESCO world heritage site), business facilities and conference venues, and touristic/recreational amenities including restaurants, hotels and cultural activities (cinema, arts centre). **A combination of high-end hospitality and retail outlets along the waterfront generates employment and revenue for the city which supplements primary port-related economic activity. Still, the waterfront development remains fragmented and to date, investment has concentrated around the Le Caudan development, with comparatively little investment in cultural sites north of Le Caudan.**

Waterfront land is owned by two public agencies: (i) the Ministry of Housing and Land Use Planning and the parastatal Mauritius Ports Authority, which lease land to private users, including several large private companies namely Caudan Development Limited, United Docks and Le Suffren Hotel and Spa and (ii) Landscope Mauritius, a public company whose main shareholder is the Government of Mauritius.

The waterfront area is recognised as a potential driver of economic growth in the city and a number of ongoing projects are set to expand commercial development and access to the waterfront. Details of ongoing or completed waterfront developments are as follows:

- **The Ports Authority is one of two large property owners along the waterfront and has proposed a series of developments**. In addition to already well-established operations along the eastern edge of the harbour, the Authority also owns land in Les Salines, adjacent to Le Caudan Waterfront. According to the 2017 Ports Authority Masterplan, this land will be

developed as an expansion of the Caudan recreation area with tourist attractions that include an aquarium and water park. Additional proposed land uses in Les Salines include light industry and logistics centre and support facilities for the cruise terminal. Other land under Port Authority control will support the expansion of the existing passenger cruise terminal.

- **Le Caudan Waterfront is the first and largest development of its kind in Mauritius and the main driver of recreational activity along the waterfront in Port Louis.** The development includes restaurants, bars, retail shopping, museums, arts facilities, a hotels and conference venue and is a popular destination for tourists disembarking or embarking from the nearby Christian Decotter Terminal. Le Caudan Waterfront is managed by Promotion and Development, an associate of the Mauritius Commercial Bank.[66]
- Le Suffren Hotel and Marina, is a four-star hotel that sits across the harbour from Le Caudan, on backfilled land owned by the Ministry of Housing and Land Use Planning.
- **Landscope, a public company, manages 21 sites around the island, including land between the fishing port at Trou Fanfaron, and at Caudan, immediately north of the M2 highway. As of March 2019, the Trou Fanfaron-Caudan area has been under significant redevelopment and construction.** The renovation of this space takes place under three development phases, with the first phase complete and the second phase currently underway, consisting of renovation and extension of the Astrolabe Shopping Centre and renovation of one of the two underpasses connecting the city (the South Underpass). Under the project's third phase, renovation of "heritage buildings (the Granary, ex-Military Hospital and Parcel Post) found within the buffer zone of the Aapravasi Ghat World Heritage Property will be rehabilitated to accommodate museums, art galleries, boutique hotel, restaurants and tourist-related facilities and services."[67] **Development within the Aapravasi Ghat World Heritage Site and Buffer Zone, which includes Port Louis fish and meat markets** across the M1, requires approval from UNESCO's World Heritage Centre.
- In 2019, a light rail terminal opened in Le Caudan, connecting Port Louis to Rose Hill through the Metro Express rail line, and improving access to Le Caudan, Astrolabe Shopping Centre and downtown Port Louis. The metro line is being extended and by 2022, it will extend to Quatre Bornes and Curepipe in the centre of the island. New transit options will improve access to the waterfront and the capital in general.
- **United Docks is a private developer and the single largest landowner in Port Louis. United Docks operates a business park and a park-and-ride system on a site of approximately 44,000 m², ** situated adjacent to Le Suffren Hotel and Le Caudan Waterfront development.[68]
- **The Victoria Bus station is currently undergoing renovation south of the M2 highway. When completed, the new station and adjacent Guy Rozemont Square mall, will connect the central business district to the waterfront through Le Caudan by an overpass**. It will also introduce new office and commercial space to downtown Port Louis, in addition to hawker stands, greenspace and parking.[69] The project was announced in 2016 and is scheduled to be completed in 2021.

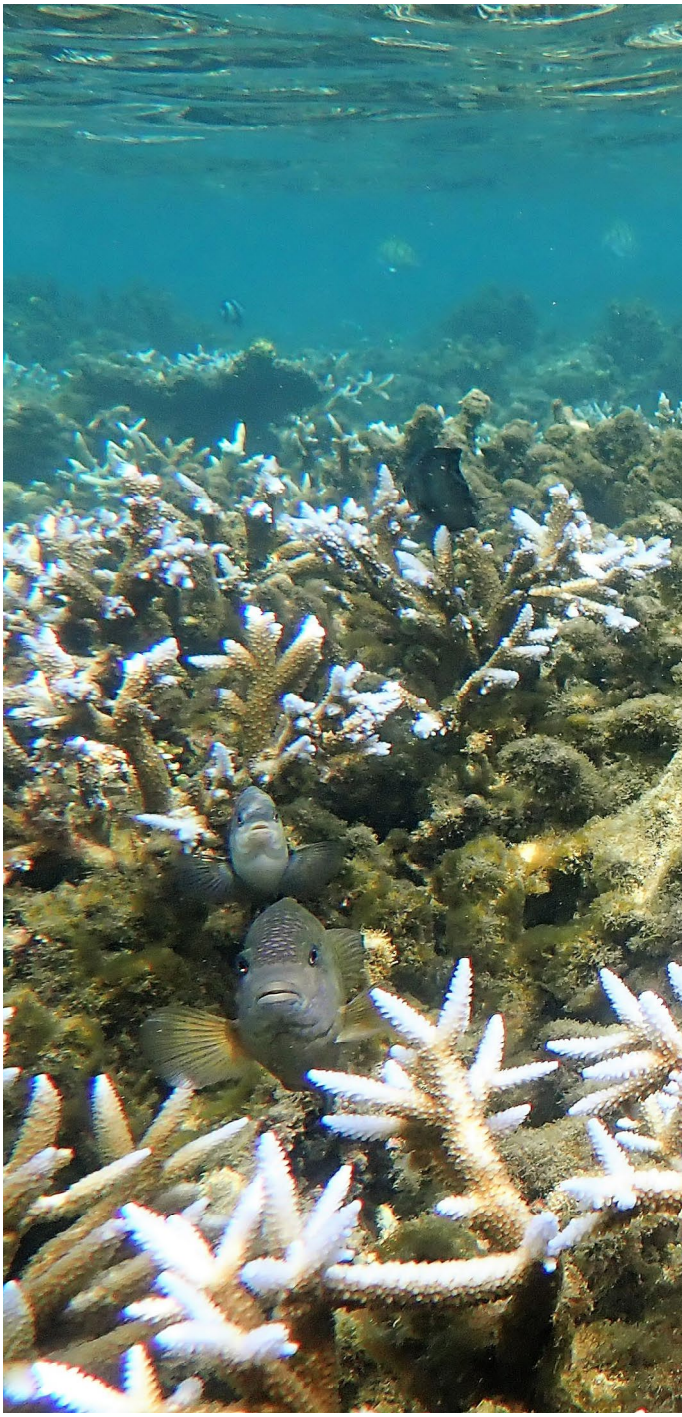
Whilst the potential of the waterfront as a commercial hub is well-established, Port Louis' significant cultural and historical assets are less developed. Historical sites like the Aapravasi Ghat World Heritage Site and Postal Museum, and important public spaces such as Immigration Square, the Central Post Office, Central Market and the Fish Market are all located in the extended waterfront area. **An opportunity exists to tie these sites together, to link the entire waterfront (from Le Caudan to Aapravasi Ghat) and connect the waterfront with Port Louis' central business district. Investment in the full waterfront area would extend benefits to a wider range of Port Louis residents.**

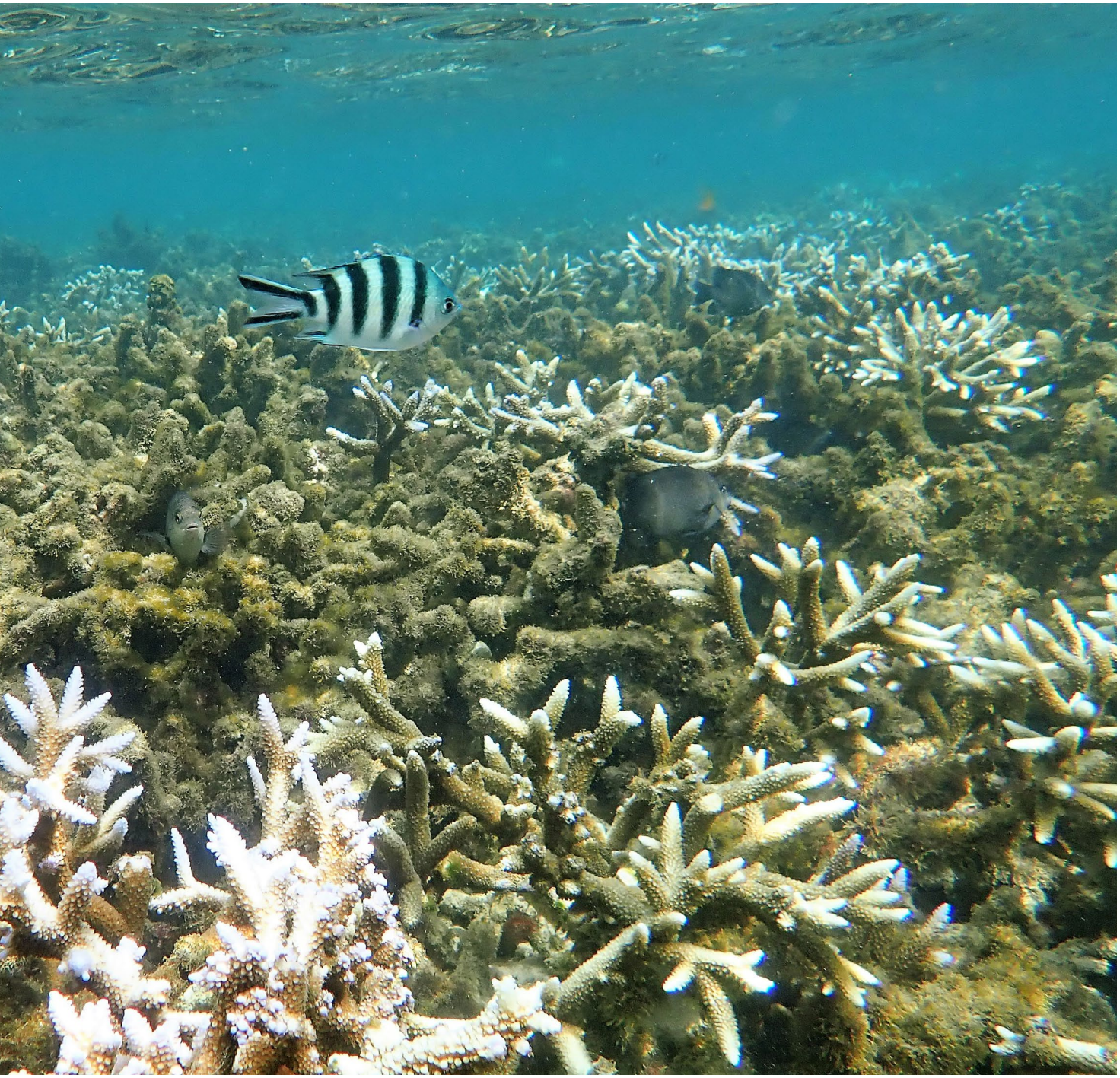
MARINE BIOTECHNOLOGY

The Economic Development Board Mauritius (EBD) has identified marine biotechnology as a priority area for further development. However, efforts to develop this sector remain in the early stages. Specifically, marine bioprospecting—which refers to the exploration of biological material for commercial applications, with applications to pharmaceutical and cosmetic, biotechnology and agro-business industries—is a rich area for research and development for Mauritius. According to Conservation International, the WIO region is the 10th largest biodiversity hotspot in the world and yet has "only contributed 83 of the world's 1,100 leading commercial medicinal plants" as of 2011.[70]

The biotechnology sector relies on cultures of innovation, technical skills (from academic and private sector partnerships) and legal mechanisms that ensure intellectual property. Port Louis has many of these qualities. The capital and its environs are home to the University of Mauritius, Association for African Medicinal Plants Standards (AAMPS), the Mauritius Research Council and various private companies supporting elements of the marine biotech industry supply chain. Since 2016, the Government of Mauritius has signed up to international treaties to protect intellectual property, including the Patent Cooperation Treaty, the Hague Convention, Madrid Protocol and national regulatory frameworks to support research in the fields of biotechnology.[71]

Despite these advances, biotechnology remains an underdeveloped sector of the economy. As with other blue industries, financing for marine biotechnology remains a critical challenge. The private sector for marine biotechnology in Mauritius is not yet developed and the Government of Mauritius is unlikely to assume the full risk associated with these industries, for which demand is relatively unproven. Because Mauritius is a high-income country[72] with consistent economic growth, it is often ineligible for development loans that target LDCs. **The question of how to finance marine biotechnology is relevant and timely.**





▸ Image Marine Fish and Corals (C) University of Mauritius

2.3. OPERATIONAL ENVIRONMENT FOR THE BLUE ECONOMY

Unlike most WIO cities which have experienced rapid growth in recent decades, the population of Port Louis has remained relatively stable. In fact, between 2000 and 2011, the city declined in population by roughly one-half percent. Nevertheless, the city still experiences some infrastructure challenges which impact ocean health and threaten the sustainability of blue economy sectors. However, in many areas Port Louis is still performing better than most major WIO cities. This section discusses the current status of some select urban systems in Port Louis.

WASTEWATER MANAGEMENT

Port Louis benefitted from significant sewage system upgrades over the past half a century, improving treatment for the city. The Port Louis System which caters to the local inhabitants and day business visitors consists of some 430 km of pipeline network over a service area of 36 km^2, serving about 47,650 subscribers. It has a daily output of 100,000 m3 and includes 16 treated water service reservoirs.

Water distribution systems for domestic purposes in Port Louis date back to 1790 with the construction of the Dayot Canal to convey untreated water from Grand River North West, to the western suburbs of Port Louis. In the early 19th century, the Bathurst Canal was built to divert untreated water from Calebasses River at Terre Rouge, to the eastern suburbs of Port Louis.[73] Subsequently, with population growth, piped systems were introduced. Asbestos cement pipelines (laid during the period 1860 to 1880 from Pailles Dam to supply Port Louis) were still in service until recently. The first sewer pipes were laid in Port Louis in the late 19th century. However, the system did not provide for the treatment of wastewater, and all effluents were discharged into the sea.[74]

The present Plaines Wilhems system was developed in the 1960s and major improvements were brought to the Port Louis system in the late sixties and early seventies.[75] Presently, Port Louis is served by two sewage treatment plants: The Baie du Tombeau Sewerage network covers the northern Port Louis and the Montagne Jacquot Sewerage system consists in transportation, treatment and disposal of 48,000 m^3 per day of wastewater from the areas of Southern Port Louis and its vicinity, namely lower Beau Bassin and Coromandel, including the industrial areas of Plaine Lauzun, Coromandel, La Tour Koenig and Pailles.[76]

While sewage treatment infrastructure appears relatively well-developed, Port Louis has still experienced liquid pollution challenges in recent years. In 2016, scientists began to assess the origin of nitrate pollution after authorities detected nitrate contamination around Port Louis. As well as threatening protected areas, such as the Rivulet Terre Rouge Estuary Bird Sanctuary, contaminants were causing toxic algal blooms in the ocean waters and caused episodes of fish kill, resulting in complaints from local fishermen. **Preliminary findings have suggested that agricultural activities, faulty septic tanks, inappropriate household practices and industrial discharges could all be potential contributors to this pollution.[77]**

f There are six distribution systems in Mauritius and The Port Louis system, (which covers the capital Port Louis and the suburbs of Pointe aux Sables, Petite Rivière, Pailles and Vallée des Prêtres) is one of the major systems

SOLID WASTE MANAGEMENT

Though solid waste collection rates for Port Louis are close to 100%, waste treatment still poses a challenge for Mauritius. Collected waste is brought to transfer stations, and from those it is brought to the Mare Chicose landfill[78] approximately 20 miles southeast of Port Louis. Working groups hosted by the Ministry of the Environment, Solid Waste Management and Climate Change are currently reviewing options to add capacity to the existing landfill site, but primary focus remains on recycling and waste segregation to minimise waste generation rates.[79] **Island-wide efforts towards waste segregation and increased recycling are being undertaken by the Ministry of Environment to reduce the waste stream and expand capacity of the existing Mare Chicose landfill.**

The waste profile for Port Louis follows the same general trend for other cities, with organic waste being the major component of collected garbage. Port Louis and its suburbs generates an average of 6,308 tonnes of solid waste monthly, with 64% being of organic origin, 13% paper and 12.4% plastic waste. However, **only 7% of the collected waste are used for recycling and composting. Furthermore, as at 2014, a composting facility implemented at La Chaumiere was operating at only 61% of its capacity. There is, thus, significant potential to extend this figure to a much higher percentage.**

A study entitled "The Zero-Waste City: Case Study of Port Louis, Mauritius"[80] investigated key indicators in sustainable waste management from a socio-economic, political/ institutional and technological standpoint that might affect the potential application of a zero-waste concept in the city of Port Louis. The study noted that, although several ongoing good practices had been noticed in terms of policies for coping with solid municipal waste, there was still room for further improvement. These **improvements could be in the form of a complete paradigm shift in connection with consumption patterns and further responsibilities on stakeholders, manufactures and suppliers of goods for the city of Port Louis.** Such a shift needs to be combined with enhanced and more rigorous legislation pertaining directly to the zero-waste concept and an introduction of state-of-the-art technologies for better 'cradle to cradle' management of municipal solid waste.

Waste management relates directly to all of Port Louis' principle blue industries. Waste, particularly plastic bottles and bags, flows into the harbour and can damage fishing and cargo vessels. Solid waste is unsightly for tourists and may end up on popular beaches along the western Mauritian coast. Additionally, rivers, streams (Le Pouce Stream, La Paix Stream, Lataniers River, Terre Rouge River, etc) and colonial era canals run through or near downtown Port Louis. During periods of heavy rainfall, these watercourses carry waste from upstream communities to the Port Louis harbour. Heavy rains caused flooding in 2016 and 2013, when eleven people died. **Better coordination between upstream and downstream communities is needed to reduce waste flows into the harbour.**

▸ Image: Le Paix stream, a canalised watercourse running through downtown Port Louis

EDUCATION AND EMPLOYMENT

While Mauritius' structural reform has resulted in an increasing GDP, putting the country into the high-income group according to the World Bank, inequality has risen over the past two decades.[81] According to the World Bank, "between 2001 and 2015, the gap between the incomes of the poorest and the richest 10 percent of households increased by 37 percent" in part due to structural changes in the economy away from low-skill sectors such as agriculture and manufacturing, and towards professional services, real estate and financial services.[82] However, "a considerable increase in the demand for skilled workers, was not matched by an equally rapid increase in the supply of skilled workers."

Despite general growth, nearly 10% of the country's population lives below the poverty line.[83] Mauritius' Gini coefficient, a measure of inequality, is roughly equivalent to the world average but has increased from 35.7 to 36.8 between 2006 and 2017, suggesting that economic growth has also resulted in rising inequality.[84,85]

Unemployment rates for women and youth are significantly higher than the national average standing at 10.1% and 22.1%, respectively, compared with 6.9% for the island, in 2018. In part, high unemployment results from a skills deficit, with job applicants lacking necessary skills to work in the services sector.[86] Youth may be particularly impacted by this education mismatch and youth unemployment is above 25%.[87] Women participate at lower rates in the labour force and are paid less than men on average, though this situation is improving.[88,89] The African Development Bank expects the economy to "diversify further into higher value-added sectors such as agro-processing, medical tourism, higher education services and development of the ocean economy." This may support further growth, but also creates a risk of further inequality and segregation in the labour force.[90]

More broadly, as the economy moves towards larger companies and more centralised blue economy activity in the sectors discussed in section 2.2, care should be taken to protect small and medium-sized businesses. Such businesses include artisanal fishers, small-scale tour operators and smaller-sized service businesses (restaurants, hotels, etc.) that cater to visitors and Mauritians at the Port Louis waterfront and surrounding area.

CLIMATE CHANGE ADAPTATION AND RESILIENCE

According to the United Nations World Risk Report 2016, Mauritius is the 13th most at-risk country in the world (and the 7th most exposed to natural disasters).[91] In fact, it would be difficult to overstate the potential threat of climate change to the city. According to the Mauritius Meteorological Services, "the rate of sea level rise (measured in Port Louis) has averaged 3.8 mm/year over the last five years... [compared] to an average of 2.1 mm/year over the last 22 years."[92]

Port Louis lies at mean sea level and many of the city's most valuable properties (historic sites, office buildings, markets, shipping, fishing and tourism assets) lie on or near the shoreline. Mauritius sits within the cyclone area of the Indian Ocean and cyclones have caused significant loss of property and life. According to the World Bank, "each year, there is a 1 percent chance of losses exceeding USD$1.9 billion or 16 percent of Mauritius' GDP."[93] As discussed in Chapter 1, flash flooding is also a growing problem.

Indirect impacts of climate change on the city economy include diminished fish returns due to disruptions in the fish-reproduction cycle. Additionally, harm to the island's tourism industry would reduce tourist spending in the capital. Thus, destruction of coral reefs due to bleaching and the effect of temperature rise on coral spawning, rise of invasive species such as jellyfish and beach erosion (due in part to destruction of coral, with its wave attenuating properties) all pose indirect threats to Port Louis. In the Port Louis area, erosion has been documented in the Pointe aux Sables and Tombeau Bay areas. Around the island, coastal erosion poses a continuous challenge: **Mauritius has lost 11% of its coastline since the 1960s to erosion.[94] Some beaches shrank by more than 10 metres over the last decade.[95,96]**

▸ Image Mauritius Coastline

2.4. SUMMARY OF INTERDEPENDENCIES

ISSUE	CAUSE/DRIVER	POTENTIAL BE IMPACT	POTENTIAL WIDER IMPACT
Solid waste discharged into Port Louis harbour through watercourses	Limited coordination between upstream and downstream users/ communities around waste management and collection	Tourism and waterfront development – unattractive waterfront landscapes Tourism – if dive sites affected or visible pollution	Further limits revenue from tourism as visitors (including cruise passengers) choose to spend less time in the capital; hurts property value for commercial and hospitality businesses; potential reduction of vessel traffic through the port would harm employment and revenue for the MPA
		Port – solid waste can harm ship equipment and necessitate costly repairs	
Fragmented urban waterfront landscape	Multiple owners along waterfront; limited public investment in streetscape improvements; highways cut off waterfront from the central business district	Tourism – reduced tourist activity in Port Louis	Unrealised potential for growth of key blue industries; reduced activity from residents during evenings, weekends reduce retail activity in commercial core
		Waterfront development – unrealised potential for economic growth	
Overfishing of tuna and other major fish export products	High demand for tuna from Europe and elsewhere makes Port Louis extremely reliant on tuna for fish exports	Continued overfishing will limit capacity of fish processing	Ecological impact on marine ecosystems; Reduced employment for fish processing industry; Reduced revenue for city and national government.
Limited tourism offerings in Port Louis	Tourism infrastructure concentrates elsewhere in the island; tour groups provide packages that discourage extended visits to the capital	Missed opportunity for expanded tourism in Port Louis; employment and revenue 'left on the table'.	Economic and livelihood disruption, increase in social ills, need for new diverse employment opportunities
Limited tourism offerings in Port Louis	Climate change impacts from global carbon emissions	Tourism – destruction of local habitats, beach erosion	Economic and livelihood disruption, increase in social ills, need for new diverse employment opportunities

ISSUE	CAUSE/DRIVER	POTENTIAL BE IMPACT	POTENTIAL WIDER IMPACT
Climate change	Climate change impacts from global carbon emissions	Tourism – destruction of local habitats, beach erosion	Island-wide disruption to economy resulting in reduced employment and loss of revenue
		Port – increased risk from sea level rise and storm surge to waterfront assets	
		Waterfront development – increased risk from sea level rise and storm surge to waterfront assets	
		Fishing – diminished catches as habitats change and fish migration and reproduction patterns shift	
New sources of finances are needed for emerging blue industries	As a middle-income country with a small economy, Mauritius is not able to finance emerging blue industries such as marine bio-tech yet is ineligible for loans targeting low income countries	Port – additional financing is needed to support large capital projects for climate change adaptation	New opportunities for economic growth in Port Louis are unrealised
		Marine biotech – financing needed for research and development, market assessment, etc.	

This table presents some of the inter-related issues within the blue economy of Port louis, illustrating how challenges in one sector can impact other blue economy sectors, as well as how the shortcomings within some of the wider urban systems, are directly impacting specific blue economy sectors. Whilst this table primarily focuses on challenges, it is also important to highlight that improvements in one sector can bring positive effects to other sectors of the blue economy.

CHAPTER 3

PORT LOUIS BLUE ECONOMY RECOMMENDATIONS

Specific strategic and operational recommendations which respond to issues identified in the preceding chapters are detailed hereafter. These recommendations are not intended to be exhaustive, but provide suggestions and possible directions for the blue economy in Port Louis. Recommendations are provided for both specific blue economy sectors and the wider operational urban environment.

▸ Image: Port Louis waterfront

3.1. SECTOR-SPECIFIC RECOMMENDATIONS

MARITIME TRADE AND PORT

Wider government can continue to work with the Mauritius Ports Authority to realise and fully capitalise on necessary improvements to the port and to ensure that steps are taken to minimise the impacts of the port on the natural environment.

- National ministries can work with the MPA to ensure that the potential effects of large-scale spills are well-understood and adequate emergency measures are in place to mitigate the impact of catastrophic events which could damage the harbour and coastal communities south of Port Louis.
- Multi-stakeholder partnerships can be undertaken in collaboration with the MPA to support capital intensive infrastructure upgrades that protect the port, such as breakwaters. These projects protect port infrastructure which is vital to the national economy and protect private development along the waterfront.
- Ensure that projects in place to grow and develop port capacity are supported by robust ESIA process, and that training opportunities at Mauritius Maritime Training Academy and other institutions are aligned to effectively respond to potential employment opportunities that such developments can create for local communities including urban youth.

▸ Image: Port of Port Louis (C) Harry and Rowena Kennedy Flickr

TOURISM

Government support to small and medium-sized businesses operating in Port Louis, alongside comprehensive planning and marketing that ties together Port Louis' touristic offerings, could create new tourism opportunities in the capital.

- Government can explore a range of policies—including training and support services, loans, tax incentives, market research and advertising services—to support small and medium-sized businesses located in Port Louis, with a goal of expanding the city's tourist offerings and diversifying the tourist activities available on the island. For example, government-sponsored advertising campaigns could promote Port Louis' diverse architectural, historical and culinary offerings and offer an 'authentic' experience to tourists interested in learning about the island's culture.
- The Ministry of Tourism's Tourism Employee Welfare Fund (TEWF) provides education and training loans, grants and gifts for employees working in the tourism industry and their families.[97] Programmes run through the TEWF can target economically disadvantaged populations including women and youth to improve workforce participation and pay equity.
- A Port Louis Integrated Master Plan could link neighbouring sites into a consolidated tourist 'circuit' that brings visitors along the full length of the waterfront and from the harbour into downtown Port Louis, its central business district and Chinatown.
- Existing tourist sites along the waterfront could be targeted for additional investment or upgrades. The Ministry of Tourism (working with the Ministry of Arts and Culture and National Museum Council) has implemented a 'historic trail' for walking tours in Port Louis and undertaken renovation and upgrades of selected historic sites. Still, more can be done to promote pedestrian tourism experiences, alongside investment in important sites, potentially through partnerships with local business or private tour operators, and/or through advertising campaigns which promote the city as a key tourist attraction.
- Throughout the island, large-scale tour operators are generally well organised and work together with government and NGOs to realise sustainable use of natural resources. However, medium and small scale operators are typically under-resourced and not actively engaged with government and local NGOs on initiatives for sustainable tourist activities. Though some initiatives provided by the Ministry of Tourism do target medium and small-scale operators, additional support is still required.

▸ Image: Port Louis Waterfront (C) Harry and Rowena Kennedy Flickr

FISHING

Support to the fishing industry would likely focus on industrial and semi-industrial operators using the port. Although artisanal fisheries have little direct impact on Port Louis, which is primarily a processing facility for larger-scale operations, support for coastal fisheries would improve the health of the lagoon ecosystem, which would be a boon to tourism on the island and generate spill-over benefits to Port Louis. Improved coordination between the tourism and fishing/ aquaculture industries is necessary to ensure best uses of limited coastal spaces.

- Continued investment in existing fish processing facilities would be beneficial, to ensure that these facilities keep up with global standards and the demands of large importers.
- Overfishing is a key issue and there may be a need for continuing and expanded studies to better understand the full range of off-shore fish resources, and to better identify areas of overfishing, with the objective of increasingly sustainable fishing near Port Louis and further afield.
- Facilitate communication between the tourism industry and aquaculture industry to balance competing uses within the lagoon and outside, tied to wider marine spatial planning efforts. Such efforts may need to resolve existing conflicts and address misconceptions such as the suggested relationship between aquaculture and shark attacks.
- Limits, quotas, extended seasonal bans or full prohibition of fishing in the lagoon can encourage replenishment of fish stocks. These interventions would improve the ecological health of the lagoon, with associated benefits to tourism from improved coral and biodiversity.
- Government initiatives to promote participation of youth and women in the fishing industry would be beneficial. This includes promoting employment in fish capture, aquaculture and processing, through targeted training/education, tax incentives to businesses and wide-ranging policies such as parental leave and childcare, that encourage female participation in the workforce.

▸ Image: Central Market and Fish Market in Port Louis are used by residents and also visited by tourists

WATERFRONT DEVELOPMENT

Improved linkages along the waterfront, and between the Port Louis central business district and its waterfront would exploit significant existing cultural and recreational assets for visitors to the city. Urban planning upgrades in the form of improved streetscapes, lighting and accessibility would benefit Mauritians and tourists alike, improving quality of life in the capital and making Port Louis a more attractive destination for visitors.

- Encourage coordination between blue industries (maritime trade, tourism, waterfront real estate and retail). Government could initiate events, working groups, committees and other mechanisms that build collaboration between stakeholders operating along the waterfront and in the Port Louis central business district. These initiatives can address interdependencies across industries and promote dialogue between large companies and small and medium-sized businesses.
- Improvements to the physical infrastructure and streetscape can increase access and activity along the waterfront. A six-lane highway (M1) separates the Port Louis waterfront from the city's central business district. Currently, there are no ground-level connections to the waterfront, but two underpasses link the waterfront to the rest of the city. New ground-level connections or cross-walks and improved wayfinding could help improve crossing points and guide visitors to two underground passages and the pedestrian overpass. Improved night-lighting should be implemented along major corridors near the waterfront to encourage night-time activity.
- Public investment in the downtown core area (i.e. central business district) to increase pedestrian activity and encourage small shops, as an alternative to malls and other retailers found outside the city. The 2015 'Outline Planning Scheme: Municipal City Council Area of Port Louis', describes a vision for City Centre Regeneration includes pedestrianisation, transit-oriented development (TOD) and "introducing high standards of building design and improvements to the public realm", focusing on pedestrians, cyclists and people with disabilities.[98]
- Refurbishment of historic and educational amenities along the waterfront could reinforce the area as the cultural centre for Port Louis (and the island). The Old Granary building, the Post office and the old hospital can link with the Aapravasi Ghat World Heritage site to form a cultural core for the area. As the Ports Authority Masterplan notes, such a development would "use buildings in a sensitive historical context that are not easy to retain for port use" yet are currently underutilised.[99] As part of its third phase of renovation of the Port Louis Waterfront, 'Landscope' has proposed rejuvenation of several heritage buildings (Granary, ex-Military Hospital, Parcel Post Office). Municipal councils and government should take an active role in providing expertise and resources where appropriate and help to facilitate the alignment of stakeholder interests in this area.
- Further efforts to reduce congestion along the waterfront and M1 road will unlock the potential of the site for new development. Continued investment in public transit may decrease traffic congestion along this corridor. Reduced congestion would improve the appearance of the waterfront area, air quality and access to waterfront amenities.

MARINE BIOTECHNOLOGY

Marine bio-technology has been identified as a priority area in developing the blue economy nationally. Given the concentration of money and universities in and around Port Louis, the city could see benefits from further developing this industry. As a key first step, a scoping study is required to identify existing resources, priorities, timelines and proposals for advancing marine biotechnology. This would involve moving away from the high-level strategy development and developing action plans for the sector. Public sector training on new technologies should be included to ensure the Government of Mauritius has the ability and capacity to regulate new technologies as they are introduced.

▸ Image: Marine corals Mauritius (C) University of Mauritius

3.2. OPERATIONAL ENVIRONMENT

Other recommendations for actions taken at the city and national level relate to public education and capacity-building related to marine resources, and the treatment of solid waste in order to protect the marine environment.

- A Watercourse Task Force could ensure coordination around multiple stakeholder groups in national government (Ministry of the Environment, Solid Waste Management and Climate Change; Ministry of Local Government, Disaster and Risk Management; Ministry of Tourism; Ministry of Agro Industry and Food Security; Ministry of Housing and Land Use Planning, etc.), municipal and local government, large private landowners, community-based organisations and NGOs involved in 'ridge to reef' conservation planning. The task force would be charged with managing the health of heavily polluted watercourses and severely affected coastal areas through multi-stakeholder partnerships that reduce waste impacts through a combination of infrastructure investment, policy enforcement and behaviour change. As part of the task force, the Mauritius Ports Authority, the municipality and upstream communities could work to minimise the impact of solid waste and reduce the quantity of waste that reaches the harbour. The Port Authority has already initiated programmes to clean waste, but most actions do not treat underlying upstream causes.
- Engagement is required with local communities for capacity building around sustainable uses of coastal resources. Mandatory education and training can be included in licensing for fishing and boat operators. Ecology training can be advertised to local businesses that provide tours or guide services to tourists. Education around climate resources is an island-wide initiative that should include outreach to coastal communities in Port Louis and its environs.
- Across the island, investment in efforts to reduce waste generation and encourage waste segregation should be initiated. Additional bans on plastic materials should be considered. Support for private sector recycling and improved management of organic matter (e.g. through community composting or large-scale agricultural composting) should also be considered.
- Free advisory services and training for farmers on best practices with respect to fertilisers, crop management and pollution prevention might be beneficial. Where missing, measures could include:
  - Establishing protection zones along surface watercourses, within farms and in buffer zones around farms;
  - Manure management;
  - Management of intensive livestock operations;
  - The use of feed additives, hormones and medicines should also adhere to national standards and international guidelines.
  - In extensive livestock systems, overgrazing should be avoided to reduce land degradation and erosion.[100]

3.3. MOVING FORWARDS

Strengthening the blue economy in Port Louis will entail a mix of cross-cutting strategies and sector-specific policies that focus on growing local capacity in established areas of tourism, ports maritime trade and fishing, alongside further exploration and investment in new and developing blue economy sectors such as biotechnology and waterfront development. This case study has aimed to provide a starting point for the development of a future city blue economy strategy for Port Louis, that can be developed, coordinated with national plans and objectives. It is the intention that this report will also provide inspiration for cities that share characteristics with Port Louis.

'The Roadmap for WIO Coastal Cities and the Blue Economy' which exists as another report in this research portfolio, describes wider actions for cities across the region. When prioritising recommendations for the Roadmap, those involved in the shortlisting process considered the merits of each recommendation (as a future action for WIO cities) against six criteria:

1. How well does the recommendation support economic development of WIO cities?

2. How well does the recommendation support social development in WIO cities?

3. How well does the recommendation support environmental sustainability of the marine and/or coastal environment?

4 Financial viability – how does the investment required align to existing or potential sources of finance and funding?

5. Technical viability – how does the technical complexity of the recommendation align to existing technical maturity in the sector?

6. Acceptance - Would there be general support across BE stakeholders necessary to realise this action/ ambition?

Recommendations have sought to balance economic, social and environmental concerns and the Roadmap recommendations are typically felt to be of value to cities across the region. However, context is of course key, and we encourage national, city and local blue economy stakeholders to further consider how the actions outlined here, and in the Regional Roadmap, can support the further development of a sustainable blue economy in Port Louis

▸ Image: Port Louis at Sunset (C) Fadil AdobeStock

ANNEX

STAKEHOLDERS CONSULTED (PORT LOUIS)

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