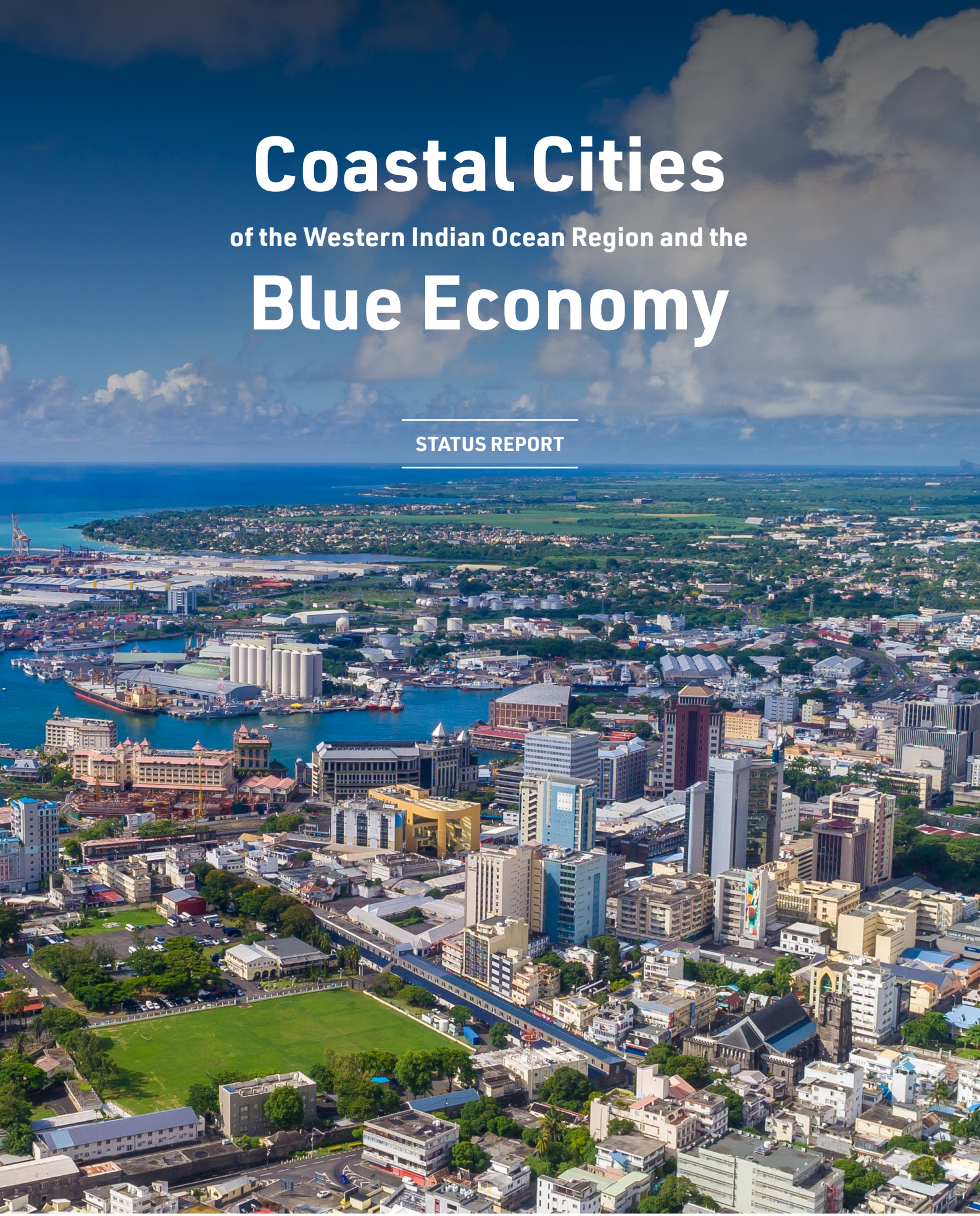
Coastal Cities

of the Western Indian Ocean Region and the

Blue Economy

STATUS REPORT



WIOMSA
Coasts Ocean and People
WESTERN INDIAN OCEAN MARINE SCIENCE ASSOCIATION

UN HABITAT
FOR A BETTER URBAN FUTURE

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▸ Cover Image: Port and wider city, Port Louis, Mauritius © Ryan Chan Yam, Shutterstock

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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.

On our behalf and behalf of UN-Habitat, we wish to thank Arup for drafting these reports with WIOMSA, UN-Habitat and experts from the region, particularly from the four case studies. We are grateful for the dedication, generous and thoughtful contributions by Arup experts that have led to producing these high-quality reports. We indeed are indebted to them for accepting our many demands with such grace and professionalism.

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▸ Image: Indian Ocean, Mombasa

ACRONYMS

AI – Artificial Intelligence

BE – Blue Economy

BMU – Beach Management Unit

CBOs - Community-based organizations

COP – Conference of the Parties

CSO - Civil Society Organization

DRR – Disaster Risk Reduction

EEZ - Exclusive Economic Zones

EIA – Environmental Impact Assessment

ESIA - Environmental Social Impact Assessment

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

JICA - Japan International Cooperation Agency

JKP - Jumuiya ya Kaunti za Pwani (economic bloc of Kenyan coastal counties)

KCTA - Kenya Coast Tourist Association

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

RCP - A Representative Concentration Pathway (a greenhouse gas concentration trajectory)

SA – South Africa

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

TAFIRI - Tanzania Fisheries Research Institute

TVET - Technical & Vocational Education & Training

TEU – Twenty-foot Equivalent Unit

UNECA – United Nations Economic Commission for Africa

UNEP - UN Environment Programme

UNICEF - United Nations Children's Emergency Fund

WIO – Western Indian Ocean

WIOMSA – Western Indian Ocean Marine Science Association

WWF - The World Wildlife Fund

CONTENTS

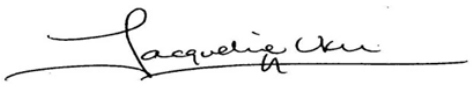
FOREWORD

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, examining challenges and opportunities and offering 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.

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

Arthur Tuda
(Executive Secretary - WIOMSA)

EXECUTIVE SUMMARY

Coastal cities are gateways of trade and transport for countries in the WIO region and sites of key blue economy activity and infrastructure including ports, airports, hotels and fish markets, as well as providing the workforce that supports key blue economy sectors. These sectors do not necessarily exist in harmony and competing demands must be managed. Coastal cities are also sites of significant urban population growth, much of which is unplanned and vulnerable to climate induced hazards including sea-level-rise and coastal flooding. Urban growth challenges do not only concern major coastal cities, one must also consider the cumulative rapid growth of smaller secondary cities much of which is unplanned and lacking corresponding infrastructural development. **All these challenges play out at the city level, and this must be recognised in blue economy policy and operational action.**

The influence of municipal authorities with respect to the blue economy differs considerably across WIO countries, linked to decentralisation and fiscal autonomy. Mainland cities with a more advanced devolution process (e.g. Durban, Mombasa and Dar es Salaam) have significant responsibility and fiscal autonomy. Mozambican cities also have devolved responsibilities but have lower fiscal and administrative capacity. On Comoros and Madagascar, local authorities offer stable government but are undermined by low fiscal capacity, while on Seychelles and Mauritius, city authorities typically have much lower responsibility than their mainland counterparts and a limited role in blue economy planning and implementation. **Nationally driven blue economy projects and FDI play a crucial role across WIO cities.**

Even cities with limited blue economy responsibility are responsible for the provision of key municipal services which can support or undermine blue economy sectors and it is therefore important that all local authorities are engaged in blue economy planning. WIO countries are at varying stages of blue economy strategy development and Marine Spatial Planning (MSP), with Seychelles, Mauritius, South Africa and Kenya having made furthest progress. In Kenya, MSP is being undertaken at both national and local level. Blue economy strategy development and MSP is part of a complex web of marine governance that also includes Integrated Coastal Zone Management (ICZM), Marine Protected Areas (MPA) and Locally Managed Marine Areas (LMMAs), providing planning across several scales of government. MPAs are critical for the protection and sustainable use of ocean waters, while at the local scale LMMAs can fill MPA gaps and engage local communities in the process of marine conservation. **Designated protection of coastal waters ultimately ensures future sustainability of ocean resources and future sources of food and livelihoods for urban residents, while mitigating some of the wider environmental damage of urbanisation processes.**

This report profiles the specific social, economic and environmental challenges and opportunities of the blue economy in coastal cities across certain key sectors:

Ports are crucial not just to national GDP but also the socio-economic performance of their host cities as illustrated by the Port of Durban which employs 53,000 people directly and an estimated 50,000 indirectly. However, as demonstrated by the Port of Mombasa, in WIO cities ports are typically nationally owned and operated assets. Local authorities have little involvement in port operations and are therefore vulnerable to decisions made at national level which may conflict with city aspirations. Nationally, there is a need to ensure that ports are supported by sufficient economic infrastructure such as road and rail, while at local level authorities may wish to work towards having greater input in city port operations and also ensure that the city economy is sufficiently diverse so local government is not overly reliant on an asset beyond their control. Ports also pose significant challenges to local waters through shipping processes including fuel and ballast water as well as land reclamation. Future port investment in WIO cities needs to be connected to Green Port conditions and certifications, to minimise environmental impact and cascading impact on other blue economy sectors such as fishing and tourism.

Coastal areas and coastal cities are key to the tourism sector in many WIO countries. For example, Durban accounted for 24% of tourism earnings for South Africa in 2015 and coastal tourism provides around 60% of overall tourism earnings in Kenya. For coastal cities challenges include, the need to protect the tourism sector from external shocks (such as terrorism and coronavirus) which dramatically affect visitor numbers and to ensure that tourist spending in cities filters down to local communities rather than remaining in foreign

owned, all-inclusive hotels. City responses included advertising campaigns, and diversification of tourism packages to cater more towards domestic visitors and conference guests, less susceptible than international tourists to external shocks, and more likely to visit and spend money in local communities. In Port Louis and other SIDS, a key challenge is how to attract visitors who normally bypass the city and head straight for more remote beach resorts. Recommendations include training and support services, loans, tax incentives, market research and advertising services—to support small and medium-sized businesses with a goal of expanding the city's tourist offerings. The report details evidence of community led ecotourism which can sustain both marine biodiversity and local livelihoods.

Fishing provides an important source of livelihood to fishermen in waters off the coast from WIO cities and to those engaged in fish processing and value addition. Fishing is also a crucial source of protein for city residents. Poor equipment including vessels and ancillary equipment reduces the potential of the fishing sector for local fishermen across several WIO countries and cities. Local fishermen are limited to nearby waters which are overfished as a result. Limited processing and storage facilities in WIO cities is another prohibitive factor meaning that much fish stock is wasted or little value added. For fishing potential to be realised in WIO cities these are two key areas of investment. Local community groups exist in most WIO cities, known as BMUs, fishing associations or similar. Supporting these community groups can increase local livelihood potential and more sustainable management of coastal waters.

Beyond these core sectors, exist a host of other urban challenges which impact the marine environment. Widespread deficiencies in sewage and solid waste management systems exist in small and large urban settlements alike. Sewage often goes into the ocean untreated. The resultant pollution inevitably has a negative impact on marine life, and as a consequence impacts blue economy sectors which rely on clean waters, such as fishing and tourism. Moreover, future economic development projects need to be fully aware that they can stimulate further population growth and need to plan accordingly. Education is key to local employment and research across sectors demonstrated the importance of technical training and skills development of local populations across blue sectors for national and local blue economy aspirations to be realised and for communities to benefit. Finally, population and infrastructure in WIO cities are particularly vulnerable to the future impacts of climate change. **For the blue economy to flourish in coastal cities, service provision challenges must be addressed alongside or as part of specific blue economy investments, as part of holistic programming, integrated with wider resilient urban planning and climate adaptation.**

The final chapter of this report summarises key economic, social and environmental blue economy recommendations, across blue economy sectors, in response to the issues raised. Recommendations were established through a rigorous prioritisation process which involved the consultation of marine experts across the WIO region. These recommendations are elaborated upon further in the 'Strategic Roadmap' for WIO coastal cities, which is the partner document to this report. Strengthening the blue economy in WIO coastal cities will involve a mix of cross-cutting strategies, and sector-specific policies that focus on growing local capacity in established blue economy sectors, alongside further exploration and investment in new and developing blue economy sectors. Any future blue economy city strategies of course need to coordinate with wider city visions and be coordinated with national plans and objectives. **It is intended that this report and the accompanying documents within this project portfolio provide a solid foundation for future urban blue economy planning across the region.**

CHAPTER 1

THE BLUE ECONOMY

Oceans are the site of complex socio-economic and environmental processes, challenges and opportunities. They are key to the economic development of coastal countries and direct provision of livelihoods for coastal populations and indirect livelihoods of many others. However, climate change, pollution and insufficient consideration for environmental and social sustainability are putting the ocean's resources at risk, hampering the socio-economic benefits that the ocean might deliver for future generations.[1] Cities have a key role to play in sustainable use of ocean resources, as recognised in key global agendas.

▸ Image: Victoria Seychelles © Sapsiwai, Adobe

1.1. INTRODUCTION

According to estimates by the Global Ocean Commission, ocean resources contribute 5% of the world's GDP,[2] and impact the livelihoods of 350 million.[3] The majority of people who depend on the ocean for their livelihood live in developing countries.[4] Ocean-based industries such as fisheries and tourism are critical providers of employment and income.

While, in some Asian countries (e.g. Indonesia), the blue economy can account for up to 20% of total GDP, the WIO region is yet to reach such maturity.[5] For example, the blue economy in Kenya currently only contributes 2.5% to national GDP.[6] UNECA estimate blue economy activities can in future contribute up to 27% of East African nations' revenue and 33% of exports.[7] National governments are responding to this opportunity through the development of blue economy strategies, currently at varying levels of maturity, ranging from South Africa and Mauritius who are in relatively advanced stages of planning, through to Mozambique and Madagascar who are in early planning stages (see Chapter 3).

Cities have a key role in the protection and sustainable management of marine resources as noted in both the Sustainable Development Goals (SDGs) and New Urban Agenda. At the Nairobi Convention COP 9, countries of the region acknowledged the need to address the environmental challenges and opportunities posed by rapid urbanization to WIO coastal cities, and for coastal cities to advance blue economy approaches in the context of SDG 14 (Life Below Water), as a pathway for sustained incomes and economic benefits from natural blue capital. Still, blue economy projects are often instigated at national level with local authorities limited in their ability to engage in these challenges. UN Habitat note the need for coordination across all levels of government for outcomes that balance economic, social and environmental priorities.[11]

WHAT IS THE BLUE ECONOMY?

The blue economy is a concept gaining growing attention and awareness in both academic and policy circles[b] which include some distinct yet complementary definitions:

> "Promotes sustainable use of ocean resources for economic growth, improved livelihood and jobs, and ocean ecosystem health."
>
> **(World Bank, 2017)[8]**

> "Shift from the old, "brown" business-as-usual development model where oceans are perceived as a means of free resource extraction and waste dumping....key sectors include fishing; biotech; minerals; renewable energy; shipping, port & maritime logistics; tourism & leisure; & marine construction, manufacturing; commerce, ICT; & education and research."[c]
>
> **(Roy 2019)[9]**

> "Includes economic benefits that may not be marketed, such as carbon storage, coastal protection, cultural values and biodiversity."
>
> **(Conservation International, 2018)**

Perhaps the most comprehensive definition comes from Attri and Bohler-Mulleris, (2018):

> **"Reframing the oceans as development spaces; Decoupling socio-economic development from environmental degradation; Improved relevant international law and governance mechanisms; Prioritising the use of coastal and marine environment to benefit people, alleviate poverty, generate employment and promote equity"[10]**

(b) Google Scholar 263 academic mentions of "blue economy" up to end of 2009; 6690 since 2009 and 4710 of those since 2015.

(c) For full description see Appendix 1

COASTAL CITIES AND THE WIO REGION

The WIO mainland coast is 13 000 km long and stretches from Somalia to South Africa.[12] Over centuries, the Indian Ocean region has been providing both a unique marine ecosystem and global strategic connectivity.

1.2. RESEARCH APPROACH & REPORT STRUCTURE

This Status Report details the current situation of coastal cities and the blue economy across eight study countries, addressing 4 key questions:

- What is the significance (importance/value) of coastal cities with respect to the blue economy? - Chapter 2
- How can coastal city administrations engage in the blue economy (i.e. their mandate and capacity) and what roles do other stakeholders play in the blue economy? - Chapter 3
- What are the economic, social and environmental challenges and opportunities of the blue economy in coastal cities? - Chapter 4
- What are the policy and planning implications of these interrelated challenges and opportunities in coastal cities? - Chapter 5

Challenges and Opportunities in Chapter 4 are explored through key city blue economy sectors: Port and Maritime Trade, Fishing, Tourism and Waterfront Development. (See Chapter 4 for more information).

The Status Report blends both secondary research across cities of the WIO region and primary findings from the city case study research. Selection of Dar es Salaam, Port Louis, Mombasa and Kilifi Town as 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 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.

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). Researchers consulted 85 stakeholders across the 4 cities. 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).

The final chapters of this Status Report summarise key blue economy issues for WIO cities and highlight some key recommendations, which are detailed in full in the Roadmap. Recommendations respond to the city challenges and opportunities uncovered during primary and secondary research and presented in Chapter 4. The Roadmap uses a modified Delphi methodology to prioritise a long list of blue economy recommendations. The Delphi method is explained in detail within the Roadmap document.

TYPOLOGIES OF WIO COASTAL CITIES

Coastal cities examined in this Status Report vary considerably in population size, geography and governance.

Mainland WIO cities are parts of complex economic and transport corridors, connecting cities along the coast with inland cities and the hinterland (See Chapter 2). Mainland cities include major settlements such as Durban, Dar es Salaam, Mombasa and Maputo; and smaller cities and rapidly growing towns such as Lamu, Kilifi Town and Bagamoyo. Significant variations exist between mainland cities across levels of economic and administrative capacity, municipal devolution and infrastructure development.

Island cities of the WIO region frequently hold disproportionate national significance as population centres but obviously do not have such inland country connectivity. Many islands typically also have lower levels of decentralisation relative to their mainland counterparts, discussed further in Chapters 2 and 3. Island cities include Port Louis, Victoria, and Toamasina.

Nevertheless, many circumstances, challenges and opportunities are shared by all cities examined in this report. For example, most studied cities have ports, which have a significant influence on the local economic, social and environmental conditions of urban spaces. Similarly, key industries such as tourism and fishing are relevant to cities within both typologies. The report therefore does not apply strict sorting of typologies but rather sporadically refers to differences in city typology where useful. E.g. acknowledging the importance of mainland 'urban corridors' that extend the influence of urban areas into hinterland areas.

COVID 19

This research was largely undertaken between January and early March 2020, before the extent of the COVID-19 global impact had been realised. Findings reflect this fact, although the impact of COVID-19 has been acknowledged in certain sections. The long term economic, social and environmental impacts of the pandemic generally, and with respect to the blue economy are still to be fully established, although a limited number of reports on the subject have been published with some early sectoral findings outlined below.

BLUE ECONOMY AND COVID-19 KEY (GLOBAL) FINDINGS

PORT AND MARITIME TRADE

Slowdowns in global value chains will reduce demand for maritime transport services somewhat and container lines lost 4% of volume during first quarter compared to previous year, but as of April 2020 the impact on freight transport appears less dramatic than on tourism.[13]

TOURISM

Travel restrictions and refinement have severely impacted the travel industry, including coastal tourism, exposing millions of livelihoods globally. The most pessimistic forecasts point to a global loss of US$2.1 trillion in GDP for the year 2020.[14]

FISHERIES

Falling consumer demand due to disrupted trade routes, restaurant and hotel closures during lockdown and increased sanitation requirements. Conversely, there may be some related recovery of fish stocks during this time.[15]

▸ Image: Aerial shot, Durban

CHAPTER 2

SIGNIFICANCE OF COASTAL CITIES TO THE BLUE ECONOMY

Cities are where the majority of economic activity related to the blue economy takes place. Rapid unplanned growth of coastal cities coupled with high consumption also threatens the future sustainability of ocean resources.

▸ Image: Dar es Salaam © Di Moiz, Adobe

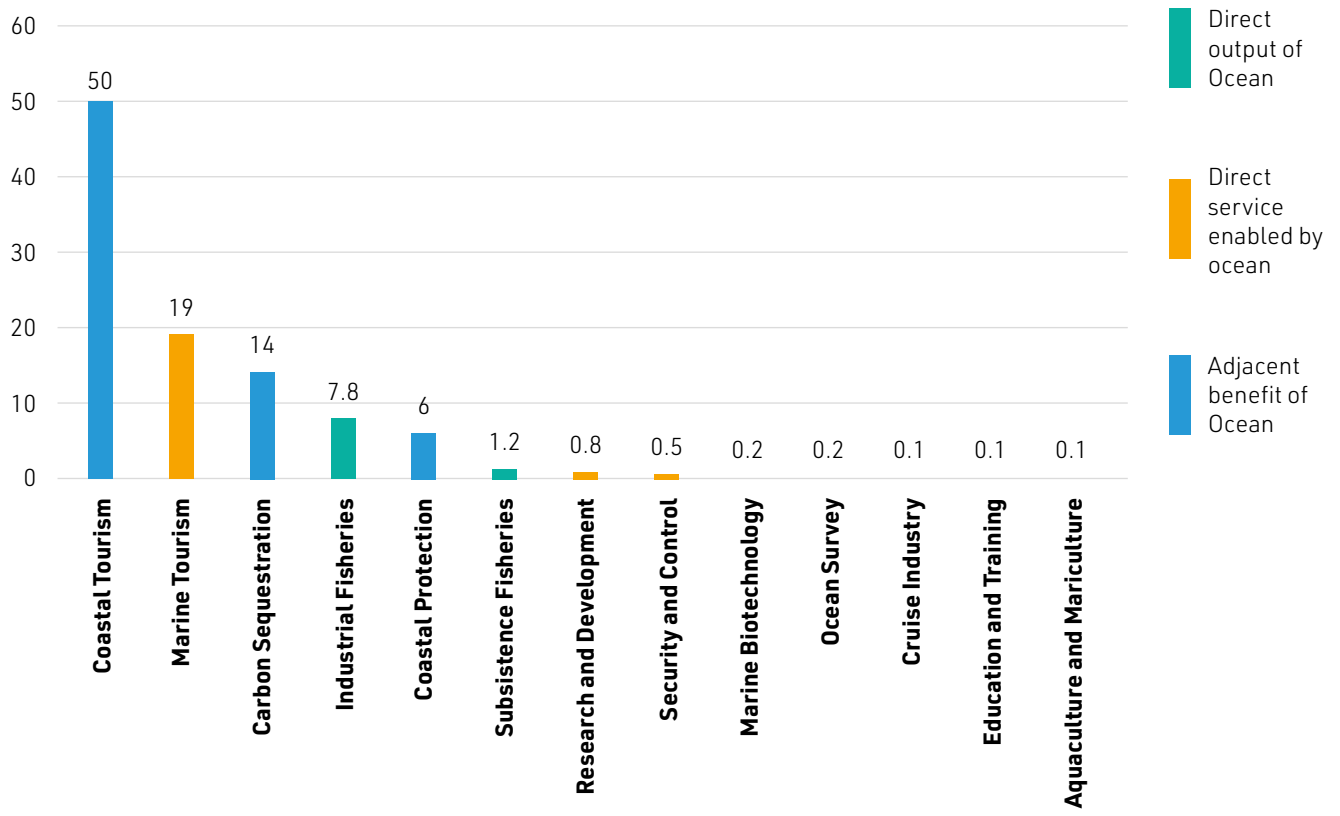
The World Wildlife Fund (WWF) estimate the size of economic sectors dependent on the ecological functions of the sea across the WIO to be US$333.8 billion in asset value and **US$20.8 billion in annual gross marine product (GMP)**.[16] (See Figure 1).

GMP largely comprises of tourism-based activities which make up 69% of the $333.8 billion total. WWF's estimate excludes sectors not dependent on marine ecological functionality, including ports and maritime trade, oil/gas and other extractive sectors. This point is important as sub-Saharan Africa carries out 90% of its trade via sea[17] and the oil and gas sector is showing considerable growth in the WIO region.[18]

From an economic perspective, tourism, ports and maritime trade, fisheries, and waterfront development are key blue economy sectors. The relationship between these sectors and coastal cities is one of co-dependence in two ways:

1. **Core functions, critical infrastructure and workforce of each blue economy sector are situated in cities. These elements are in turn are dependent on other supporting urban infrastructure.**
2. **Rapid, unplanned and unsustainable growth of coastal cities can negatively impact the marine environment and in turn, the blue economy sectors that depend on the ecological functions of the sea. Paradoxically, the economic opportunities provided by ocean resources are what is in part driving population growth in coastal areas.**

FIGURE 1 - % BREAKDOWN OF WWF CALCULATION OF WIO GMP (TOTAL $20.8BN)



2.1. CORE BLUE ECONOMY FUNCTIONS AND ASSETS ARE SITUATED IN CITIES

Coastal cities play an outsized role in the economic health and blue economy performance of the WIO region. These gateways of trade and transport are critical to national and regional development; popular destinations for tourists visiting the WIO coast; locations where fishing catches are processed and sold on the domestic market; and centres of employment serving the above sectors and others such as oil, gas and marine energy.

PORTS

- **Globally, over 80% of international goods traded are transported by sea.[19] Port cities are of significant national importance**, supporting direct and indirect local and national economic activity, employment and food security amongst other factors.[20]
- **It is estimated that port demand volume in Africa will grow by 6-8 times by 2040.[21] This presents a significant opportunity for national and local economic growth.**

TOURISM

- **An estimated 80% of global tourism takes place in coastal locations.[22] Coastal cities are typically the entry point to the coastal region to visitors by sea, rail and air and destinations in their own right. WWF calculates that coastal and marine tourism contributes US$14.35 billion to the WIO region annually.**[23]

FISHERIES

- **Coastal cities also act as hubs for the fishing industry, supporting communities of the WIO that are dependent on fish for protein and livelihoods.[24]** Fishing is a vital sector of the economies of the island states located across the WIO Region comprising an estimated 8% of Comoros GDP, 6% of Madagascar GDP, 9% of Seychelles GDP.[25]

These, and other blue economy industries hold significant importance to the economic and socio-development prospects of WIO countries and they depend on functioning, productive cities. For instance, the projected growth in port volume poses significant capacity and productivity challenges to port cities, for the port and for wider supporting infrastructure. These capacity challenges must be met for economic prosperity to be achieved. If these challenges are met then blue economy development can support local population and national economic objectives, but failure to meet such capacity challenges can have negative impacts not only on direct blue economy economic performance but also on wider socio-economic conditions within the city (e.g. impacts of increased congestion and competition for essential services). Furthermore, port creation, tourism development and fishing industry all need to be managed in an environmentally responsible fashion, or risk direct negative environmental impacts.[26]

The infographic overleaf emphasises the importance that major coastal WIO cities already hold. Looking ahead, there are many secondary cities set to rapidly develop in the coming decades and make major contributions to national economies. For instance, Richards Bay has grown from a small fishing village, pre-1970, to a major node of the South African economy, primarily due to state intervention including the development of a deepwater harbour and substantial road and rail investment.

Blue economy sectors do not necessarily exist in harmony, with competing demands on ocean resources. As the city is a key space in which these activities take place, it is also where competing demands must be managed.

▸ Image: Durban Harbour and City © Chris Van Lenne, Adobe

COASTAL CITIES PLAY AN OUTSIZED ROLE IN THE ECONOMIC HEALTH AND BLUE ECONOMY PERFORMANCE OF THE WIO REGION

PORTS

Transport and Trade Corridors, Sub-Saharan Africa Source: PwC, 2019

In Mozambique, the **Port of Beira** provides

CONNECTIONS TO THE HINTERLAND

of Zimbabwe, Malawi and Zambia; and the Port of Maputo connects to Zimbabwe, Botswana and South Africa, making significant contribution to regional economic integration'.[44]

Mombasa is the

ENTRY AND EXIT

port not only for Kenya but also Uganda, northern Tanzania, Burundi, Rwanda, and Eastern DRC.

World Bank consider **Dar es Salaam** as

"VITAL FOR THE ECONOMIES OF TANZANIA AND NEIGHBOURING COUNTRIES"

as a regional hub for six landlocked countries. [45]

TOURISM

In **Tanzania**, approximately

2.4 MILLION

passengers travel through **Dar es Salaam's Julius Nyerere Airport** annually.[35]

Visitors to **Zanzibar** doubled

FROM 150,000 TO 376,000

over the past decade,[36] with the UNESCO World Heritage site **Stone Town**, part of Zanzibar City, an important cultural attraction.

FISHERIES

In Mauritius,

150,000 TONNES

of fish are handled in the port of **Port Louis** each year.[39]

In Seychelles, the

COMMERCIAL FISHING

port is located in **Greater Victoria**.[40]

(d) Durban is the biggest port in South Africa in terms of container movement but as a bulk port Richards Bay handles most tonnage.

Port Victoria handles

95%

of imports to the Seychelles.

Port Louis handles

99%

of Mauritius' external trade and has become an important hub for transhipment of containers between other countries.[32]

Toamasina is crucial for the Madagascan economy. Its port handles

90%

of the country's international trade.[33] In 2016, more than

$500M

worth of textile products were exported through the port of Toamasina.[34]

The port of **Dar es Salaam** handles

95%

of national trade.[27] In 2012, around US$15 billion of merchandise (60% of Tanzania's GDP) transited through the port.[28]

Durban is the largest and busiest port in Sub-Saharan Africa.

65%

of all goods imported into South Africa enter through Durban's harbour.[29]

Richards Bay handles in excess of 80 million tons annually, representing

50-60%

of South Africa's seaborne cargo (by weight).[d,30,31]

In **Kenya**, coastal tourism now contributes around

60%

of overall tourism earnings and 30% of hotel beds are in coastal beach areas.[37] The region is attractive to both domestic and international tourists.[38]

In **South Africa**, the direct annual value of coastal tourism in 2016 was estimated at R26Bn ($1.37billion). Eco-tourism alone was worth R2Bn to the economy.[46]

URBAN AREAS CONSTITUTE 75% OF TOURISM SPENDING WITH DURBAN ACCOUNTING FOR 24% IN 2015.[47]

Moi International Airport,

MOMBASA IS A KEY ENTRY POINT TO THE COAST,

with the city also a popular destination in its own right.

In Comoros,

MORONI IS THE CENTRE OF THE COUNTRY'S CULTURAL HERITAGE, AS WELL AS THE PRIMARY LANDING SPOT FOR MOTORISED FISHING BOATS

and the location of the fisheries monitoring centre. Based on the experience of Seychelles, the African Development Bank noted that the blue economy, particularly tourism and fishing can drive economic diversification and job creation in Comoros.[41,42]

▸ Image: Fisherman, South Africa. © Peter Chadwick

2.2. RAPID URBAN GROWTH AND THE MARINE ENVIRONMENT

Coastal cities are characterized by sizeable and rapidly growing populations mostly due to their economic importance. Approximately 50% of the global population live within 200km of a coastline thus coastal areas exhibit significantly higher population densities while coastal population growth and urbanisation rates outstrip the demographic development of the hinterland.[48] Since 2010, the urban population across the research countries has increased by approximately 30 million (or 43%). By 2050, this urban population is projected to more than double, with 148.6 million new urbanites in the study region.[49] Without proper planning and investment rapid urban growth can:

- Place unmanageable pressure on the marine environment (with significant environmental, social and economic consequences) which in turn impact blue economy sectors; and
- Leave population and infrastructure increasingly exposed and vulnerable to climate change.

Looking at Figure 2, major coastal cities in Kenya, Tanzania, Madagascar and Mozambique are expected to increase in population size by 60% or more 2020-2035. Most notable is Dar es Salaam, where the 2020 population (estimated 6 million) is expected to expand by more than 85% through 2025, double by 2035, and could reach 21.4 million people by 2052.[50] Zanzibar and Toamasina are also expected to grow rapidly, doubling by 2035. The exception is in South Africa, where Durban, Port Elizabeth and East London are only expected to increase by 20-23% each. South Africa is already the most urbanised research country at 67.4% and that figure is only expected to rise by 6.9% by 2035.[51]

Exact city population growth projections were not available for Small island developing states (SIDS) but **urban population growth on Seychelles and Mauritius is small, in absolute terms, or even declining.**[52] On Comoros, the capital Moroni is experiencing rapid population growth but relative to other cities it has a small population of only 65,000 inhabitants.[53]

Figure 2 only presents the projected growth of cities with populations of greater than 300,000. **A range of secondary cities and smaller settlements are the site of significant economic development and projected to experience rapid growth in the coming decades**. This includes current strategic port locations like Lamu, Kenya where some estimates suggest that the population may reach 1.25 million by 2050, due to port-related urban growth, a dramatic increase on the estimated present population of approximately 50,000.[54]

There is considerable opportunity for growth in WIO coastal cities' contribution to national GDP. Globally coastal cities are projected to outpace GDP growth of inland cities. However, many WIO coastal cities currently contribute comparatively little to national GDP, e.g. Mombasa (4.7%).[55] In contrast, West African coastal cities currently account for approximately half of their regions' GDP with GDP projected to triple over 15 years.[56] A significant opportunity for WIO local governments is to determine how to ground more economic activity within the city itself and internalise the benefits of trade and tourism, in particular, through value addition within local supply chain services.

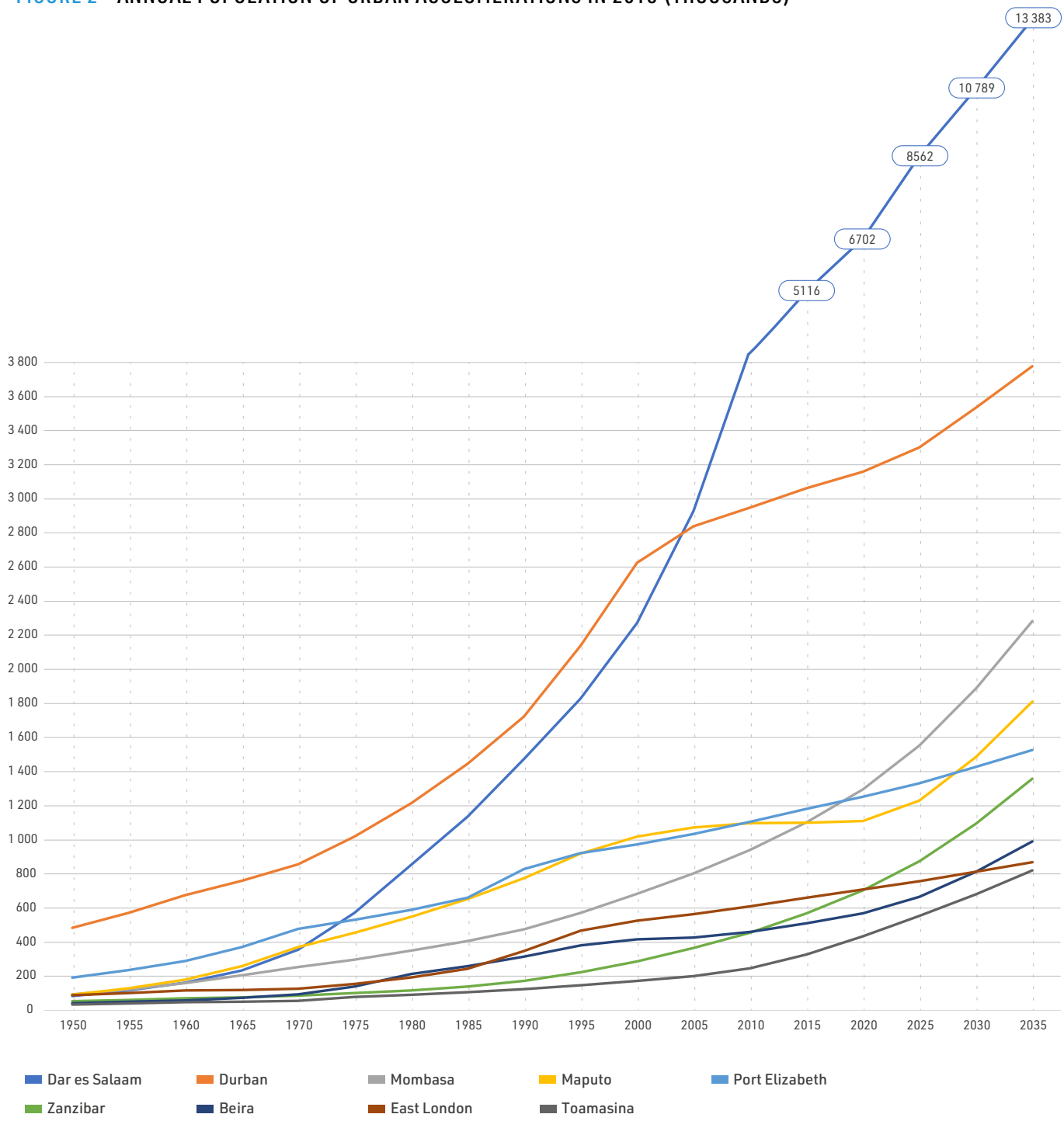
Population growth in WIO coastal cities has outpaced planning and investment which has led to a deficit of supporting social and economic infrastructure. For example, in port cities like Dar es Salaam and Mombasa, sewage infrastructure and other systems have not matched population growth over the decades, presenting significant socioeconomic and environmental challenges including pollution of coastal waters. Pollution of coastal waters threatens blue economy sectors such as fishing and tourism which depend on a healthy marine environment.

Land degradation and destruction of marine habitats negatively impact the blue economy in many WIO cities, challenging urban planning guidance[57] and enforcement. Globally it is estimated that half of the world's wetlands disappeared in the 20th century and that 50% of all mangroves, and nearly 60% of coral reefs, are seriously degraded, in some cases beyond recovery.[58] Population pressures combined with poor governance, poverty and inequality have been blamed for mangrove degradation in East Africa. Between 1980 and 2005 FAO estimated that 8% of mangrove cover had been lost in the region.[59] Mangroves form a key part of the marine ecosystem, with importance not just to ecologically dependent blue economy sectors but also to protection from sea-level rise and coastal flooding.

Rapidly growing secondary cities need urgent action in planning and implementation to ensure the same infrastructure challenges do not occur in those settlements. As the International Growth Centre note:

"The lack of policy action today is storing up costly problems for the future; infrastructure and land rights are extremely difficult to retrofit. ...only if governments plan in advance will they get it right the first time."[60]

FIGURE 2 - ANNUAL POPULATION OF URBAN AGGLOMERATIONS IN 2018 (THOUSANDS)



▸ Source: UNDESA, 2020 - https://population.un.org/wup

▸ Image: Mida Creek Mangrove Conservation Area, Kilifi County

REGIONAL IMPACTS OF CLIMATE CHANGE AND THE BLUE ECONOMY

Globally, more than 600 million people (around 10 % of the world's population) live in coastal areas that are less than 10 meters above sea level.[61]

Population growth in the WIO region coincides with increased effects of climate change. High population densities along the coast are particularly vulnerable to climate change impacts.

Climate change will impact industries critical to the blue economy throughout the WIO region in direct and indirect ways. For example, destruction of coral reefs in the East Africa coral reef bioregion, which stretches from Somalia to South Africa, could harm biodiversity and reduce eco-tourism.[62] Destruction of coral reefs has already impacted biodiversity, reducing fish stocks and fishing in parts of East Africa, reflecting a global trend: it is predicted that climate change will "reduce fish catches by 7.7% and revenues from it by 10.4% by 2050 under a high C02 emissions scenario".[63] Impacts on two other industries – maritime trade and marine energy – are likely more difficult to anticipate. Increased regulation around shipping may impact the type and number of vessels travelling through ports. Effects on the oil and gas industry are similarly difficult to anticipate, though efforts to reduce C02 emissions may impact the market for fossil fuels and, harsher working conditions (e.g. high heat) and more inhospitable climate for infrastructure (including extreme weather events) may impact production more directly.

Secondary or indirect impacts from high heat, precipitation and water stress (with knock-on effects on rain-fed food production and food security) may include increased migration away from vulnerable areas and towards cities, putting additional burden on governments. Stress on local populations include higher heat, diminished water supply, increased occurrence and intensity of disease outbreaks, flooding, and more frequent and intense extreme weather (including rain storms, flooding, fires, hurricanes, and tropical storms). Beyond the potential and significant loss of life and property, these stresses will require capital investment and take a toll on human resources and productivity, impacting the health of local economies in coastal cities.[64]

Detailed exploration of the impact of climate change is complex and beyond the scope of this report, which focuses on the current state of the blue economy in the region and trends that will likely impact immediate and future developments. Still, anticipated climate impacts should inform all future planning. Investments in the blue economy must recognize and mitigate potential impacts of climate change on local industries wherever possible.

Efforts to support and grow the blue economy in the WIO region should prioritize a resilience-based approach that adopts adaptive and robust actions, informed by the best available science.

2.3. COASTAL CITIES ARE BLUE ECONOMY ANCHORS

To summarise this chapter, coastal cities are gateways for goods, services and people, owing to their strategic locations, associated infrastructure investment and available workforce to utilise the surrounding rich coastal and marine environments. They underpin key blue economy sectors. Coastal cities therefore play a key role in future regional prosperity and security. The scale of involvement of coastal cities in trade alone, make them of strategic national importance.

Tourism and fishing tend to concentrate in coastal areas which further establishes coastal cities as centres for economic growth and anchors of the blue economy that require careful management of marine and coastal resources, including both the impact of blue economy sectors on marine ecosystems but also management of conflict between competing blue economy sectors.

Coastal cities and the blue economy form a reciprocal relationship in the sense that coastal cities support national blue economic prosperity, and the blue economy also influences the sustainability of future urban growth and economic development.

However, rapid, poorly managed urban growth presents challenges to the marine environment which can in turn threaten the future sustainability of certain blue economy sectors. Moreover, growth of blue economy sectors can itself influence the size, shape and service demand in these cities. The cumulative impact of small but unplanned and rapidly growing cities presents a notable threat, alongside growing environmental pressures in existing major coastal cities.[e] If cities are not functioning, then the performance of blue economy sectors will be adversely impacted.

The city is where the above challenges exist, so it is where they must be managed. City level actors, particularly in mainland WIO cities have an important role to play in the blue economy. This role includes the planning of physical, economic and social urban infrastructure that influences and is influenced by blue economy development, as well as a significant role in the direct operations of certain blue economy sectors. Chapter 3 will explore the mandate of WIO cities in greater detail.

(e) The economic, social and environmental challenges and opportunities associated with this relationship will be discussed at length in Chapter 4.

▸ Image: Port and wider city, Dar es Salaam © Druid007, Adobe

CHAPTER 3

BLUE ECONOMY GOVERNANCE

City administrations (especially on the mainland) play a central role in developing the blue economy in the WIO region by providing regulatory and policy guidance, managing the operation of various urban infrastructure systems; securing resources and incentivising investment. However, national governments still have primary responsibility for certain blue economy sectors, produce policies that may impact cities and disburse federal funds that support urban development related to the blue economy. Significant blue economy projects are often instigated by national government with private sector partnership and foreign direct investment (FDI). Blue economy strategies need to be coordinated across governance scales and with new and existing marine and coastal planning tools.

▸ Image: Maputo © Malajscy, Adobe

3.1. DECENTRALISATION AND DEVOLVED POWERS

The mandate and financial capacity of coastal city administrations varies considerably across WIO countries. SIDS tend to have relatively low levels of decentralisation and/or local authorities are undermined by low fiscal capacity. Mainland WIO cities have greater devolved powers than their island counterparts but still vary in levels of fiscal devolution and local capacity. The varying degree of government service responsibility for ports, tourism and fishing is summarised in Table 1.

Of all WIO research countries[f] **Seychelles, has the lowest percentage municipal budget allocation and local authorities have the least responsibilities.**[65] Local government expenditure as a percentage of total government expenditure was just 0.6% in 2013/14. (In contrast South Africa was 8.8%).[66] National Government was responsible for the city of Victoria Masterplan 2040, implemented through public sector, private sector and investors.[67]

Local authorities in Mauritius also have limited mandate and financial responsibility but somewhat greater than Seychelles. Mandate includes local business development, solid waste management and public health. Local government expenditure was 3.0% of total government expenditure 2016/17.[68]

On both Comoros and Madagascar the role of local government is important as it is suggested to have greater stability than other levels of government. However, decentralisation is undermined by low fiscal autonomy and limited budgets.[69,70] In response to budget limitations, cities are deploying financial mobilisation efforts at the local level, including some support from diaspora to cities on Comoros[71] and the establishment of outside partnerships by Madagascan communes with private sector and local authorities from Europe.[72]

In South Africa, significant revenue-raising responsibilities have been devolved to both provincial and municipal levels. Provincial governments struggle with a low tax base and yield and are almost entirely dependent on national grants.[73] Meanwhile, municipal government has responsibility for high yield taxation including property tax and water and electricity surcharges meaning approximately **80% of municipal expenditure is raised at the municipal level.**[74] **Terrestrial spatial planning takes place at municipal level,** legislated by the Spatial Planning and Land Use Management Act 2013.[75] [g, h]

In Kenya, while county governments are responsible for property and business rates[76] and essential services such as solid waste,[77] collection of taxes since devolution has been low-yield and the county governments have been largely dependent on national transfers.[78,79] A new draft policy and County Revenue Bill was adopted in 2018 to broaden the county revenue base and improve collections but implementation challenges remain.[i,80] Progress in developing local spatial land-use plans varies by county, with some counties making greater progress than others. Devolution was only institutionalised in Kenya in 2013 and **county government departments are still building planning capacity. Challenges are greatest in smaller secondary cities which in many cases at present only have 1-2 urban planners** and no GIS planning capacity.[81]

In Mozambique, **local government units have significantly lower financial and administrative capacity to fulfil their responsibilities than other mainland local administrations.** For example, in Nacala City, research has highlighted that municipal and provincial governments are not directly involved in decision making regarding economic investments, and co-ordination with national level arm's length bodies is limited.[82]

Finally, the institutional structure of Tanzania **is complex and fragmented, metropolitan governance complicated and less effective.**[83] Decentralisation arrangements differ between the mainland and Zanzibar.[j,84] **Ministries and agencies of the central government retain control over important functions and drive policy formulation.**[85]

(f) Data unavailable for Comoros

(g) Terrestrial planning involves the development of long-term city strategic visions, periodic (5 year) Integrated Development Plans (IDP) for implementation of strategic visions, and a spatial plan which depicts the IDP on a spatial basis, providing a GIS based land-use plan.
(h) Planning status varies across WIO cities depending on devolution progress and planning capacity but master plans in many cases are outdated, based on lower population growth rates and poverty levels.

(i) Adam Smith International suggest implementation required a better understanding of revenue-raising opportunities including greater taxation from property rates and the impacts of longer-term administrative capacity and legislative reform.

(j) Zanzibar is divided into 11 LGAs, (6 urban, 5 rural) of varying capacity. Dar es Salaam has a regional and city administrations, and the city also has 5 districts governed by their own Municipal Councils who report directly to the Prime Minister's Office.

Table 1 confirms the **limited blue economy mandate of local authorities on SIDS.** However, the table also highlights that even if local authorities are not responsible for large scale blue economy programs, they do have responsibility for some aspects of urban service provision affecting and affected by blue economy programming. While local government influence should be read in the context of limited local budgets and strategic planning responsibility, (particularly in the case of Seychelles), the table does still illustrate that all **local WIO governments have some degree of service responsibility for services which support the blue economy and therefore should be involved in national blue economy activities** discussed hereafter.

On the mainland, tourism is one key blue economy sector which is influenced at the local authority level, while fishing varies across mainland cities. **Major WIO ports are typically overseen by national authorities or parastatals.** In fact, this is the case across WIO cities, with the exception of Moroni which is privately operated (see Table 1).[88,89]

It should also be noted that while some local authorities have some service responsibility in blue economy sectors such as fishing and tourism, the success of these sectors is to an extent dependent on nationally driven projects e.g. airport expansion and coastguard formation.[95]

TABLE 1 - NATIONAL-LOCAL GOVERNANCE OF KEY BE SECTORS

	Mauritius*		Seychelles		Kenya		Mozambique			South Africa			Tanzania *	
	National	Local	National	Local (District)	National	Local (County)	National	Province	Local (Municipal)	National	Province	Local (Municipal &/or district)	National	Local (Urban)
PORTS	■		■		■		■			■		****	■	
TOURISM	■		■		**	■	▒	▒	▒	▒	▒	▒	▒	▒
FISHING	■		■		**	■	■			■			▒	▒
ROADS * **	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
WATER & SANITATION	■		■			■	▒		▒			■		■
SOLID WASTE		■	■			■	▒		▒			■		■
TOWN PLANNING	■		▒	▒		■	▒	▒	▒			■		■
EDUCATION	■		▒	▒	▒	▒	▒	▒	▒	▒	▒		▒	▒

■ Sole responsibility service

▒ Joint responsibility service

- Sources Ports[86], all other rows[87]
- * In Mauritius national services on the Island of Rodrigues are delivered by Rodrigues Regional Assembly and in Tanzania, on Zanzibar by Zanzibar assembly
- ** While county government may have service responsibility, primary research suggests national government play a major role in finance and implementation of major sector projects.
- *** Typically local government tends to be responsible for urban roads but national government plays key role in national strategic roads
- **** In SA, local government also has some influence on ports, discussed in Chapter 4.

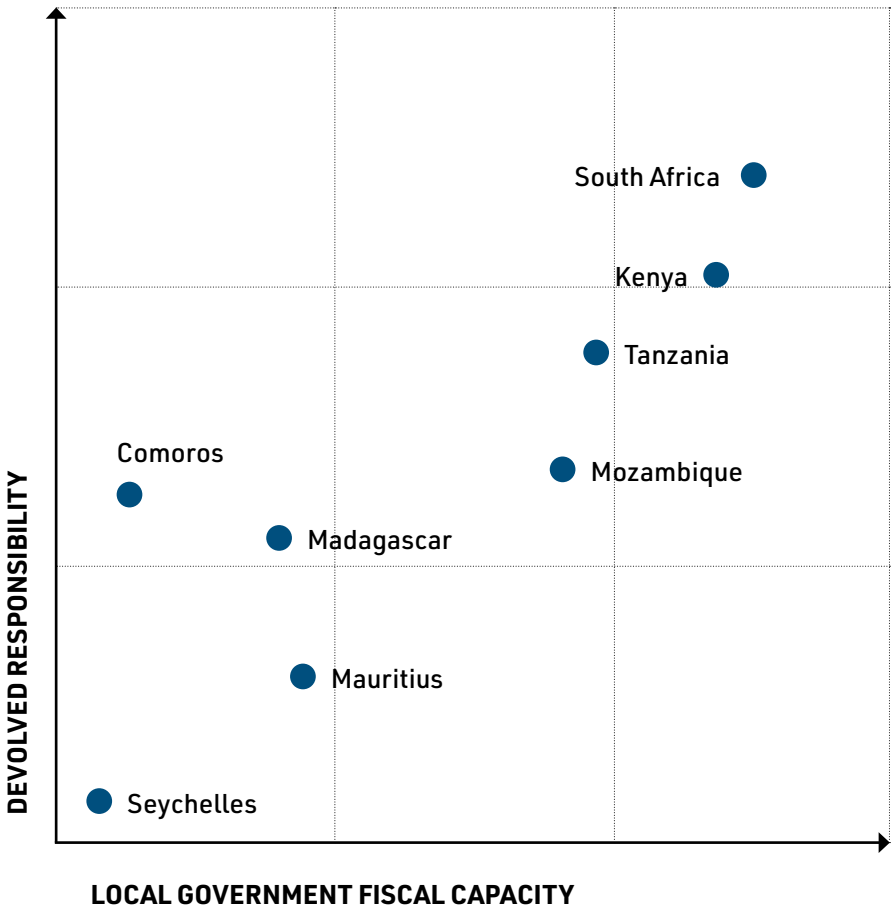
PORT AND FOREIGN INVESTMENT

Ports are also an attractive node for foreign investment, most notably from China. Port investment provides China a gateway to African trade and economic development opportunities and political leverage on the continent.[90] Not only does China offer funding, it has the required engineering knowledge and labour to rapidly execute the projects it is financing.[91]

Chinese FDI in the region has increased significantly over the last decade. There are at least 46 existing or planned port projects in sub-Saharan Africa, which are funded, built, and or operated by Chinese entities. Chinese investment was present in roughly 17 percent of the 172 sub-Saharan African ports captured in the 2017 World Port Index.[92]

Multi-lateral agencies are also playing a key role in WIO city port expansion. In Dar es Salaam, the World Bank has approved $345 million credit and $12 million grant to the new Dar es Salaam Maritime Gateway Project to increase the capacity of the port to 25 million tonnes between 2017-24 and improve waiting time to berth from 80 to 30 hours and expansion to Mombasa's port is being funded by the European Investment Bank and JICA.[93,94]

FIGURE 3 - ILLUSTRATION OF LOCAL DEVOLVED POWER INCLUDING BLUE ECONOMY RESPONSIBILITY OF WIO COUNTRIES



3.2. BLUE ECONOMY STRATEGY AND PLANNING

The degree of national administrative and fiscal devolution in WIO countries correlates with the extent to which local governments are involved in blue economy strategic planning and investment, and marine and coastal planning.

MARINE AND COASTAL PLANNING

Like terrestrial planning, **Marine Spatial Planning (MSP)** is a method of improving decision-making and spatial management within a given area. MSP is a plan-led framework that enables integrated decision-making on the use of the sea. If implemented correctly, MSP can provide a forward-looking, ecosystem-based approach to the management of marine activities, and a transparent process of conflict resolution where there are competing stakeholder demands (e.g. fishing vs tourism). MSP can set rules which inform blue economy strategies. MSP has been shown to provide social benefits including improved opportunities for community participation in planning and decisions.[96] WIO countries are at varying stages of MSP development.[97] In some WIO countries MSP is only undertaken nationally, but in others there are also local MSPs in various stages of formulation.

Terminologically MSP may have some overlap with **Integrated Coastal Zone Management (ICZM).** Whilst MSP and ICZM both involve a strategic approach to planning in the marine environment, typically, ICZM is applied to marine zones located less than 2km from the coast while MSP can be applied to much wider areas such as coastal watersheds or Exclusive Economic Zones (EEZ).

A **Marine Protected Area (MPA)** is an ocean area reserved by law or other effective means. MPA designation pre-dates MSP and existing MPAs need to be integrated into broader MSP processes.[98] In the WIO region, MPAs date back to the late 1960s, with widespread adoption beginning in the 1980s.[99] WIO countries have over 155,500 km^2 of protected areas between them.[100] All study countries have multiple MPAs. Several are in city areas. While blue economy strategies may not always effectively prioritise environmental protection, MPAs specifically protect from harmful activities e.g. overfishing. Some actors see MPAs as restrictive to economic activity, but the benefits extend beyond conservation and MPAs offer valuable sites for diving, related tourism and fish stock recovery.[101] MPAs are vital for the future sustainability of ocean ecosystems and therefore resources (such as fish stocks and corals).

Locally Managed Marine Areas (LMMAs) offer a mechanism to enable communities to engage in the blue economy. LMMAs are areas of protected ocean space which tend to be smaller than MPAs. Local communities typically work together to balance local blue economy activities within LMMAs. These areas have the potential to fill conservation gaps between MPAs. All study countries have LMMAs ranging from 70 in Madagascar to 2 in Comoros.[102]

The Seychelles national government has established a specific Blue Economy Department to oversee completion and implementation of a Blue Economy Strategic Policy Framework and Roadmap 2018-2030. This Framework outlines a prioritized agenda for action & investment. The Seychelles Investment Board (SIB), Seychelles' Conservation and Climate Adaptation Trust (SeyCCAT), Development Bank of Seychelles (DBS) and various other national and international partners including World Bank and the Commonwealth are working to develop opportunities in order to achieve national blue economy ambitions.[103] Like terrestrial planning, **Marine Spatial Planning (MSP) is undertaken at the national level**. Priority 4 of the blue economy strategic roadmap involves finalisation of MSP by 2020 to help 'set the rules to apply for ocean-based development across the maritime sector'.[104] Currently 9 MPAs and 5 Locally Managed Marine Areas (LMMAs) cover 0.06% of Exclusive Economic Zones (EEZ) with a commitment to increase to 30% coverage under a debt for climate adaptation swap.[105]

Like Seychelles, **Mauritius has a national Blue Economy Roadmap and specific blue economy government entity, as well as a National Development Plan and Stakeholder National Ocean Council. National Government has been advancing MSP across key maritime sectors.[106]** There does not appear to be a significant role for local government in these planning processes, although the Environment Protection Act (2008) which addresses Integrated Coastal Zone Management (ICZM), makes provision for an ICZM Committee to ensure collaboration and information sharing amongst national government, parastatal bodies, private sector, NGOs and local authorities.[107]

Both Comoros and Madagascar currently lack strategic blue economy plans and marine spatial planning policy.[108] Despite an absence of marine planning and recent instability beyond local government level, there is still significant blue economy investment taking place in Madagascar including the planned port of Ehoala at Tolagnaro (Fort Dauphin) which represents a $260 million investment through a modern PPP, that includes the Malagasy government, the World Bank and the mining operator Rio Tinto Group.[109] On Comoros, the Port of Moroni is operated by the private company 'Bollore Ports' which is headquartered in France.[110]

Mainland WIO countries vary in Blue economy and MSP development. Tanzania and Mozambique are said to have limited blue economy and MSP development at present.

South Africa is one of the most advanced WIO countries in the development of blue economy strategy and framework.[111] Operation Phakisa was designed by the consulting firm McKinsey alongside the national government. Overall, it is reported that Phakisa planning involved more than 650 people from government, academia, industry and 'other groups'.[112] Still, while the South African Department of Environmental Affairs (DEA) is a lead department for the framework, it is noted that delivery areas are still under functional government departments, presenting the risk of neglect of environmental priorities, within siloed efforts.[113] The Local Government Sector Education and Training Authority (LGSETA) suggest that **'much of the implementation of Phakisa takes place at provincial level,** however, local municipalities are utilised in planning and implementation depending on the mandate at the provincial level.'[114] In Durban, eThekwini Municipality is described to be in a strategic partnership with national government and other strategic partners,[115] although the extent to which local government has been able to truly influence Phakisa investment locally requires further research.

MSP is one element of Phakisa, supported by a national MSP Act gazetted in May 2019. This legislation makes no mention of a municipalities but does state that coastal planning bodies should be consulted in MSP.[116] In Durban, coastal planning has been commonplace for decades. **The eThekwini municipality now has a number of Local Area Plans and Coastal Management Plans that inform and guide development along the coast.** Still, coastal planning is said to be currently a fragmented process in South African cities. This fragmentation is a result of a previous local government system whereby in the case of Durban, seven local government administrations managed different sections along the coast. In response, eThekwini Municipal Council has recently committed to a municipality wide Coastal Zone Management Strategy.[117] Municipal Coastal Committees have also been established in eThekwini and several other coastal districts to promote dialogue between governmental and non-governmental stakeholders and improve coordination of coastal management.[118]

In South Africa, policy directives (Coastal Management Programmes) exist at national, provincial levels and municipal levels, with alignment expected across the 3 scales.[119] The KwaZulu-Natal Province Coastal Management Programme states that **insufficient governance capacity, from national to municipal levels is having a cascading impact on the effectiveness and efficiency of coastal management institutions.** Training and capacity building are

therefore critical to the long-term implementation of coastal zone management.'[120]

In Kenya, development of the **Blue Economy Sector Plan, 2018 – 2022, part of the wider Kenya Vision 2030 was led by State Department for Fisheries, Aquaculture and the Blue Economy. Major flagship projects include development of a Blue Economy Master Plan and National Maritime Spatial Plan;** maritime education and training; development of legal, regulatory and institutional framework for Kenya's Blue Economy; revival of a Kenya National Shipping Line; and various activities focused on fisheries and aquaculture and maritime sectors. The sector plan states that projects and programmes 'will be implemented in close consultation and collaboration with county governments' and in line with the Constitution. County plans will be aligned and there will be 'capacity needs assessment' at national and county levels'.[128]

National government also held the country's first blue economy conference in 2018 which reaffirmed plans to develop a strategic framework akin to Phakisa and provided a list of 'bankable blue economy projects' at national and county level.[129] FDI is already an important driver of the blue economy in Kenya, including Chinese funding of Port at Lamu.[130]

OPERATION PHAKISA

South Africa's blue economy strategy was launched by former President Jacob Zuma in 2014. It aims to create 1 million maritime related jobs by 2033, contributing R177 billion to GDP.[121]

The strategy set out to target 9 priority sectors including 4 selected new growth areas.[122]. See table 2 below.

Examining success to date, Government has unlocked investments of ~R29.4 billion (US$ 1.7 billion) in the Oceans Economy and over 7000 jobs have been created across sectors.[124] 20 new marine protected areas (MPA's) have also been approved as part of Marine Protection and Ocean Governance workstream.[125] However, the 2015 ocean sector's contribution to national GDP (4.4%) did not improve on 2010 levels. This lack of improvement has been attributed to a depressed global and local economic climate; global trade growth and commodity prices under downward pressure; low oil prices; and a slowdown in investments especially from the private sector.[126] With the current COVID-19 pandemic, South Africa faces renewed challenges in meeting ambitious targets of Phakisa in the face of declining tourism earnings, wider economic insecurity and a fall in global commodity prices.[127]

Table 2 - Phakisa Priority Sectors

Sector	GDP, R bn		Jobs, 000	
	2010	2033 target	2010	2033 target
Maritime Transport and Manufacturing* **	16	42-61	15	40-56
Tourism **	15	25-35	90	150-225
Offshore Oil and Gas* **	4	11-17	0.4	0.8-1.2
Construction	8	20-21	162	390-407
Renewable Energy	0	14-17	0	0.9-1.1
Fisheries and Aquaculture* **	7	10-16	30	170-250
Communication	4	7-10	19	35-52
Desalination	0	0.1	0	1.6
Marine Protection & Ocean Governance* **	0	TBD	0	TBD
Total	54	129-177	316	788-1004

* New Growth Area

** The Phakisa website now refers to 6 priority workstreams adding Small harbour development. Renewable energy, desalination, communication, and construction do not feature, the latter presumably absorbed across other sectors. [123]

▸ Image: Local fishing community, Dar Es Salaam, Tanzania, © hecke61 / Shutterstock.com

Primary research in Kenya, revealed a sentiment across many interviewees that the **blue economy strategy needs to be brought down to the community level, beyond the boardrooms**, to communicate, jargon-free a holistic vision for the blue economy (beyond fishing which is often a common understanding) and work with local communities to develop implementable plans for inclusive blue economy benefits. It seems that county governments are a key stakeholder in the 2018-2022 sector plan, listed as one of the implementing agencies across flagship projects including blue economy masterplan and maritime spatial plan development, as well as there being a mayors side event at the 2018 conference. Perhaps there is a need for mechanisms which ensure community involvement in next steps at county levels.

MSPs are being created by coastal county governments in Kenya with support from actors including the World Wildlife Federation and the EU-funded Go Blue Programme, implemented through the regional economic bloc of coastal counties - Jumuiya ya Kaunti za Pwani (JKP).[k] **One issue which needs to be overcome is planning jurisdiction.** In Kenya, county jurisdiction stops at the high tide line, meaning that local authorities cannot plan into the sea.

Kenya has 6 MPAs and 24 LMMAs (~1% EEZ), including marine reserves off Mombasa and Malindi.[131] These MPAs are not only important to marine conservation but also provide valuable socio-economic benefits for the cities to which they are adjacent. The total number of annual visitors in Kenyan MPAs ranged from 70,000 to 160,000 from 1997 to 2010, with revenues generated from entry fees above US$1.5 million a year. The MPAs support close to 2,000 local boat operators who conduct tours and excursions.[132]

(k) JKP includes Kenyan Coastal County governments, certain national departments, universities, Kenya Ports Authority and other actors including UN and EU. Go Blue is focused on holistic blue economy advancement and intends to support implementation of Kenya's blue economy agenda outlined in Kenya Vision 2030 Medium Term Plan III (2018-22). The three core outcome areas of Go Blue are Sustained, inclusive and sustainable economic growth; effective and integrated maritime law enforcement; and an integrated approach to sea-land planning and management in coastal urban centres

3.3 JURISDICTION, CAPACITY AND COORDINATION

This chapter has highlighted how the influence of municipal authorities with respect to the blue economy differs considerably across WIO countries, linked to decentralisation and fiscal autonomy.

While national governments retain primary responsibility for blue economy planning in Seychelles and Mauritius, it is important that blue economy planning and investment is coordinated with local government, who are responsible for the provision of key municipal services which can support or undermine blue economy sectors, depending on delivery. On Comoros and Madagascar, local governments might offer a stable structure through which to promote blue economy. On Madagascar, the size of the island presents another argument for greater devolved powers. Still, in both cases, local governments need greater administrative and financial support.

On the mainland, blue economy governance is more complex, with an increased role for local governments but still significant influence from national government and FDI. This complexity, highlights the importance of holistic, coordinated blue economy planning across scales. Seychelles, Mauritius and South Africa have national strategic frameworks, Kenya has set the foundations for strategy development and the rest are yet to commence.

MSP is an important component of these blue economy strategic frameworks because it sets clear rules and limits that can help different blue economy sectors to co-exist. In Kenya, MSP is being implemented at local as well as national level, with counties building a marine element into terrestrial plans. This process needs legal validation.

MPAs and LMMAs are also important existing tools across WIO countries. City actors can work to promote sustainable blue economy activities in these protected areas. LMMAs enable local community to fully engage in the sustainable management and use of the marine environment. MPA and LMMA should be integrated into MSP and ICZM processes, which should themselves be coordinated. However, this is a challenge as the actors involved in these programs and processes are often different, with varying goals and motivations.[133, l]

A related challenge is alignment of blue economy strategies with existing environmental priorities and legislation. Examining Phakisa as an early regional example, highlights the importance of reducing siloes and promoting a holistic approach in which environmental considerations are given equal weighting to social and economic concerns. It is important that blue economy policies and frameworks are aligned with existing environmental legislation, and that strategic blue economy projects respect existing MPAs and MSPs. A related question is whether national projects, supported by FDI, can synchronise with sub-national objectives of different actors?

The UNEP Africa Blue Economy Handbook presents various recommendations in order to mainstream climate change and environmental stewardship considerations within regional and national blue economy approaches including 'incorporation of the use and effective implementation of Environmental Impact Assessments (EIAs) and Strategic Environment Assessments (SEAs) to mainstream and streamline climate and environmental considerations and the Blue Economy principles at policy, program, and project levels.' The handbook also highlights the importance of robust baseline data to support the sustainable use and conservation of marine ecosystems. Strengthened links between government, academia and community actors, with finance set allocated for robust, sustainable blue economy data collection mechanisms is also important.[135]

There is clear need for horizontal and vertical coordination across these different scales, tools and processes. There needs to be a mechanism to connect strategic conversations of national boardrooms with activities and wishes of local actors, for inclusive blue economy benefits. In mainland cities, local government appears to be the obvious conduit for this conversation. It is also important to build capacity amongst local community actors, both within LMMAs and more widely, to ensure that all actors can sufficiently engage in national blue economy planning processes. National blue economy strategy development could begin which detailed mapping of ocean stakeholders, plans and tools at different scales, ensure that existing protected areas continue to receive the protection that they warrant and ensure that all relevant stakeholders are involved in any national/local blue economy strategy development, with corresponding data sharing across stakeholders.

(l) In South Africa, the ICZM process itself, appears complex, with multiple levels of alignment required

BLUE ECONOMY GOVERNANCE - KEY ISSUES

ECONOMIC

SOCIAL

ENVIRONMENTAL

- **National planning capacity** – There is a need for WIO countries without blue economy strategies and MSP to progress in these respects but also an opportunity to learn from other countries further along in this process and follow best practices
- **Local fiscal capacity** – Can the stability of local governance structures on Madagascar and Comoros be provided with the capacity to develop and implement sustainable blue economy plans, coordinated with national government ambitions?
- **Local planning capacity** - Integrated city marine and terrestrial planning is a relatively new and evolving process in WIO cities. Planning authorities require enhanced capacity to implement integrated sea and land plans.
- **Data** across economic, social and environmental pillars and national to local scales, will lead to informed decision making and understanding of the impact of blue economy initiatives.
- **Local marine planning jurisdiction** – Local authorities with planning powers are typically only allowed to plan 2km out to sea. Blue economy activities for which certain local authorities have authority such as tourism and artisanal fishing, typically extend beyond this distance.
- **Coordination and integration of marine planning processes** - 1.Coordination between national vision, blue economy strategy, FDI projects and MSP. 2.Coordination between national and local marine planning and ICZM. 3. MPAs and LMMAs also need to be captured in national and local marine strategies and plans.
- **Bringing marine planning down to the local level** - Without appropriate levels of coordination and engagement, city and local level actors might potentially find themselves negatively affected by national blue economy projects or missing out on potential benefits.

▸ Image: Mombasa Marine Park © Peter Chadwick

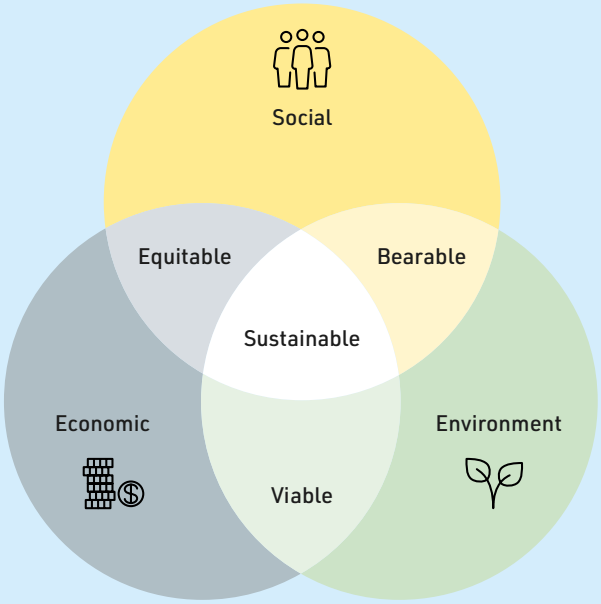
CHAPTER 4

ECONOMIC, SOCIAL AND ENVIRONMENTAL CHALLENGES AND OPPORTUNITIES OF THE BLUE ECONOMY IN COASTAL CITIES

The blue economy plays a significant role in coastal cities which experience multiple challenges and opportunities as a result. This chapter discusses 4 key sectors of the blue economy - maritime trade, tourism, fishing and waterfront development, through the lens of the three pillars of sustainability - economy, society and the environment. The wider operational environment in WIO cities is also analysed to identify its contribution to an effective blue economy.

THREE PILLARS OF SUSTAINABILITY

The Three Pillars of Sustainability presents a 'systems-based approach that seeks to understand the interactions which exist among environmental, social, and economic pillars in an effort to better understand the consequences of our actions. Ideally, research that seeks sustainable solutions to protect the environment also strengthens our communities and fosters prosperity'.[135]



While Chapter 2 examined the national importance of cities to the blue economy, **this chapter explores the importance of blue economy sectors to the cities themselves and the challenges and opportunities experienced** e.g. a blue economy sector may be of high economic importance nationally but how much of this money remains in and contributes to the city itself and who benefits? Table 2 overleaf provides a brief illustration of the kinds of positive and negative impacts of blue economy sectors on cities in advance of this detailed sector exploration.

Section 4.1. explores in depth, the relationship between WIO cities and blue economy sectors of Port and Maritime Trade, Tourism, Fishing and Aquaculture, and Waterfront Development. These sectors came through most strongly when exploring the blue economy at the city scale, across the WIO region. As this report is intended to be a status report, reporting the current situation, it is these sectors upon which the report has focused. However, the report also acknowledges the importance of other blue economy sectors such as energy (e.g. wind, oil and gas) and mining to governments nationally and the potential future impact of these sectors on WIO cities. The report also recognises other growing blue economy sectors including marine biotechnology and pharmaceuticals. Appendix 1 briefly discusses these sectors further.

After presenting specific blue economy sectors, **section 4.2 discusses the wider operational environment in WIO cities which is necessary for an effective blue economy**, examining waste management, transport infrastructure, education and skills development and climate change adaptation. Again, this section recognises the role of other infrastructure such as electricity, ICT and water in providing a supporting environment for the blue economy in WIO cities. It is not the intention of the report to be exhaustive in this sense, rather to provide a flavour of key challenges and opportunities with respect to the blue economy supporting urban environment.

Findings across Chapter 4 come from both primary and secondary research. Full case studies for Dar es Salaam, Kilifi, Mombasa and Port Louis are also available as standalone reports.

▸ Image on page 34: Lamu seascape, Kenya, © Jonathan Caramanus / Green Renaissance / WWFUK

TABLE 3 - ASSESSING THE IMPACT OF 'BLUE SECTORS' ON CITY ECONOMIES

		PORT AND MARITIME TRADE	TOURISM
POTENTIAL OPPORTUNITIES		• City and national tax revenue • Increased political leverage for city government, especially if the port is a gateway for goods entering country/region	• City and national tax revenue from tour • Bolster city and national reputation in international markets
		• Diverse employment opportunities for residents, including both high and low-skilled	• Increased employment opportunities fo skilled workers • Promotion of city's cultural heritage, in cross-cultural learning
		• Port developments under best practice 'Green Port' principles which mitigate environmental impacts.	• Scientific development and environmer protection from tourists taking part in c science and conservation activities
POTENTIAL COSTS		• Local government often not involved in port management so decisions bypass them	• Industry particularly vulnerable to shoc stresses e.g. terrorism, pandemic.
		• Expanded port facilities may cause community displacement. • Heightened congestion and air pollution from vehicle traffic	• Tourist dollar does not flow into local communities • Displacement of local communities fro expanded tourist activities, hotels or re uses of coastal lands
		• Impact of land reclamation, dredging, invasive species, petroleum leakage and liquid or solid waste from vessels • Collision risk for wildlife with vessels; • Noise disrupts wildlife breeding and feeding	• Direct ocean impact from development infrastructure along coast, including po mangrove destruction and harmful pra removal of corals. • Indirect impacts e.g. pressure from hig numbers on local services
INTERDEPENDENCIES		• Large footprints required for port operations limit waterfront area available for tourism & real estate • Port expansion and normal operations may harm fish or marine ecosystems, limiting productivity of fisheries	• Tourism may compete for use of limited space (on-shore and off-shore) with th industry • Eco-tourism relies on regular investme wealthier tourists to support jobs and e of local communities employed in the s

Economic Social Environmental

	FISHING AND AQUACULTURE	WATERFRONT DEVELOPMENT
ist activity.	• Fish markets could promote local produce rather than imported fish. • Value chain opportunities from fish processing	• Tax revenue for city and national government • Establish / improve city as destination for business activities and investment
or semi- creased	• Employment opportunities for residents, including those working in the informal economy • Food production for consumption	• Employment opportunities for semi/high-skilled workers in business admin. and service sectors • New recreational and retail amenities for city residents
ntal citizen	• Scientific research activities that help promote more sustainable fishing and aquaculture practices	• Nature-based solutions built into development designs to minimise habitat loss, restore marine ecosystems, enhance biodiversity
cks and	• Lack of vessels and equipment to fulfil economic potential	• Lack of land for opportunities to be realised
m creational	• Health and safety risks to fishermen given limited regulation	• Possible privatisation of public spaces reduces access to waterfront • High land costs for waterfront space may make retail & recreation services unaffordable to city residents
of tourist llution, ctices like h visitor	• Loss of ocean wildlife from overfishing and illegal fishing. • Habitat loss, pollution, and introduction of invasive species from intensive aquaculture practices	• Habitat loss and degradation due to land reclamation • Ecosystem degradation due to poor construction practices • Disturbance to coastal wildlife due to increased human activities
d coastal ne fishing nt from ducation ector	• Competition with tourism industry for limited space • Overfishing from unregulated fishing can reduce the health of fish or maritime ecosystems • Tourism opportunities from recreational fishing	• High interdependency with tourism as waterfront activities may increase city's appeal to tourists. • Nature-based solutions that increase biodiversity also enhance coastal defence, eco-tourism, health and wellbeing etc.

4.1. BLUE ECONOMY SECTORS

PORT AND MARITIME TRADE

The economic benefits of ports mostly accrue at the national rather than city scale while many of the costs are generally borne by the city. The social benefits – mostly in the form of employment - can be enormous and the largest employment sector in the city, though more policy effort and training are required to maximise employment opportunities. Any port expansion activity requires robust ESIA process and building of monitoring capacity for port pollution and illegal trade.

ECONOMIC

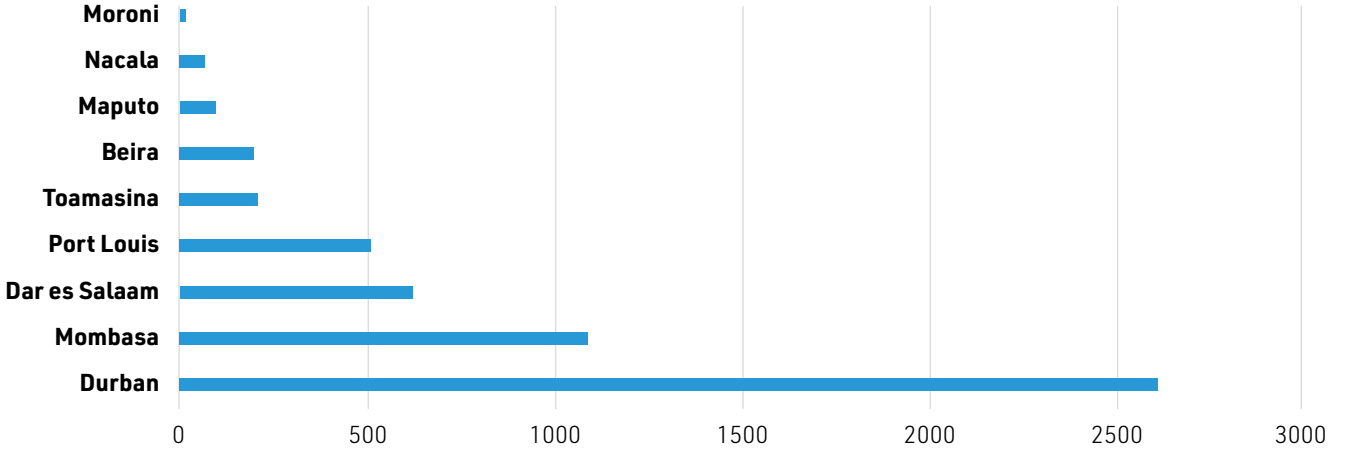
Ports provide vital connections for inland countries and form key parts of national economies, as discussed in Chapter 2. Dar es Salaam, Port Louis and Toamasina handle more than 90% of their countries' trade volume while Durban is the largest port in sub-Saharan Africa.

It is likely that a small number of dominant ports will eventually develop as regional hubs. Durban benefits from its location along global shipping routes connecting the east coasts of South and Central America to Australasia. As South Africa's main cargo and container port, it benefits from infrastructure that allows it to handle large numbers of cargo.[n] Durban has the largest amount of space in the region for container facilities (more than 1 million sq. metres), 4x that of other large WIO ports like Dar es Salaam and Mombasa.[136]

Still, growth in port demand is expected across the region. Total container demand in ports across East and Southern Africa is expected to begin exceeding capacity as early as 2025.[138] World Bank analysis identifies the need not only for port expansion but also landside access including intermodal transport and modern IT-based management systems. Greater private investment is seen as one way to achieve these needs.[139] The need for efficiency in port operations has even greater urgency in 2020, with operations disrupted by the COVID-19 pandemic[140] and ports recognised as a key part of national economic recovery. COVID-19 may hasten digitalisation of port activities, supporting social distancing.[141] Durban is already the pilot site for Transnet 'smart-port' development, using automation and technologies such as AI, big data, internet of things and blockchain to improve performance.[142] Such a transition would require corresponding training of port staff.

Chapter 4.2 discusses the **need to also develop and manage surrounding port infrastructure, particularly road networks.**

FIGURE 3 - MAIN PORT PER WIO COUNTRY IN TERMS OF TEU CONTAINER THROUGHPUT (000S), 2016 DATA



Ports of Durban, Mombasa, Dar es Salaam and Port Louis hold high regional significance [137]

New 'greenfield' ports, especially those located in secondary cities can also generate economic activity for cities, though their potential regional competitiveness is unclear. Estimates vary on whether new port facilities are likely to compete with established regional ports. For instance, the World Bank argues that 'once fully developed and operational, the new greenfield ports of Lamu and Bagamoyo are projected to capture 80% of the trans-shipment market from the ports of Mombasa and Dar es Salaam respectively.'[143] To the contrary, PwC suggests that 'greenfield ports are extremely expensive to construct and seldom emerge as real economic alternatives to long-established ports' and ultimately posit that Durban and Mombasa will remain as the major ports in southern and eastern Africa respectively.[144]

In several WIO countries, new investment opportunities involve the establishment of Special Economic Zones (SEZs) set up to utilise strategic port infrastructure and stimulate trade and investment. In South Africa, Durban's Dube TradePort and Richards Bay Industrial Zone are two SEZs intended to attract large scale private investment into the region from manufacturing and extractive industries.[145] Mozambique has established a centralised SEZ governing body, GAZEDA, which has been successful in attracting and coordinating investment for key infrastructure and economic development projects in SEZs, through special tax and custom arrangements in the region, most notably in Nacala, centered around the city port. GAZEDA has established partnerships between the private sector, international development organisations and central government agencies.[146,147]

FDI plays a critical role in WIO port development and expansion and can stimulate port-related economic growth. Some notable recent and upcoming investments in WIO ports, supported by external finance are outlined in Table 4.

However, the negotiated terms between investor and national government can have a long-term impact on the city-port relationship and need to be carefully negotiated. At time of writing tensions have been reported between the Tanzanian government and Beijing-based China Merchants Holdings International, over Chinese demands tied to development of the Port of Bagamoyo, including tax breaks, a 99-year lease and subsidies for water and electricity.[156,157]

TABLE 4 - RECENT AND UPCOMING INVESTMENTS IN WIO PORTS

DAR ES SALAAM	World Bank has approved $345m credit and $12m grant to the Dar es Salaam Maritime Gateway Project to increase capacity of the port to 25m tonnes 2017-24.[148]
MOMBASA	The second phase of a project to increase the container handling capacity of the port was supported by a $340m loan from the government of Japan (JICA) (Oct 2017).[149]
LAMU	The Port of Lamu was funded by the Kenyan State[150], but the contract for the first 3 berths ($478.9m) was fulfilled by China Communications Construction Company.[151]
NACALA	In 2019 Mitrelli group began construction of a bulk grain terminal in the port of Nacala. The total investment is estimated at US$200m.[152]
BEIRA	Ministry of Transport and Communications has announced plans for the construction of 3 terminals at Beira,[153] financed by port partners, Dutch company Cornelder Group.[154] Essar Ports has signed a 30-year agreement with the Government of Mozambique to develop a new coal terminal at Beira Port, as part of a PPP joint venture (Essar 70%: national port/rail company, CFM 30%). Phase 1 to attract investment ~US$275m
TOAMASINA	Planned investment of $1.0billion in a deep-water port project by the China Harbour Engineering Company (CHEC).[155]

(n) the length of berth available for container vessels in Durban is 2,576 metres in comparison to just 308 metres in Maputo

Major WIO ports are typically overseen by national authorities and city authorities usually have little input on decisions which affect the city and its residents for better or worse. Key questions for city authorities are how much of the money generated from local ports remains in the city and what role city government can play in port strategy and operations. Port revenue is collected by national government. In Mombasa, county government has been attempting to add local port levies and gain greater control over port management since devolution.[o] This move was opposed by shipping businesses fearing a reduction in port regional competitiveness.[158,159]

Perhaps the strongest evidence of engagement is in Durban and Beira, where municipalities interact with port authorities through respective forums, Transnet City Forum and Cornelder de Moçambique.[166] In 2010, eThekwini municipality and Transnet undertook joint masterplanning, aligning Transnet port expansion interests with the municipality's need to reduce congestion. Buffalo city municipality also signed an MoU with Transnet in 2019 to find ways to bring investment to the Port of East London and promote local economic growth.[167]

As Case Study box below explains, Mombasa has also been looking to reduce reliance on an economic sector which is largely outside of its control. Economic diversification is challenging where there is a huge reliance on the ports sector and such a process might take years of incremental planning. However, crises like COVID-19 might possibly in some respects provide an opportunity for investors and local government to accelerate certain decentralisation activities outside the main city centre. Such diversification would also require land, possibly changing certain land use zones to make provision for new economic zones not connected to the port. As chapter 3 explains, this land-use planning responsibility would fall to local government in mainland cities but national government on SIDs.

(o) In Mombasa stakeholder engagement takes place through Mombasa Port Community Charter, although the Mombasa municipality is not part of the charter.

(p) Program has a broad BE interpretation, proposing initiatives in seaweed farming, fishing, tourism, shipping, boat-building

CASE STUDY INSIGHT: THE PORT OF MOMBASA

The Port of Mombasa is key to the national economy of Kenya, handling a record 1,425,000 TEU last year, a 7.3% rise on 2018. Major investments and expansion of the port are ongoing.

The port is under control of central government and decisions are made on a national basis, not necessarily compatible with desired outcomes at the city level. This is typified by the recent creation of a dry port in Naivasha (near Nairobi) reducing the amount of cargo handling in Mombasa, particularly the use of the Standard Gauge Railway (SGR), rather than road to transport containers from the port.[160] In 2019, the county government of Mombasa commissioned the University of Nairobi to research the impact of freight train introduction on the local economy, finding that…

- More than 60% of employees (2,987) working at the Container Freight Stations (CFSs) were sacked over the year of the study.
- At time of the study, negative impact on county GDP said to be Ksh17.4billion, with businesses like fuel stations and lodges along the Northern Corridor also affected due to lack of patrons.
- Projections suggested the potential for county losses to reach Ksh33.3 Billion and 8,111 jobs in 2019[161] and some projections suggesting as many as 40,000 job losses longer-term.

The county government is exploring ways to be more involved in the management of the port, to be able to articulate their interests in matters relating to maritime transportation. Research by the University of Nairobi informs the county approach, which suggests that the county should consider investing in capacity building of key personnel who could contribute to running the port of Mombasa.

Not all impacts of the port are negative. While the dry port takes business away from Mombasa, it also removes congestion from the port area of the city, thereby reducing air pollution, with increased efficiency in container transport also likely to attract further future investment.[162] The SGR also has wider benefits such as increased domestic tourism.[163] For the city the port question can be viewed as a resilience issue and the county government has identified a need to diversify and not be too reliant on one asset under national control. There has been recent and ongoing investment in Dongo Kundu SEZ at Likoni supported by national government and another industrial park planned at Miritini with TradeMark which should go some way to softening the economic impact of recent port decisions.[164,165] The County government has also developed a new economic stimulus program in response to SGR losses, with the blue economy at the forefront of plans now seeking partner support.[p]

▸ Image: Lamu, Kenya © Byelikova Oksana, Adobe

SOCIAL

Ports support livelihoods for local residents through direct and indirect employment. For example, the OECD estimates that in the European Union, for every direct job the shipping industry creates, another 2.8 are created elsewhere in the EU economy.[168] Sometimes port-related employment may be based in other locations nationwide but in many cases a significant amount of direct employment and indirect employment and value-addition services can be located in the port city itself. For example, in Durban, the port employs 53,000 people directly, with ancillary employment estimated at 50,000, totalling 10% of the city's workforce. While in Toamasina, port employment represents approximately 35% of total employment in the city (the country's second largest).[169] Port development often creates new livelihoods. For example, over five thousand jobs have been created since construction began on the LAPSSET project in 2012,[170] whilst the Dube Trade Port SEZ has initiated the establishment of 12,000 new job opportunities.[171] Moreover, the SEZ at Nacala generated over 25,000 jobs in the region, 5,000 of which were in the formal sector in construction, engineering, manufacturing and agro-industry.[172] However, as illustrated in the adjacent case study of Mombasa, decisions on port operations are typically not made at city level and local livelihoods can be vulnerable to decisions made for national purposes. There is therefore a need for port cities to maximise direct and indirect employment and value addition opportunities from port activity.

Government sometimes make an explicit link between investment in port infrastructure and poverty alleviation. For instance, the South African government has outlined a series of investments for "first-world infrastructure" for Richards Bay-- through the Richards

Bay Industrial Development Zone. These are intended to boost investment and economic growth, with the goal of "development of skills and employment" for residents.[173]

A central challenge is ensuring that residents have the opportunities and skills to benefit from economic development around ports. In Lamu, the local workforce typically lack necessary skills to benefit from either the direct or indirect economic opportunities that the city's port-led growth is likely to provide. Direct opportunities typically require a level of education or technical skills beyond that of many local residents, while informal trade and business sectors currently lack capital and access to credit to expand and fully benefit from indirect opportunities associated with expected growth.[174] Similarly, firms operating in SEZs and IFZs in Mozambique report a shortage of skilled labour and low productivity levels.[175] Various policy mechanisms can be utilised in order to promote or require local participation in supply chains, including local content requirements; technology transfer promotion; and skills training with a focus on economically proximate activities in order to enhance the value-added locally to supply chains.

Where regulation and enforcement are lacking, ports may result in increased illicit trade. For example, in the Seychelles, 10% of working age population is addicted to heroin, which is smuggled easily at entry points within the 115 islands.[176] OECD note that illicit trade and activity can be especially pronounced in Free Trade Zones (FTZ), (often located at ports) where customs tend to be lighter. FTZs already exist in Seychelles,[177] Mombasa is set to establish an FTZ later in 2020,[178] and as already discussed, other classes of SEZ exist in cities across the WIO. OECD recommendations for FTZs include establishment of a robust FTZ legal framework which addresses inspection and operating checks, good data, international and domestic agency cooperation; and promotion of awareness amongst public and private FTZ stakeholders.[179] The International Chamber of Commerce highlight the need for a balance between incentivising economic growth and maintaining jurisdictional, border and customs controls.[180] In recent years Kenya has established a coastguard service, to secure territorial waters against smuggling and drug trafficking as well as illegal fishing (see fishing and aquaculture).

Construction of new ports or expansion of existing ports may threaten local communities. For example, large infrastructural plans for mainland Lamu, including the port and an oil pipeline, may threaten the 650-year-old Swahili culture and traditions on the adjacent island, a UNESCO World Heritage site.[181] Local residents have taken the Kenyan government to court, resulting in a compensation package of $8.8 million for 154 families whose lands were affected by the construction.[182] Kenya's National Land Commission also initiated a compensation scheme in 2014 under which dozens of landowners and fishermen received an average of $50,000 for their land and the expected loss of fishing ground. In Durban, there has been a longstanding community campaign against the Transnet proposed expansion of Durban Port by those seeking to prevent relocation of communities and disrupted agricultural livelihoods.[183] Robust international standards (especially International Finance Corporation (IFC) Performance Standard 5) exist to guide projects and can be calibrated to national legal frameworks which can help to de-risk project development and integrate affected communities into the development process.

ENVIRONMENTAL

In terms of carbon footprint, the transportation of goods by sea is far preferable to air, yet the negative impact of ports on cities are substantial and wide-ranging. Impacts include air, water, noise and sediment pollution, as well as habitat loss and wildlife disturbance.[184]

Air emissions resulting from port-induced city congestion has been highlighted in Dar es Salaam, Nacala, Beira, Maputo, Port Louis, Mombasa, Lamu and Durban.[185] All parts of the ocean receive atmospheric inputs that can alter biogeochemical processes. The emissions released by port and maritime trade activities contribute to these inputs. Indeed, recent scientific evidence has shown that iron particles, generated by cities and industry, are being dissolved by human-made air pollution within air particles. These particles once dissolved into the oceans, are potentially increasing the amount of greenhouse gases that the oceans can absorb.[186]

Port dredging - already undertaken in Port Louis, Mombasa and Cape Town - is necessary to allow ports to handle large ships but can disturb or destroy habitats. Sediment resuspension during the dredging process can also have local and regional polluting impacts within the water column. Port expansion via land reclamation has a significant negative impact on the marine and coastal environment. Land reclamation can lead to the permanent loss of large areas of marine and coastal habitats, including within river estuaries. Such is the scale of some expansion projects, that efforts to mitigate or offset the loss of these ecosystems can never be fully achieved. In Durban, where 70% of the Bay of Natal is industrialised,

assessments conducted by the municipality highlighted that port expansion has harmed water birds that depend on estuarine bays. Only 4% of the natural shoreline remains, along with just 14% of the original tidal flat area, and only 3% of mangrove habitat. Mass fish kills have also occurred due to water pollution and altered hydraulic dynamics associated with new harbour infrastructure.[187]

Water pollution challenges connected to ports and the shipping industry include petroleum pollution[188]; the leaching of paint chemicals, micro- and nano-plastics into local waters from ships that do not meet current standards; and a lack of ballast water[q] receptors leading to water deposited hundreds-thousands of miles away from its source. As well as releasing pollutants, vessels and port activities can introduce invasive species into the local habitat which in turn promote the spread of disease and impact native wildlife.[189] Enhanced port activities also increase the risk of ocean wildlife colliding with vessels and can alter migration, breeding and feeding behaviours of marine animals large and small, many of which are highly sensitive to noise and vibration.

There are opportunities to improve the environmental impacts of ports, and Durban has been a front-runner in promoting greener port policies such as Alternative Maritime Power (AMP) (otherwise known as 'cold ironing'), liquefied natural gas (LNG) 'bunkering', or prohibiting the handling of commodities that are extremely polluting for the environment.

AMP is an anti-pollution measure which reduce air pollution produced from diesel generators by using shore electric power as a substitute. The key advantage of LNG as a fuel is the vast reduction in pollutant caused by the more traditional ship fuelling methods involving heavy fuel oil, marine diesel fuel (MDO) and marine gas oil (MGO). The port of Durban is also the only port in the study that offers environmentally differentiated port dues for specific liquid bulk tankers. Other ports including Mombasa are beginning 'Green Port' projects addressing issues such as ensuring use of cleaner fuels in vessels and ancillary port vehicles.[r]

(q) Water added or deposited in order to keep a ship in balance
(r) In Mombasa's case with support of Trademark East Africa

PORTS – SUMMARY OF KEY ISSUES

ECONOMIC

- **City role in port activities** – Most WIO municipalities have little say in the operations of ports within their cities but at times national decisions can be counter to city aspirations. Higher capacity municipalities in South Africa present the clearest evidence of coordinated planning between port authority and city, for mutual socioeconomic gains
- **Capacity vs demand** – WIO ports need to expand to meet projected container demand over the coming decades including development of port infrastructure, landside transport and IT-based management systems. FDI/private investment is evidently key to the port expansion plans for most WIO countries but terms need to be favourable as emphasised by current stalling of Tanzania-China Bagamoyo port investment.

SOCIAL

- **Skills development** – Local populations need the training opportunities to be able to benefit from livelihood opportunities associated with port development.
- **Employment Multipliers** - Maximising indirect employment opportunities.
- **Tackling illicit trade** – such as drugs and smuggling especially through FTZs
- **Social Impact** - Managing socio-economic demands for port development with the needs of communities and culture which stand to be relocated and/or impacted.

ENVIRONMENTAL

- **Managing direct environmental impacts** – Port expansion requires dredging which can destroy habitats; increased port activity potentially leads to increase in associated environmental problems such as ballast water pollution and fuel leakage.
- **Managing indirect impacts** - Increase in port activity creates additional congestion in port cities. Associated air pollution contributes to ocean acidification.
- **Green port policies** - offer an opportunity to mitigate the above environmental issues.

TOURISM

At the city level, the economic benefits of tourism derive primarily from the classification of tourism as a tradable sector which attracts spending from outside the domestic city economy. Tourism is less environmentally resource-intensive than many other key blue economy sectors, reducing the environmental pressure on coastal and marine resources. However, economic opportunities and the need for infrastructure development in this sector must be balanced against the need to protect coastlines from development and marine habitat degradation. Efforts also need to ensure that income from tourist-related activities filter down to local communities, rather than solely benefiting international operators.

ECONOMIC

Across the region, coastal and marine tourism presents an opportunity for coastal cities to diversify the economy.[190] Coastal tourism contributes around 60% of overall national tourism earnings in Kenya, and is the primary draw for visitors to Mauritius, where 10% of all employment is tourism-related. Despite variation between countries, tourism–including both coastal and inland tourism–typically accounts for between 7.2% (Mozambique) of national GDP at the low end, and 12.3% (Madagascar) at the high end, and between 6% (Mozambique) and 10.3% (Madagascar) of total employment.[191] Mauritius and Seychelles are outliers, with tourism accounting for nearly 27% and 61% of national GDP respectively.[192] WIO countries have generally favoured the development of international tourism which often includes the development of coastal infrastructure.[193]

An opportunity exists for cities of the WIO region to develop a range of specific marine centred tourism industries to boost local economic growth. Some South African and East African ports have established trade for cruises and the Indian Ocean is emerging as a more popular cruise destination. **There is an opportunity for cities to take further advantage of this by promoting their region as a viable cruise stop destination**. This would generate consistent income from day tourists and docking fees.[194] Opportunities for SMMEs also exist

▸ Image: Funfair at Durban Beachfront

▸ Image: Blue and White Buildings Directive, Mombasa © Mwangi Kirubi, Flickr

in recreational tourism and whale and dolphin watching sectors, as evidenced in the success of several start-ups in Durban.

On WIO island cities coastal tourist spending is limited by both the number of tourists that visit main cities and the amount of time visitors spend in the city, with many bypassing urban areas and heading to more remote island beaches. 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 focused around beaches and water recreation outside Port Louis.[195] Similarly, relatively few tourist hotels on Seychelles are situated in Victoria and on Madagascar the most popular tourist beaches are on the small islands of Sainte Marie and Nosy Be. In recent years the government of Seychelles has boosted the tourism offering in the capital with annual 3 day carnival the 'Carnaval International de Victoria' starting in 2011.

A number of challenges may restrict the development of a strong, equitably beneficial, coastal tourism industry in the WIO. **Some of the less developed WIO states face macro-economic challenges and poor infrastructure which hinder their ability to develop coastal tourism**. Generally, other than backpackers and local tourists, consumer demand for quality and standards has resulted in the dominance of international hotel firms and tour operators in WIO coastal tourism.[196] On Comoros, basic infrastructure such as a strong transportation network is absent and the sector is further constrained by the lack of specialised tourism infrastructure, such as hotels[s]. Mombasa has undertaken city beautification efforts in recent years, including a public notice issued to residents in 2018 directing that all commercial buildings be painted white and blue, symbolizing the Indian Ocean. While, some residents complained of loss of identity through this uniform branding, many have praised the initiative for sprucing up the city.[197]

Further development of coastal infrastructure in the WIO region requires significant finance and the participation of the private sector and financial institutions. It is important that a compelling case can be made for such actors to invest in the WIO blue economy in a fashion which enables and empowers local tourist enterprises. As a result of the heterogenous nature of coastal tourism regionally (largely weighted towards SIDS), a cooperation culture is not yet established, and regional tourism actors are few and disparate. Instability of the region reportedly contributes to the creation of many tour operators and therefore many business associations.[198] While Mauritius sits at number 13 on the World Bank Ease of Doing Business Rankings, elsewhere only Kenya, South Africa and Seychelles sit within the top 100, at

(s) In 2019 President Assoumani sought to raise $4.6 billion to support tourism, in addition to agriculture, transport and energy

56, 84 and 100 respectively. However, it should also be noted that in countries such as Kenya, reforms in areas such as electricity access, credit access reforms and online tax payment have made matters easier in some respects.[199] There is a need to create policies and incentives with attract blue tourism investment and effective public-private partnerships. Incentives could be attached to criteria which requires clear social and environmental value and protection of the investment. There may also be the opportunity for better alignment of development aid with sustainable tourism activities, as well as promotion of other innovative financing mechanisms such as crowdfunding and blended finance.[200]

Across several countries, safety and security concerns have damaged the tourism industry. In Kenya, the activities of terrorist group al-Shabaab, including the Westgate mall attack in Nairobi in 2013, reduced the influx of tourists in the country. Although numbers have bounced back in some areas, the tourism industry has been severely damaged in Malindi, located near the al-Shabaab stronghold of Somalia. The coastal coordinator manager for Nature Kenya has underlined that 'Terrorism…killed tourism in Malindi. We had over 50 tourist hotels [in the area] and only about 10 of them are operating now'.[201] Now COVID-19 is impacting tourism trade across WIO cities. As of June 29th, 2020, Kenya had reported US$752 million loss in tourism revenue,[202] while Tanzania estimated a drop from 1,867,000 to 437,000 visitors for the year.[203]

SOCIAL

The tourism sector has the potential to support local communities in the form of new business ventures and employment opportunities. However, in some WIO coastal cities international guests often visit through all-inclusive packages offered by international operators and the majority of tourist spend does not trickle down to local communities (see Case Study Insights in this section). The comparative economic strength of international tourist operators has enabled them to 'govern the whole value chain', in most WIO cities, shutting out SMMEs and local suppliers who often find it difficult to access capital, market information and networks.[204] There is a need for both better business support for SMMEs and potential for a regulatory body to ensure that SMMEs and suppliers are not exploited by hotels and resorts. The same SMMEs must offer quality service and comply with environmental policies in tourism sectors of their countries. Such regulation could potentially be a coordinated effort across WIO countries.

In Mombasa, interviewees also noted the number and cost of licences for small businesses as a prohibitive factor. Larger, luxury hotels also often come with private beaches which can decrease public space access for local population. In some instances, demand for high-quality tourism has also resulted in inward migration of workers with higher levels of education and better language skills into coastal cities, as

▸ Image: Stone Town Zanzibar © Mariusltu, Adobe

observed in Zanzibar by UNICEF. The same study also highlights tourists exhibited values which conflicted with traditional lifestyle and beliefs, including visible alcohol consumption and dress styles.[205]

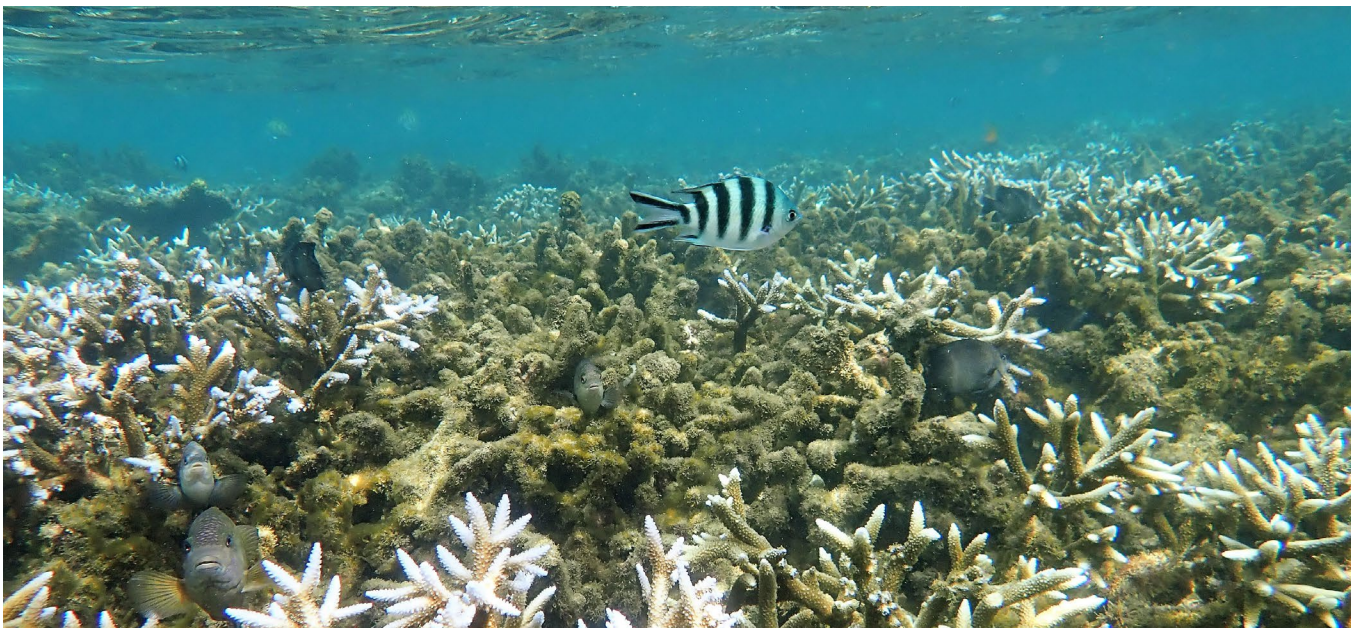
Despite challenges coastal tourism still offers significant opportunities for WIO communities:

Low-cost ('budget') international tourism and domestic and regional tourism sectors offer entry points for the establishment of locally owned and grown SMMEs. Research suggests that backpackers, who do not demand luxury, spend on locally produced goods and services with positive local economic multiplier impacts. In addition, facilities for backpackers are typically modest and therefore it is feasible for local entrepreneurs to gather the capital to purchase and operate them.[206] Conversely, high end or luxury tourism generates fewer tourists but higher spending rates which create larger secondary job multipliers and may be more appropriate in fragile eco-systems where mass tourism is to be avoided.

Coastal tourism provides opportunities for traditionally marginalised groups such as women and youths and those in declining industries. The sector enables development of new skills and opportunities to transition into more sustainable employment. Despite discussed challenges, the growth of a tourism industry around the Stone Town, Zanzibar has financially supported local community organisations and some visitors have developed charity organisations to support the urban area. In Lamu, Kenya, the county is partnering with the national government to access funding programmes which specifically support the establishment of SMMEs by women and young people.[207] On Comoros, FAO noted that some fishermen were previously trained in tourism activities such as boat excursions and whale watching but this was not recorded and they can no longer be identified. The FAO recommended updating of training registers and increasing training opportunities in roles such as guides, cooks and drivers.[208] Lastly, in both Mombasa and Victoria, Seychelles, authorities have recognised the need and opportunity for training and formalisation of local sellers that offer items to tourists at popular locations such as beaches and cruise terminals (see Case Study Insight below).[209]

Ecotourism is a growing sub-industry across WIO countries, with opportunities existing in or near cities as discussed in the following section. Local communities engaged in ecotourism can support themselves while protecting local habitat and sustaining the eco-tourism industry. The role of ecotourism is explored in further detail in the below Case Study Insight.

One negative social impact in several WIO cities is the increase in sex tourism, driven largely by European visitors. Beaches in Beira have been described as 'ideally situated for tourism but also for the sex trade' which has resulted in the municipal government launching HIV/AIDS awareness raising campaigns in partnership with CSOs.[210] In Malindi, Kenya, news agencies have highlighted the existence of an extensive child sex trade often involving Europeans, which exploits the poverty of many in the region.[211] As of August 2020, hotels in Kenyan coastal resorts like Malindi and Mombasa were beginning to reopen as COVID-19 restricted were lifted. However, hotels had been closed for 5 months, leaving many workers who are dependent on the industry without employment.



▸ Image: Corals, Mauritius © University of Mauritius

ENVIRONMENTAL

Tourism or 'eco-tourism' can help actively protect and enhance marine habitats. When operated sustainably tourism creates less resource-intensive streams of income than more extractive blue economy sectors such as oil and gas and mining and therefore reduces the environmental pressure on coastal resources.[212]

Marine Protection Areas are useful tools for protecting sensitive or valuable marine ecosystems. They can provide significant environmental benefits in the form of healthy marine ecosystems, whilst presenting new opportunities for tourism activities, particularly snorkelling, scuba and free diving. In Dar es Salaam, marine reserves cover nine uninhabited islands along the city's coastline. The reserves are protected from development and fishing in order to preserve important coral reefs and seagrass beds. Lessons from here and elsewhere in Tanzania suggest that effective management of MPAs requires close stakeholder collaboration and provides a source of income for local community members who may offer guiding or transport services to local and international tourists. Similarly, MPAs in Mombasa and Malindi protect ocean resources that make these areas popular tourist destinations for snorkelling and diving. Throughout the WIO region, opportunities may exist to expand the use and coverage of MPAs and to better integrate management of these areas with tourism and fishing sectors. Furthermore, a 2010 study conducted in Mombasa suggests that tourists may also be willing to pay a premium for marine tourism experiences if profits are shown to be re-invested in protection of the reefs they are visiting. However, it is important that such experiences are also accessible to local population and not just tourists and more affluent citizens.[213]

As discussed in Chapter 3, Locally Managed Marine Areas help communities to take ownership and benefit directly from the local marine environment. While these are typically in less urbanised areas, they are relevant to this discussion in the sense that **LMMAs mitigate some of the negative carbon intensive activities in cities and might offer an important tool for marine planning/governance in, or near to, small but rapidly growing urban areas**. (See adjacent Case Study). One recent feasibility study by the International Union for Conservation of Nature identified the potential of LMMAs as tool for sustainable governance in coastal cities of Mozambique.[214]

Eco-tourism can help supply research projects with citizen scientists, essentially tourists who are willing to pay for the experience of doing conservation work. Conservation tourism opportunities tend to be in towns and villages rather than WIO cities including sea turtle conservation in Watamu and coral reef monitoring in Blue Bay, Mauritius.[215] Still, opportunities may also exist in WIO cities, with marine reserves in adjacent waters to several WIO cities.

With tourism, there is a fine balance between the pursuit of economic opportunities and need to protect important coastal habitat, with development control not always favouring the latter. In 2014 in Malindi, a multi-million dollar Italian hotel investment in the region was given permission by the Kenyan government to encroach on the supposedly protected land of the Malindi Marine National Park despite local protests;[216] Mauritius lost around 30% of its mangroves between 1987 and 1994, partly from tourism developments;[217] and in the Seychelles, mangroves are cleared and sometimes drained for housing and hotels.[218] In South Africa, Mozambique, Seychelles, Mauritius, Comoros and Madagascar, land use and planning legislation do not deal directly with tourism that would support city administrations with environmental conservation.[219] Some hotels in several WIO cities such as Mombasa also lack on-site sewage treatment facilities, adding to wider urban terrestrial and marine pollution.[220] Other challenges include anchor damage and trampling from tourists, careless boating and diving, and breaking off of corals by tourists and those associated with the tourist retail trade to keep and sell as souvenirs.[221] Whilst the marine and coastal environments present an opportunity for tourism and eco-tourism, these ecosystems are sensitive and of rich biodiversity. Awareness raising and monitoring is needed to mitigate such negative impacts.[222]

The eThekwini Spatial Development Framework 2020-2021 emphasizes the need to **define the Coastal Management Line (CML)** as provided for in the South Africa Integrated Coastal Management Act and enforce associated land-use controls in order to control and manage risk in the coastal area. The framework highlights how EThekwini Municipality 'has experienced a major reduction in its natural asset base to the point that sustainability limits have been exceeded or are rapidly being approached for many environmental systems' and that current efforts to secure the remaining natural assets and environmental quality are failing at a municipal scale. The framework states that 'responses are required across the full suite of municipal mandates and will need to be underpinned by improved governance, both within the Municipality, and across spheres of government'.[223]

One final threat to the blue economy tourism sector is an increase in climate hazards. Many WIO city destinations are located at low altitude, with high temperature and humidity levels, all of which contribute to their vulnerability to climate change. Climate adaptation and resilience is discussed in Chapter 4.2.

▸ Image: Mangroves at Mida Creek, Kilifi, Kenya

CASE STUDY INSIGHTS: TOURISM IN MOMBASA AND KILIFI

Tourism is an important part of Mombasa's economy and according to Kenya Tourism Board, approximately 65% of tourists coming to Kenya visit the Coast. Despite this, the coastal tourism sector has faced significant challenges in the past decade, including two small-scale terrorist bomb blasts which hit Mombasa in 2014 and resulted in travel advisories being issued from major tourist countries including UK and USA. Even when those were lifted, a stigma was left, which the city and country have worked hard to tackle.[224] Luxury hotels along the coast are owned by foreign companies who offer tourists all-inclusive packages. One 2007 study sample suggested as many as 80% of international tourists to Mombasa were all-inclusive.[225]

In the past decade there has been a realisation by the national and county governments and associated actors such as the Kenya Coastal Tourism Association (KCTA), that Kenyan resorts cannot be so reliant on international tourists. The industry has diversified, offering favourable off-season rates to local tourists, more targeted domestic tourist packages and catering to the growing conference tourism market. The arrival of the SGR makes Mombasa an even more appealing domestic holiday location. Domestic tourists are thought to be more likely to spend time and money beyond the confines of the hotel.

National and county governments have undertaken other activities in recent years to address challenges to tourism, including ramping up national counterterrorism campaigns and advertising to reduce fears over safety; a cultural tourism day (with the closing of certain streets in Mombasa); local by-laws on façade paintings, and improvements to the airport road. KCTA has also provided training in recent years to 'beach boys' who occupy the public beaches, trying to persuade tourists to buy their offerings. KCTA has therefore provided training to 500 beach sellers, focusing on alternative styles of customer engagement, creation of new product offerings and estabslihsment of designated selling spaces.[226]

Efforts by tourism actors across will now need to be redoubled as coastal resorts now face a new challenge as COVID-19 affects the tourism sector globally, including the Kenyan coast.[227]

In northern Kilifi, ecotourism helps protect local marine habitats and support local communities. Mida Creek Youth Group was established several decades ago at a time when mangroves were being exploited in local community. With support from Portuguese NGO 'A Rocha', the creek area has now become a site of mangrove protection and planting and of high marine biodiversity, including rare birds which migrate annually. The site is popular amongst conservation tourists and students whose income helps to sustain the operation and contribute towards local communities.

Nationally, in Kenya there is a target to increase conservation areas from 7% to 10%. LMMAs can help to bridge this gap. Furthermore, the success of smaller-scale conservation activities in urban locations such as Kilifi Town suggest the potential for expansion and formalisation of certain activities, in or near urban areas as LMMA.[228]

TOURISM - SUMMARY OF KEY ISSUES	
ECONOMIC	• **Attracting coordinated investment into the region** – improving the investor climate and mechanisms for regional cooperation • **Managing external shocks** – such as terrorism and COVID-19 which affect visitor numbers, particularly international tourists. In Kenya, national and local government increased focus on domestic tourists through campaigns and holiday packages. • **Attracting beach-tourists to the city** – is a challenge in island cities like Port Louis • **Boosting and diversifying tourist offering in WIO cities** – Actions to date in certain WIO cities have included new activities (e.g. diving, sport fishing, watersports and whale watching), beautification of public buildings/spaces and training to tourist workers e.g. beach sellers. In some locations research suggested promoting cities as cruise stops.
SOCIAL	• **Distribution of tourist income** – Cities need to ensure that tourist spending in cities filters down to local communities rather than remaining in foreign owned, all-inclusive hotels. Domestic tourists appear more likely to explore beyond the confines of the hotel. • **Local business rates** – Cities need to find an appropriate balance between incentivising local business development and collecting own-source revenue through business taxes. • **Training of youth and disadvantaged groups** – e.g. ecotourism, skilled workers such as drivers, establishment of SMEs • **Tackling sex tourism** – which is reportedly largely driven by international visitors. • **Building worker resilience** - to industry shocks
ENVIRONMENTAL	• **Development Control** – Defining the coastal management line, protection of mangroves, strength of land-use planning and development control. • **Direct and indirect tourism driven pollution** – e.g. point source pollution from hotels and diffuse source pollution from increased visitors. • **Preventing damaging tourist activities** – e.g. careless boating and diving, habitat trampling and removal of corals by visitors. • **Ecotourism** - can help actively protect and enhance marine habitats. When operated sustainably tourism creates less resource-intensive streams of income than more extractive blue economy sectors. • **MPAs and LMMAs** - offer an opportunity for environmentally conscious tourism.

FISHING AND AQUACULTURE

Industrialised fish processing can be a significant economic benefit at the city scale. However, limited vessels and equipment restrict local fishermen in many WIO cities to shallow waters which are overfished. Larger deep-sea catches go to larger international vessels, often fishing illegally. A lack of processing, storage and sale facilities in many WIO cities also limit sector performance.

ECONOMIC

The concentration of populations within coastal cities provides an opportunity for development of an industrialised fish processing sector. In Africa, over 5million people were directly employed in fishing in 2016. Since developing its fishing port in 1997, Seychelles has become a hub of the international tuna industry, and Victoria is the location of one of the largest tuna canneries in the world, which is a central employer of locals and a key supporter of livelihoods.[229] Overall, tuna fishing now comprises 28% of the country's GDP and 92% of exports. The country has also grown its earnings annually from licensing fees paid by foreign vessels fishing in its territorial waters.[230] In Mozambique, the fishing industry has grown by 13.4% since the early 1990s. Mozambican companies and the Mozambican state have taken advantage of foreign investment and specialist knowledge (in particular from Japanese and Spanish companies) to grow the prawn sector and fishing ports, storage, boatyards and workshops are located in Maputo, Beira and Nacala and dominate the country's export market.[231]

Opportunities exist for countries to develop aquaculture and mariculture sectors to supplement traditional fisheries. In Tanzania, the government has supported investment in aquaculture training, with degree programmes at the University of Dar es Salaam.[232] The city is also home to the Tanzania Fisheries Research Institute (TAFRI) which carries out research in fisheries, aquaculture and mariculture, fish processing and quality.[233] Ultimately, the fisheries sector in Dar es Salaam exemplifies a successful 'maritime cluster'—a concentration of companies or organisations with complementary skills or resources—that has generated significant employment and provides a good example for other mainland centres.[234]

▸ Image: Fish is auctioned to potential customers at Kivukoni Market, Dar es Salaam

However, some cities struggle to benefit from the rich marine resources due to limited economic capacity and low-performance fishing vessels and equipment. Larger international commercial vessels take advantage of this, in many cases fishing illegally. Whilst the licenses of foreign trawlers to fish in Kenya's EEZ were cancelled by the president in 2017[235], Kenyan fishermen lack the capacity to take advantage of this opportunity, and commercially caught Chinese fish continue to be imported into the country, undercutting local fishermen, middlemen and traders.[236] There is also growing competition among WIO countries over marine resources. Though fisheries are technically governed by international and national laws, regulations and policies, they have been described by the Observer Research Foundation as 'largely ineffective'.[237]

Limited sites for fish cold storage and value addition activities are also said to be limiting the industry in Mombasa, Kilifi and in other WIO cities. This challenge appears even greater in Mozambique, where the electrical grid covers only 28 % of the population and NGOs are resorting to exploration of solar chillers to work around wider infrastructure challenges and help fishermen to preserve catches.[238] In Mombasa, stakeholders highlighted that creation of a large fish market could help to sell regional catches and also potentially be seen as a tourist asset.

SOCIAL

Limited capacity means that in many WIO cities local fishermen are limited to small catches in coastal waters. In Kenya, local fishermen in Kilifi, Mombasa and elsewhere along the coast, primarily operate from small, non-motorised boats which are limited to fishing within shallow waters.

Local fishermen and wholesalers struggle to compete with international operators. In Mombasa wholesalers 'have been crying foul, saying importers are selling tilapia from China directly to retailers at throwaway prices, depriving them of customers'.[239] Evidence collected from the Likoni fish market in Mombasa, found that 'imported mackerel and tilapia sell for as little as $2 a kilogram; while a kilogram of locally caught fish such as red snapper goes for $5.'[240] A similar, challenge is faced by subsistence fishermen in Durban, with the South Durban Community Environmental Alliance stating 'Japanese, Chinese and other international fishing trawlers are allowed by government to fish within our maritime coastline our oceans in the winter months when sardines and shad are in abundance. They deprive local subsistence fisher folk who are trying to eke out a livelihood.'[241]

The fisheries sector is characterised by social conflicts between different groups. Different forms of competition (direct and indirect) between international commercial fishing companies and local artisanal fishermen have already been evidenced but challenges also exist between international companies and national bodies, highlighted in the harbour of Lamu in May 2019, when national coastguards detained two Chinese vessels fishing illegally in Kenyan waters. The fishing industry is also at the centre of social disruption on a localised level in other parts of Kenya like Malindi where traditional artisanal fishermen have clashed with trawlers.[242] On a positive note, in Mombasa, the county government have allowed skilled fishermen from Pemba Tanzania to fish in local waters in exchange for sharing of their technical skills with local fishermen.

Institutional frameworks are in place to address the wider social challenges within the fisheries sector and support greater regional co-operation and support artisanal fisheries. Stakeholders should utilise the pre-existing mechanisms within the 'Fisheries Support Unit' programme established within the Indian Ocean Rim Association and the more regional WIO Sustainable Ecosystem Alliance in order to support an integrated approach to oceans governance. Within domestic contexts, an opportunity to strengthen regulatory structures (and ultimately address social and environmental challenges) is a coastguard system, a policy pursued by the Kenyan government in 2018.[243]

Increased security presence in WIO cities and urban areas can help sustain local fishing activity. In Kilifi, Kenya at the time of writing, Kenya Coastguard has just moved its headquarters from Mombasa to Kilifi Town, with a new base at Mnarani and new Ksh 60 million patrol boat. Interviews stated the importance of this move for increasing safety and security of local fishermen in terms of both lifesaving and policing of illegal fishing, piracy, trafficking and terrorist activity. Over the years, local fishermen have been leaving fishing for the relative security of BodaBoda taxi driver jobs or mariculture. While maritime security is discussed here with respect to fishing, the enhancement of coastguard capacity is also important for the prosperity of all other blue economy sectors across WIO cities.

The fisheries sector can also provide support to vulnerable groups in several ways. Firstly, as WIOMSA highlight, seasonal migration of fishermen along the east African coast, including towards the urban areas of Tanga and Dar es Salaam following fish movements, has supported livelihoods for generations, although it must be acknowledged that migrant fishers may conflict with local groups due to competition at

markets.[244] The fisheries sector also supports female livelihoods. About 30% of those directly employed on prawn farms in Madagascar are women who work in post-harvest operations or administration, whilst over half of the sea-cucumber farmers supported by Blue Ventures are women.[245] In Mombasa 'Mama Karanga' are women who buy and process fish for local markets from small-scale fishermen. They form a link to buyers, selling an affordable product for lower income residents.

Beach Management Units (BMU) are a key local structure in the fisheries sector including urban areas. A BMU is an organization of fisher folk including crew, boat owners, managers, charterers, fish processors, fish mongers, local gear makers, repairers and dealers within a fishing community.[246] BMUs offer an important link between the government and artisanal fishermen. BMUs allow the knowledge and understanding of all stakeholders to be reflected in the decision-making process. BMUs are typically central to the establishment of LMMAs and many LMMA members are current or former fishermen. LMMAs have been suggested as a solution to overexploitation and an ecosystem approach to fisheries management.[247]

ENVIRONMENTAL

Overfishing and its impacts on the marine environment is directly related to the social and economic challenges highlighted in previous sections. Small vessels are only suitable for fishing in shallow waters, equipment is often unsuitable and nearshore areas are therefore often overfished. In Maputo in 2019, fishermen rioted against Maputo authorities after their illegal fishing gear was confiscated.[248] Such problems are exacerbated by ineffective regulation and weak governance, which reduce the ability of the WIO region to cultivate sustainable development practices.[249]

Seaweed farming is widely regarded as the least damaging form of aquaculture for the environment and brings many benefits including increased biodiversity, local pH stabilization, reduced eutrophication, raised dissolved oxygen concentrations and wave energy attenuation. Due to the extensive environmental resources in the WIO region, opportunities exist for coastal city administrations to develop maricultural facilities. The leading example of this is seaweed culture in Tanzania (especially urbanised Zanzibar) where production and farming methods have grown substantially over the past two decades.[250] Nevertheless, the concept has not been adopted widely elsewhere, due to the insufficient resources available in these regions to support the highly complex process of establishment.[251]

In other parts of the region, aquaculture is big business, however, this has led to large scale land reclamation and, hence, habitat loss, along sections of coastline and river estuaries. Aquaculture is also responsible for increased pollution in coastal waters due to the frequent release of nutrients and chemicals used to maintain fish stocks into the natural ocean system, whilst fish food accelerates the spread of disease and non-native species invasions.

▸ Image: Small Scale Fishermen on shores of Dar es Salaam © Igor Groshev, Adobe

Fisheries are already being severely affected by marine pollution and illegal fishing, thus destabilising ecosystems and negatively affecting the population of various marine species. Climate change and urbanisation exacerbate these negative impacts and lead to further degradation of marine species. (Marine pollution is a challenge discussed further in 4.2.) Coastal erosion and inundation could cause loss of vital habitats such as mangroves, and in turn negatively affect the reproduction of species as many marine animals use these habitats to breed and protect their young. In the urban centres of Kenya, WIOMSA has observed 'over-exploitation of nearshore fisheries' and ultimately the 'degradation of mangrove areas and major shoreline changes'.[252] Ocean acidification and rising sea temperatures cause mass bleaching events that can destroy large scale coral reefs critical to a multitude of marine species.[253]

Like for tourism, LMMAs and MPAs are important mechanisms for sustainable fishing. When coupled with scientific research and nature conservation practices, fishing has the potential to have positive benefits in the region.

CASE STUDY INSIGHTS: DAR ES SALAAM AND PORT LOUIS

Dar es Salaam and Port Louis present contrasting versions of the fishing sector, but with similar challenges from environmental degradation due to overfishing and climate change.

Dar es Salaam is the centre of the fishing industry of mainland Tanzania. The sector employs fishermen, processors, owners of fishing boats and equipment, auctioneers and vendors Yet, despite the abundance of pelagic species in the marine waters off Tanzania, the sector remains artisanal with most boats operating with crews numbering just 1-20 fishermen. Some medium size boats have a crew-capacity of forty, although 'very few' boats operate on a commercial scale according to government.[254]

The city's fish processing capacity remains small. Fish processing in Dar es Salaam is dominated by the private sector, which has taken advantage of the limited fish processing facilities available adjacent to the landing sites and adjoined markets. Large companies buy fish in bulk at the market for processing at their industrial plants and eventual transportation to consumers from as far afield as Kenya. Still, most fish processing is done by individuals—for instance, frying catch before it is transported and sold locally.

Unlike Dar es Salaam, the fishing industry in Port Louis is focused on medium and large-scale industrial fishing. Artisanal fishing dominates throughout the rest of the island, but Port Louis' primary role in the fisheries value chain is as a processor and exporter of fish, rather than in fish capture. The port's fish handling and processing facilities are well-known in the WIO region, and 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 keep pace with international best practice. The industry employs residents in and around Port Louis, including fisherman as well as an even larger number of workers involved in fish processing. It also supports businesses specialising in repair and supply of fishing vessels and equipment.[255]

Environmental concerns around fishing are front-of-mind in both cities. Despite successful steps by government to tackle dynamite fishing in the waters off coastal Dar es Salaam, including through the establishment of constant Special Unit patrols drag net fishing remains an urgent problem in the region, with accidental entanglement of endangered species. Although regulations exist detailing what equipment is allowed at different depths, enforcement remains difficult due to resource shortages within municipal council fishing departments and the Marine Parks and Reserves Unit. Poaching is prevalent especially with sea turtles and their eggs which are delicacies for local communities. Illegal fishing around the coral reefs have the potential to harm reef ecosystems.

Degradation of the coral reef is also a concern in Mauritius, although this is a problem located mainly beyond the city, caused by artisanal fishing in the reefs. Like Tanzania, Government of Mauritius has implemented successful efforts to regulate artisanal fishing to protect at-risk marine ecosystems, with a focus on the increased engagement of coastal communities to monitor and protect fish populations. Of greater concern to the fishing industry in Port Louis are the impacts of off-shore overfishing on species of tuna, as well as potential changes to fish migration and reproduction habits due to warming waters induced by climate change.

FISHING AND AQUACULTURE – SUMMARY OF KEY ISSUES	
 ECONOMIC	• **Building capacity** - Poor equipment including vessels and ancillary equipment reduces the potential of the fishing sector across several WIO countries and cities. • **Limited processing and storage facilities** - is another prohibitive factor in WIO cities meaning that much fish stock is wasted or little value added • **Security** - Larger international commercial vessels take advantage of poor local capacity, in many cases fishing illegally. Enhanced coastguard capacity is necessary • **Maritime clusters** – of companies with complementary skills or resources can generate significant employment as discussed in the case of Dar es Salaam. • **Aquaculture and mariculture** – present opportunities beyond traditional fisheries
 SOCIAL	• **Building local capacity** - Local fishermen are limited to nearby waters and therefore small catches. • **BMUs** - Local community groups exist in most WIO cities. Supporting these groups can increase local livelihood potential and more sustainable management of coastal waters. • **Female Livelihoods** - Fsheries sector potential to support female livelihoods. E.g. prawn and sea cucumber farms in Madagascar, Mama Karanga in Mombasa.
 ENVIRONMENTAL	• **Balancing economic and environmental priorities** – from a financial perspective there is a need to boost fishing capacity in several WIO countries but how can economic ambitions be balanced with sustainable fish stocks and marine conservation? • **Overfishing** – as small vessels are only suitable for fishing in shallow waters. Unsustainable practices in deeper waters including illegal fishing • **Pollution** – both point and diffuse sources affects marine species • **Seaweed farming** – is widely regarded as the least damaging form of aquaculture • **LMMAs and MPAs** - are important tools that support sustainable fishing.

WATERFRONT DEVELOPMENT

Waterfront development can increase employment and tax revenue from land uses and increased land value. However, these sites are frequently of historical and cultural significance which must be balanced with economic opportunity to ensure inclusive access to amenities and recreational facilities for city residents. The environmental fragility of waterfront sites is both an ecological concern and an economic one, as the cost of coastal protection can be significant.

ECONOMIC

Economic benefits related to waterfront development include increases in employment and tax revenue from land uses and increased land value. For example, recent development in Port Louis has concentrated around the waterfront, which includes business facilities and conference venues, and touristic/ recreational amenities such as restaurants, hotels and cultural activities. The combination of high-end hospitality and retail along the water generates employment and revenue for Port Louis, supporting the city's business tourism sector and providing high-end retail to residents.

As urban growth in many coastal cities concentrates along urban and peri-urban edges, a key challenge will be to ensure adequate funding is allocated to ensure that waterfront areas and city centres are maintained. The ability for eThekwini municipality, Durban to act independently of national government to take advantage of the opportunities of the blue economy is highlighted by their initiation of the uShaka Marine World, which includes the facilities of the Oceanographic Research Institute, as a major node of development in the city both in terms of tourism and marine research (see Case Study p58).[256]

Another challenge to waterfront development includes risk from storm surge and sea-level rise, and the threat of coastal flooding. In Port Louis, many of the city's most valuable properties, including Le Caudan waterfront lie along the shoreline. According to the World Bank, "annually, there is a 1% chance of losses exceeding US$1.9 billion, (16 % of Mauritius' GDP)."[257]

SOCIAL

Waterfront neighbourhoods are often the oldest settlements in a city and frequently of significant historic, cultural and architectural value. For instance, Stone Town in Zanzibar was designated a UNESCO World Heritage Site in 2000 and in 1997 Mombasa's Old Town was submitted by the National Museums of Kenya

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

for selection in UNESCO's list of World Heritage Sites. Port Louis' only World Heritage site, Aapravasi Ghat, is located along the waterfront. In Dar es Salaam, many buildings of architectural importance are located in and around Kisutu along the waterfront.

Waterfront spaces are also often key sites of community interaction and are important to public realm. Such spaces include public beaches, parks and specific waterfront development. In Mombasa, the Mama Ngina Waterfront, which was completed in 2019, includes a park that stretches for 2km along the south of Mombasa central Island, with sites for food culture and for traders who previously were previously sited informally, as well as integrating existing historical architecture and Baobab trees. Durban's beachfront Golden Mile is a mix of beach, promenade and leisure attractions including theme parks and waterslides. The affordability and accessibility of the space and its attractions have led it to be known as one of South Africa's most inclusive spaces.[258] Successful waterfront redevelopment contains an element of public space that attracts people to spend time by the water. If you mix this with high-end residential and commercial property you can ensure the economic sustainability of the project. And if you add in cultural activities and retail, you get the perfect mix to ensure healthy development.[259]

ENVIRONMENTAL

In some cases, rapid urbanization has resulted in urban expansion along coastlines and waterfront development along greenfield sites, with negative environmental impacts from building and using lands with limited or no previous development, often without appropriate zoning and setbacks. Land reclamation has caused major habitat loss across the region.[260] Increased numbers of people living and working along the coast also have increased the amount of disturbance to wildlife in these areas. However, as many cities expand inland rather than along the coastline, waterfront development often entails replacing or upgrading existing land uses (rather than greenfield development), with comparatively lesser environmental impacts as evidenced in projects such as the Victoria and Alfred Waterfront Project in Cape Town.[261] Still, such regeneration projects should still be conducted following environmental impact assessments to mitigate unintended impacts.

In some places, opportunities exist to increase biodiversity along waterfronts that in turn will also help reduce exposure to sea-level rise, reduce flooding, provide health and wellbeing benefits, attract tourists and in general boost coastal aesthetics and local economies. As a result, the application of nature-based solutions has the potential to grow in the region. Such solutions range from modifying existing infrastructure, by designing opportunities for wildlife to colonise coastal structures, to restoring or creating whole habitats such as mangroves or coral reefs that, as well as enhancing biodiversity, can also help improve coastal resilience by reducing the risk of impacts from natural hazards and improving the property value of adjacent land. For example, an intact mangrove forest along the coast of Mozambique could reduce surge inundation area by 24%.[262]

A significant challenge to eco-parks and green waterfronts is that positive benefits are typically only seen after a long time, when sites have reached maturity and time has allowed social, environmental and economic (disaster risk reduction benefits) to be appreciated. Advocacy work is important, to highlight the long-term economic benefits of mangroves to property developers (and other investment actors) who might otherwise remove existing mangroves and/or have little appetite for green infrastructure within their projects. Education can explain how green infrastructure can provide flood protection to existing infrastructure held by investors, educate developers on how to minimize mangrove disruption from their projects, and promote opportunities for mixed use development, whereby mangroves and other green space become an important asset within a wider sustainable development. This advocacy work will not work in isolation and needs to be combined with legislation and policy with protects and promotes green infrastructure.

Certain coastal developments provide an opportunity to rehabilitate degraded spaces. Not strictly waterfront, but 200m from the shoreline, Haller park, owned by Bamburi Cement, is part limestone quarry, part eco-park and site of rich biodiversity in Mombasa. Limestone mining began in 1954 and by 1971 the area had become a visual eyesore and site of environmental hazard including brackish water, mosquitos and open dumping. Understanding the health risks of the site, the company began restoring the landscape. The park opened in 1985 and to date has rehabilitated about 325ha of the 566ha site, introducing more than 400 indigenous plant species, 34 species of mammals and 180 species of birds.[263] Mining activity continues but in a cyclic process where industry and nature co-exist. The welcomes over 100,000 visitors annually and plays several important roles with respect to the marine environment including bio filtering of effluents from nearby built-up residential land; timber harvesting from the reclaimed wasteland eases the pressure on local mangrove forests; creating an extra carbon sink; and habitat for certain animals that are part of the marine ecosystem.

CASE STUDY INSIGHTS: DURBAN AQUARIUM (USHAKA, SEAWORLD)

Durban Aquarium was first opened in 1959, driven by a newly established NGO the South African Association for Marine Biological Research, (SAAMBR) and supported by the city council of Durban (who provided necessary land and significant financial support). SAAMBR provide valuable research related to marine conservation and food security, and the aquarium was established so that profits could fund SAAMBR's research activities. For the city council, the development of an aquarium was one way to improve tourist numbers, at a time when a series of shark attacks had impacted visitor numbers.[264]

Over the years, this multistakeholder partnership has developed, with involvement of KwaZuNatal province in the project. Additionally, an MoU was established between SAAMBR and the Universty of Natal, initially only concerning training of PhD students at SAAMBR's Oceanographic Research Institute but in time also providing some additional funding to SAAMBR through research publications.[265]

The governance of SAAMBR includes a Council which has at least one representative from municipal and provincial government.

The most significant development was in the year 2000, when SAAMBR convinced eThekwini municipality to invest in a new complex, uShaka Marine World.[266] This site opened in 2004, replacing the previous ageing facilities. uShaka Marine World covers 16 hectares[267], including a water park, beach and most importantly an aquarium, with high-end scientific facilities.

Due to the scale of city investment, a deal was reached whereby eThekwini became the major shareholder of a new company DMTPC (Durban Marine Theme Park Company) and SAAMBR retained its independence and NGO status, and responsibility for aquarium operations, financed by grant funding.

Benefits of SAAMBR-city collaboration:

- SAAMBR has been able to exist as an effective research NGO despite high costs of research.
- Durban's marine and coastal zone of about 100km includes several ecosystems, has enjoyed decades of first-class marine science research, which has documented scientific information on biodiversity and marine resources.
- Durban has been able to call on SAAMBR to conduct unbiased scientific studies, supporting a positive image for the city.
- A positive academic output whereby most of the students are Durban based.
- The UShaka aquarium has become the #1 tourist attraction in the greater Durban region.[268]

▸ Image: Sea World uShaka Marine World © Flickr

WATERFRONT DEVELOPMENT - SUMMARY OF KEY ISSUES	
 ECONOMIC	• **Employment and tax revenue** - from land uses and increased land value related to waterfront development, as well as tourist income can offer municipalities important sources of income • **Operational costs** – need to be managed to ensure adequate funding for maintenance of waterfront areas • **Storm surge and sea-level rise** - pose an economic risk to waterfront developments
 SOCIAL	• **Historic, cultural and architectural value** - waterfront neighbourhoods are often the oldest settlements in a city of significant heritage value • **Public realm** - waterfront spaces can be key sites of community interaction and social cohesion • **Mixed use** - successful waterfront redevelopment often contain public space mixed with high-end residential and commercial property for economic sustainability.
 ENVIRONMENTAL	• **Waterfront development along greenfield sites** – typically in rapid urbanized/ urbanizing cities can have negative environmental impacts • **Natural/Greenified waterfronts** - In some places, opportunities exist to increase biodiversity along waterfronts that in turn will also help reduce exposure to sea-level rise, reduce flooding, and provide economic, health and wellbeing benefits. • **Rehabilitated spaces** - certain coastal developments provide an opportunity to rehabilitate degraded spaces. • **Scientific research** – combining tourist attractions with marine research through aquariums, nature reserves etc.
	• **Coordinated planning and implementation** - mechanisms such as planning committees and management committees manage the interests of different stakeholders and uses of waterfront space

4.2. OPERATIONAL ENVIRONMENT FOR THE BLUE ECONOMY

This section discusses cross-cutting urban issues which impact multiple blue economy sectors. The potential benefits of investment in blue economy sectors may be constrained by an inadequate operational environment. Whereas, an improved operational environment also offers considerable co-benefits to cities and their inhabitants. Amongst other things, a functioning blue economy in WIO cities requires:

1. **Waste management** as part of a healthy coastal and marine environment that supports blue economy sectors which are dependent on the ecological functions of the sea such as fishing and tourism;
2. **Robust transport infrastructure** as part of a broad network of urban and regional logistical infrastructure including energy and communications which support the logistics of all blue economy sectors;
3. **Education and training opportunities for citizens to engage in the blue economy**, creating a healthy, motivated, skilled workforce across blue economy sectors.
4. **Resilient planning and governance to manage rapid urban growth and climate change** pressures.

However, as discussed in Chapter 2, WIO Coastal cities are experiencing rapid and increasing urban growth which puts additional pressure on critical infrastructure, can cause environmental and social harm and impact the enabling environment necessary for a functioning blue economy.

▸ Image: Dar es Salaam © Moiz, Adobe

WASTE MANAGEMENT

Several blue economy sectors depend on healthy marine waters. Urban growth without corresponding development of water, sanitation and solid waste management infrastructure, and pollution control from industry can have significant negative environmental consequences.

Ocean pollution has the potential to impact both fish catches and quality as well as impact on other blue economy sectors including coastal tourism. Sewage systems across many WIO cities lack capacity and require upgrading to reduce pumping of raw urban sewage into WIO waters. For example, the sewage system in Mombasa was largely built in the 1950s and designed to serve a far lower population than that of present day. More than 70% of the population is not connected to a sewer network and most buildings use pit latrines, or septic tanks connected to soak pits if planned. Sewage challenges are in part linked to the issue of rapid growth and informality. Mombasa has approximately doubled in population over the past 20 years,[269] with 65% of the population living in informal settlements.[270] In Nacala. wastewater is routed through a treatment plant, but the mixing of industrial and domestic waste renders the waste-water treatment ineffective.[271] Studies have suggested higher trophic levels in samples taken at various coastal water sites around Mombasa.[272] While South Africa does generally have modern treatment plants, in Durban, plant faults in 2019 resulted in a temporary ban on diving, impacting both the environment and local business.[273]

Industrial pollution is another issue for WIO coastal waters, with effluents appearing to primarily be Biochemical oxygen-consuming organic materials (BOD) from agro-industries. 2010 data noted agricultural-related pollution as a primary source of industrial pollution into oceans on Comoros, Mauritius and Seychelles, while pollutants into the ocean off Mozambique came from 137 industries around Maputo, Matola and Beira including textile, paper, tyre and brewery.[274] More recently, eThekwini municipality notes how Durban experiences poor water quality at certain beaches due to organic and chemical pollutants carried down by the rivers and discharged into the ocean.[275]

Solid waste management is another major infrastructure challenge in WIO cities impacting the marine environment. Globally, it is estimated that approximately 80% of marine debris originates from land-based activities. Solid waste management issues include direct plastic pollution into the ocean, and leaching from poorly managed dumpsites. In Nacala, while the urban core sees nearly 100% waste collection, coverage drops to ~35% in peri-urban areas.[276] In Port Louis, solid waste issues are attributed to both shortage of staff and negative habits such as littering.[277] In Mombasa, Kibarani dumpsite was recently relocated as studies highlighted that waste was leaching into the nearby creek, damaging mangroves, affecting water quality and marine life.[278]

The same infrastructure challenges are being realised in smaller towns, which will grow to become larger urban areas in the coming decades, creating significant cumulative impact. At present, a very small proportion of the population of coastal towns and cities in the WIO region have sewage systems.[279] In places like Lamu where blue economy projects will stimulate growth, future-proof infrastructure planning is even more pertinent. (See also Kilifi case study report.)

▸ Image: Plastic waste, unidentified beach © Erlo Brown, Shutterstock

TRANSPORT

Blue economy sectors depend on transport infrastructure as part of a broad network of urban and regional logistical infrastructure including energy and communications.

Regional transportation planning has been highlighted as a key area for future improvement of WIO port operations. The 2010 Port Management Association of Eastern and Southern Africa Conference stressed that the networking of the ports to the hinterland was key to development and improvement of living standards in the region.[280] The Programme for Infrastructure Development in Africa[t] was established to accelerate the implementation of selected infrastructure projects by 2020, with US$75 billion needed to be spent on transport projects between 2012 and 2020, including rail, road and seaports.[281]

Opportunities exist to simultaneously develop or improve ports and rail connections. In Mozambique, railway corridors have been established stretching from the port cities of Beira and Nacala to the coal producing city of Tete. The mining company Vale has reportedly invested US$4.4 billion in rail and port infrastructure in the Nacala corridor.[282]

Transportation also needs to be improved within WIO coastal cities. Congestion results from both limited or insufficient infrastructure capacity, and poor management of existing transportation infrastructure. In a 2018 PWC study, 67% of port and terminal operators interviewed in Southern Africa, strongly agree that the road network around their port is not suitable to sustain port volumes.[283] For example, Dar es Salaam's form, poor transport infrastructure and vehicle growth is said to make mobility a growing challenge, affecting the region's competitiveness. City road density is at 0.84 km/km^2, where 5km would be more appropriate. The network cannot handle a current estimated 180,000 cars and 515,000 are projected by 2030. Increasing port volumes will also add to that challenge.

The infrastructure of the Comoros is weak and limits the potential for creating a corridor centred on Moroni.[284] In Mauritius heavy urban congestion has led to ten major projects being implemented under the Road Decongestion Programme as well as a new Metro Express Project - a 26km light rail transit system[u] passing through Port Louis.[285] Moroni experiences significant problems with road capacity and congestion. Only one road allows connection between Itsandra to the north of the city and Iconi to the south.[286]

In Mombasa, the Likoni ferry crossing to the southern mainland is reported to be increasingly unreliable. A faulty ramp caused two fatalities last year which was widely reported. Several road upgrades are planned and one ongoing project is the Dongo Kundu bypass to the west of Mombasa, which will ease the pressure on Likoni ferry and provide important supporting infrastructure for the upcoming SEZ[287]. Mombasa airport is key to the local tourism sector.[288]

Elsewhere in Maputo, Mozambique, Chinese constructors completed a bridge improving connectivity between the city and Southern Mozambique and improving access for tourists from South Africa. This installation reportedly contributed to a doubling of tourism income in 2019 in certain city districts,[289] although locals have complained about

▸ Image: Maputo Bridge © Nooaon photo, Shutterstock

the $3 charge to cross the bridge, alongside broader concerns about national debt from this and other projects.[290]

Beyond infrastructure development and expansion, proposed solutions to port traffic congestion include better traffic planning and rule enforcement – e.g. giving priority to freight vehicles on certain roads and times of day.[291] Such an action would also reduce air pollution at certain times.

EDUCATION AND TRAINING

Necessary skills and education are needed in order for local communities to benefit in each of the four blue economy sectors discussed in section 4.1 but also for broader national development gains to be achieved. Education needs to be an integral part of blue economy planning and implementation.

To date, the progress in creating maritime education and employment opportunities in WIO countries and cities has been mixed. In South Africa, 2019, direct job creation has fallen well-short of Phakisa's 77,000 target, currently standing at less than 10,000. The head of operations from the Phakisa Department of Planning, Monitoring and Evaluation highlighted the need for improved skills development, while speaking at the South African International Maritime Institute (SAIMI) conference, 'Forward Thinking for Maritime Education and Training Excellence'. This conference, introduced the Oceans Economy Skills Development Assessment for South Africa study, conducted by SAIMI. A key finding was that **'post-school education institutions are producing graduates with maritime-related qualifications in sufficient numbers; however, "the types of skills being produced are not in alignment with market needs'**. The study highlights an oversupply of graduates in areas that are more operational, but a undersupply in certain technical skills including the trade and professional categories. The result is a net gap of 3,786 graduates needed per year and skills pool that must be rebalanced. **This challenge requires 'not just a shift in the types of qualifications being offered or the content of curricula, but also shifts at policy and regulatory level to ensure that institutions have the capacity in terms of people, facilities and equipment** to deliver the needed skills.' Working groups are reportedly in various stages of conducting and finalising **skills audits to determine the skills needed over the next 5-20 years, as well as current supply and demand**.[292]

Partnering with private Technical & Vocational Education & Training (TVET) industries is one way to build public education capacity. TVET institutions should therefore be engaged in blue economy planning to ensure that training and education opportunities are fully aligned with broader national and local blue economy plans and aspirations. The newly unveiled Bandari Maritime College in Mombasa is currently developing its training curriculum for seafaring professions, but training and skills development need to go further and consider the indirect employment opportunities associated with different blue economy sectors. It is important to not only develop blue economy skills and knowledge in coastal cities but to also develop awareness of blue economy employment opportunities amongst students further inland.

A key consideration in developing human capital and skills development is that new skills be made available widely, to include historically marginalized groups within the city. For instance, in Mozambique and elsewhere **participation in some economic sectors is often demarcated along gender lines**. Men are primarily engaged in fishing, whilst women are engaged in selling and gleaning-gathering small fish along the shore.[293] Women in Mauritius are also poorly represented in the municipal workforce, policies should be implemented to promote women to positions of responsibility within the municipality.[294] Similarly, inclusive growth is a key concern in the Seychelles, where wealth concentrates in the hands of a few individuals. The Seychelles' GINI coefficient measure of wealth inequality, is high at 46.8.[295]

(t) Led by the African Union (AU) Commission, NEPAD Secretariat and the African Development Bank

(u) Officially launched in March 2017 implemented by the Government of Mauritius with financial assistance from India

▸ Image: Fisherwomen, Maputo. © Sopotnicki, Shutterstock

CLIMATE CHANGE ADAPTATION AND RESILIENCE

WIO coastal cities are vulnerable to climate change, because of rising sea-levels, coastal surges and erosion. The IPCC anticipates average sea level rise of up to 90cm in southern Africa by 2100, according to RCP8.5 (and more uniform rise of approximately 50cm according to the comparatively optimistic RCP2.6 scenario).[296, v]

Long term climate stresses and sudden climate shocks carry potential impacts for cities' blue economies, with wide-ranging effects on all major sectors that include destruction of tourist infrastructure, degradation of beaches and wildlife; flooding of port facilities and inland supply routes; destruction of waterfront properties from sea level rise and coastal flooding; disruption to fishing value chains as a result of changes to ocean water temperature, fish spawning and migration patterns; and reduced demand for non-renewable energy sources like oil and gas in recognition of their impacts on exacerbating the climate crisis. Beyond the direct impact on physical and natural blue economy infrastructure and sector-demand, **climate hazards threaten millions of WIO coastal residents**, often living in highly exposed and vulnerable coastal settlements, and often ill-equipped to absorb the increasing impacts of coastal flooding and other climate hazards. This provides a collective challenge to the blue economy from the perspective of livelihood and worker disruption, in addition to the obvious personal social impact of climate-driven disasters.

WIO cities on SIDS and mainland are vulnerable to rising sea-levels. 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 % chance of losses exceeding USD$1.9 billion, or 16 % of Mauritius' GDP."[297] Nacala, Mozambique is also vulnerable to rising sea levels, with 75% of the city's land area vulnerable to inundation due to climate change. There is the likelihood that 50% of the city's land area will be inundated by a one-in-100-year flood event. Coastal erosion has already caused damage to buildings along Nacala Bay and is projected to increase with sea level rise.[298] Close to one-fifth of Mombasa's could be submerged by a sea-level rise of 0.3 metres, with beaches, historic and cultural monuments and hotels along the coastline particularly affected as well as disruption to ecosystem functions and processes, water supply, and settlements.[299]

One other impact of the changing climate is an increase in inland flooding from heavier and more frequent rains. For example, Dar es Salaam is highly vulnerable to flooding even from minor storms as it is low lying areas. Climate projections for Dar es Salaam indicate mean rainfall could increase during the longer rainy season by 6% by 2100.[300] Small island cities such as Victoria and Port Louis are also vulnerable to pluvial flooding, and parts of Victoria are prone to landslides after heavy rainfall.[301] In Toamasina, Cyclone Ava destroyed 90% of the port city's electricity infrastructure. On average, Madagascar is hit by three to four of these aggressive storms each year. This has caused about USD$ 130 million of damage and USD$ 156 million in losses, or 2.9% of the country's 2017 GDP.

A combination of manmade and climate-related factors threatens valuable coastal ecosystems that have historically provided natural mitigation for coastal flooding. A 2017 study highlights the major threats posed by human settlement and salt works to Dar es Salaam, suggesting approximately 40% and 31% of the mangroves at Kunduchi and Mbweni are vulnerable. Promotion of incentive-based conservation schemes like community-based payment for ecosystem services was one of several control measures put forward.[302]

Most coastal cities in the region will be impacted by not one but a range of simultaneous climate impacts. Pemba in Mozambique is vulnerable to frequent extreme climate-related events such as cyclones, floods, erosion, and saltwater intrusion that threaten homes, businesses, farming and fishing areas, and the limited infrastructure. This was made apparent when Cyclone Kenneth made landfall north of the city on April 25, 2019 and caused substantial wind and water damage. Pemba is relatively data-poor and under-resourced; it is grappling with rapid development, unplanned growth, and is still lagging in the provision of many essential services.[303] Comoros is exposed to a

(v) Other anticipated effects of climate change on the region include uniformly hotter temperatures and changes in precipitation that vary within the WIO region, with higher rainfall anticipated for the horn of Africa and more mild reductions in southern Africa, including Mozambique and South Africa

wide range of natural hazards such as tropical storms, flooding leading to landslides and volcanic eruptions. These dangers regularly cause considerable damage to infrastructure and affect food security.

Some action is being taken by municipalities to improve planning and adaptation to climate change but many lack sufficient awareness and preparedness capacity. In Dar es Salaam, municipal and national government have used funding from the U.S.-based Adaptation Fund and the Global Environment Facility's Least Developed Countries Fund towards sea walls to protect the city from coastal flooding.[304] The City Council and Ministry of Lands, Housing and Human Settlements is currently reviewing a climate-resilient flood response plan that will reduce exposure from riverine flooding in the Msimbazi Valley. Similarly, in South Africa, eThekwini Municipality, Durban has considerable institutional capacity and has been a leader in conservation planning, developing an inventory of greenhouse gas emissions, and resiliency planning for climate change adaptation. There are numerous environmental programs and projects in place to improve the quality of eThekwini's environmental assets.[305] In Kilifi, Kenya, a 2017 study suggested that the county focus was more on short-medium term planning rather than longer-term climate hazards. Limited awareness and a lack of downscaled contextually appropriate climate information to inform local decisions were highlighted as specific challenges.[306] The County Government of Kilifi has expressed its commitment towards responding to climate-induced disasters and emergencies in the county, establishing a sensitization unit on disaster prevention and mitigation.[307] Across WIO cities, authorities need to work with scientists and communities to establish accurate hazard profiles, maps, projections and environmental baselines to inform appropriate zoning and inclusive planning, which takes into account the onset of climate change.

OPERATIONAL ENVIRONMENT - SUMMARY OF KEY ISSUES

ECONOMIC

SOCIAL

ENVIRONMENTAL

- **Sewage often goes into the ocean untreated from lack of SWM** - The resultant pollution inevitably has a negative impact on marine life, and as a consequence impacts blue economy sectors which rely on clean waters, such as fishing and tourism.
- **Diffuse pollution from agriculture and industry** – also impacts health coastal waters.
- **Systemic issues in solid waste management** - causing leaching into waters.
- **Linking infrastructure demands to population growth and economic development** (including blue economy investment). Ensuring related foresight and proactivity in small/ medium but rapidly growing towns and cities.
- **Improving transit of people and goods from WIO cities to other WIO cities and inland** – supporting blue economy sectors including tourism, fishing and port logistics.
- **Improving transit of people and goods within cities** - relieving urban congestion and increasing urban mobility and productivity, including support of tourism, fishing and port logistics.
- **Capacity and safety of water-based transit** – including local ferry crossings and opportunity for longer distance ocean transport regionally.
- **Availability of relevant, quality, accessible and inclusive blue economy training opportunities**, aligned to national and local blue economy ambitions. These opportunities should particularly engage and provide opportunities for disadvantaged local communities and groups.
- **National and local climate resilience and adaptation** - WIO cities are vulnerable to climate change, because of rising sea-levels, coastal surges and erosion but most local authorities lack capacity for resilience planning and adaptation.
- **Need for holistic, integrated blue economy planning and programming** across above issues.

CHAPTER 5

TOWARDS A ROADMAP FOR A BLUE ECONOMY IN THE WIO REGION

This Status Report set out to examine the relationship between WIO coastal cities and the blue economy, providing a foundation from which strategic and operational actions for cities in the region can stem. The 'Roadmap' document which accompanies this report presents strategic and operational recommendations in full and details the selection process. This chapter provides a brief reminder of issues explored in this report across blue economy sectors, alongside summarised Roadmap recommendations.

GOVERNANCE AND PLANNING

This report outlines several issues around blue economy governance including a need to find balance between the ambitions and activities of different blue economy actors, coordinate between marine planning tools and processes at different scales, establish mechanisms to engage local actors in national blue economy development and provide capacity for blue economy planning and implementation at the local scale.

REMINDER OF KEY ISSUES	
ECONOM. SOCIAL ENVIRO.	• National and local planning capacity • Local fiscal capacity • Local marine planning jurisdiction • Coordination and integration of marine planning processes • Bringing marine planning down to the local level • Progress in national and local climate resilience and adaptation.

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Establish national blue economy operationalisation framework and coordination unit, including mapping of ocean stakeholders and plans across scales.** Nationally, an operationalisation framework and/or co-ordination unit is a required foundation for conceptualising and initiating policies and projects affecting the blue economy (BE). Such a framework should engage and involve regional and local/city BE Stakeholders, possibly supported by a detailed mapping exercise of BE stakeholders at different scales and a coordination mechanism for multi-stakeholder involvement.
2 ND	Build BE knowledge and planning capacity of local government. i.e. MSP planning capacity and marine knowledge.
3 RD	Promote resilient, adaptive urban planning, enhancing development control & Environmental Social Impact Assessment (ESIA)
4 TH	Identify and map critical blue economy infrastructure, and prioritise climate change adaptation and disaster risk reduction measures
5 TH	Further research into sustainable multi-use of ocean spaces in blue economy planning

▸ Image p66:Waterfront, Maputo

SPECIFIC BLUE ECONOMY SECTORS

While, sector specific actions are separated under economic, social and environmental pillars providing a useful entry point to understanding issues, when moving onto recommendations, it should be noted that the reality is more complex. Many interdependencies exist and a recommendation will typically not only concern economic, social or environmental aspect but considerably affect all 3 pillars, for better or worse. The Roadmap process has been cognisant of this fact and strived for recommendations that can effectively balance economic, social and environmental concerns, mitigate negative cascading impacts and where possible strive for mutual benefits and virtuous affects.

▸ Image: Durban coastline

PORTS

Ports are key national assets and maritime trade is key to national and local economies. National and local priorities include the need to increase capacity to manage increasing demand, while local concerns also focus on creating jobs for citizens and ensuring economic benefits for the city. Environmenatally, Green Port policies need to tackle pollution associated directly and indirectly with port activity.

	REMINDER OF KEY ISSUES
ECONOM.	• City role in port activities • Capacity vs demand
SOCIAL	• Skills development for local populations associated with port development. • Employment Multipliers - Maximising indirect employment opportunities. • Tackling illicit trade – such as drugs and smuggling especially through FTZs • Social Impact - Managing economic demands with the needs of communities
ENVIRO.	• Managing direct environmental impacts from port expansion and activity. • Managing indirect impacts from port activity such as congestion and air pollution • Green port policies - offer an opportunity to mitigate environmental issues.

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Identify additional supply chain opportunities (processing, other value addition activities) economically proximate to existing port activities.** An opportunity exists for all WIO port cities to strengthen value addition services linked to port activity, creating both direct economic benefits and increasing port-related employment multipliers. City administrations and the private sector could collaborate to identify supply chain, processing, and support activities which are economically proximate to existing port activities in order to increase the volume of secondary jobs associated with existing city ports. Such activity would also improve the value-added to goods in transit.
2 ND	Strengthen ESIA processes regulating port expansion and promote and adopt Green Port principles and practices including dredging polices, ballast receptor requirements and wider pollution monitoring, especially in line with any port expansion plans.
3 RD	Economic diversification strategies to reduce city reliance on port revenue
4 TH	Assess and seek to improve the performance / efficiency of existing port operations, and of surrounding support systems, e.g. strengthen traffic management processes
5 TH	Strengthen port monitoring capacity of illicit goods and narcotics which find their way into local communities. Combine this with social initiatives at city level

TOURISM

Tourism is an important part of the economy of WIO cities. However, further industry investment, development of bespoke city tourism offerings, regional coordination, steps to ensure that spending filters down to local communities, and steps to regulate environmentally damaging activities and promote eco-tourism are all needed.

REMINDER OF KEY ISSUES	
ECONOM.	• Improving the investor climate and mechanisms for regional cooperation • Managing external shocks – such as terrorism and coronavirus. • Attracting beach-tourists to island cities • Boosting and diversifying tourist offering in WIO cities.
SOCIAL	• Distribution of tourist income down to local communities; training of youth and disadvantaged groups and building worker resilience to industry shocks • Local business rates – local business development vs revenue collection. • Tackling sex tourism largely driven by international visitors.
ENVIRO.	• Land-use planning and development control. • Direct and indirect tourism driven pollution • Damaging tourist activities – e.g. careless boating, diving, habitat trampling. • Ecotourism - can help actively protect and enhance marine habitats and MPAs and LMMAs - offer an opportunity for environmentally conscious tourism.

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Develop and promote city region tourist strategies, promoting local assets, local communities, connecting cities and beach resorts, and coordinating between regional tourist locations**. A city region tourism strategy can improve coordination between proximate tourism locations in WIO regions such as Mombasa, Diani and Kilifi in Kenya, or Dar es Salaam and Zanzibar in Tanzania. WIO cities within the same local region could work together, encouraging visitors to stop at several locations, all of which offer different experiences, enabling agglomeration effects rather than competition. On WIO islands one challenge for municipalities is that tourists often tend to head straight for beach resorts. Government-sponsored campaigns could promote an urban area's diverse architectural, historical and culinary offerings, offering an authentic experience to tourists interested in learning about and tasting local culture.
2 ND	Advocacy against unsustainable tourist behaviours (e.g. coral removal and littering)
3 RD	A 'One-stop shop' for obtaining licenses and tax relief incentives for local community businesses
4 TH	Develop city eco parks which can provide storm surge protection, increase biodiversity and attract visitors
5 TH	Promote and incentivise tourism experiences where profits are re-invested into conservation efforts.

FISHING

Fishing provides an important source of livelihood to fishermen, processors and traders and a crucial source of protein for city residents. However, poor catch and processing equipment reduces the potential of the local fishing industry across several WIO countries and cities and leads to unsustainable practices.

	REMINDER OF KEY ISSUES
ECONOM.	• Limited fishing capacity (vessels & ancillary equipment), processing and storage facilities • Maritime security and illegal fishing • Maritime clusters of companies with complementary skills or resources • Aquaculture and mariculture present opportunities beyond traditional fisheries
SOCIAL	• Building local capacity of local fishermen for better catches. • BMUs - Supporting these groups can increase local livelihoods and sustainability • Female Livelihoods - Fisheries sector potential to support female livelihoods
ENVIRO.	• Overfishing by small vessels in shallow waters • Unsustainable practices in deeper waters including illegal fishing • Pollution – both point and diffuse sources affects marine species • Seaweed farming – is widely regarded as the least damaging form of aquaculture • LMMAs and MPAs - are important tools that support sustainable fishing.

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Incentivise bulk buyers in WIO cities to buy local seafood produce. E.g. restaurants which can showcase local produce**. Create stronger linkages between smaller scale fisherfolk, workers in value addition services, and end of line buyers such as restaurants and hotels, in order to reduce reliance on imported fish and seafood. This recommendation is viewed as potentially of mutual benefit if delivered well. Local fishers would benefit from increased sales, while restaurants and hotels can attract visitors and perhaps even charge higher prices for local fish, appealing to visitors from both an experiential perspective, and those considering the sustainability of the meal, which can also be promoted.
2 ND	Multi-stakeholder research and local knowledge dissemination for sustainable fishing
3 RD	Robust, sustainable multi-stakeholder and multi-scale fisheries plans which support local communities
4 TH	Expand use of Marine Protected Areas, both off the coast of WIO cities and elsewhere along the coast, supporting stock restoration
5 TH	Identify opportunities for value retention and addition in WIO cities, e.g. cold storage, processing sites & markets.

WATERFRONT DEVELOPMENT

With the proper financing, planning and delivery, waterfront development can provide valuable public space for community cohesion and trade, while being respectful and protective of natural coastal and marine habitats. However, not all waterfront developments in WIO cities balance these factors and robust planning, development control and environmental impact assessment processes are necessary.

REMINDER OF KEY ISSUES	
	• Coordinated planning and implementation of different stakeholders and uses of space
ECONOM.	• Employment and tax revenue related to waterfront development • Operational costs including maintenance of waterfront areas • Storm surge and sea-level rise - pose an economic risk to waterfront developments
SOCIAL	• Historic, cultural and architectural value of waterfront neighbourhoods • Public realm - waterfront spaces can be key sites of social cohesion and wellbeing • Mixed use - successful waterfront redevelopment often contain public space mixed with high-end residential and commercial property for economic sustainability.
ENVIRO.	• Waterfront development along greenfield sites can have negative impacts • Greenified waterfronts can increase biodiversity and flood resilience and certain developments provide an opportunity to rehabilitate degraded spaces. • Combining tourist attractions with marine research through aquariums, nature reserves…

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Explore public-private partnerships (PPP) to facilitate waterfront development, including multiple area market analysis, land use assessment, financing, and/or operations.** Waterfront developments can provide high socio-economic value to WIO cities, but it is often a challenge to establish the necessary capital to get projects off the ground. Public administrations often face limitations in terms of financial and institutional capacity, human resource constraints and competing priorities. Private sector support may therefore enable the transformation of lower-value waterfront space into developments of high economic and social value. However sustainable public funding initiatives are important and any PPP needs to be a shared vision for the development, which balances environmental considerations with socio-economic factors.
2 ND	Develop national or regional guidelines and case study guidance for sustainable waterfront development
3 RD	Prohibit heavy waterfront development of green sites, through legislation; map coastal areas requiring protection; and promote inclusive regeneration /greenification
4 TH	Identify previously degraded, urban brownfield sites at/near water and rehabilitate as public spaces
5 TH	Develop projects which combine tourist revenue generation with the financing of marine science research and conservation.

OPERATING ENVIRONMENT

Blue economy planning must address the wider operational environment on land, for the blue economy to flourish. Holistic planning needs to make provision for the increased infrastructure demand which will also come from blue economy projects that stimulate economies and attract more people to coastal cities. Blue economy planning also needs to consider growing climate change risk both to BE sectors and coastal communities.

REMINDER OF KEY ISSUES	
ECONOM.	• Sewage often goes into the ocean untreated from lack of SWM • Diffuse pollution from agriculture and industry • Systemic issues in solid waste management • Linking infrastructure demands to population growth and economic development
SOCIAL	• Improving transit of people and goods to other WIO cities and inland • Improving transit of people and goods within cities • Capacity and safety of water-based transit • Availability of relevant, quality, accessible and inclusive blue economy training
ENVIRO.	• National and local climate resilience and adaptation • Need for holistic, integrated blue economy planning and programming

SUMMARISED ROADMAP RECOMMENDATIONS

1 ST	**Undertake city mapping of circular economy opportunities including livelihood opportunities for local communities; innovative plastic waste solutions; and systematic interventions with respect to recycling infrastructure and processes. Creation of city circular economy strategy.** Cities could work with national government, development partners, NGOs, the private sector and networks such as the African Circular Economy Network to map material and resource flows in and out of the city, and develop a holistic city circular economy strategy.
2 ND	Identify industrial pollution hotspots in or near WIO cities and prioritise monitoring resources to these zones. With respect to agriculture, provide free advisory services and training for farmers.
3 RD	Promote and incentivise responsible plastics and microplastics management, recycling and reduction through city-wide campaigns and public infrastructure.
4 TH	Improve sewage management through sensitisation of local community on household practices, on-site treatment at large developments and exploration of innovative sewage treatment solutions.
5 TH	Partner with TVET institutions to train and sensitise citizens for blue economy opportunities. Strengthen linkages between existing TVET institutions and universities and major city BE industries. Provide subsidised training for marginalised communities.

ROADMAP DISCUSSION AND CONCLUSION

The 'Roadmap for WIO Coastal Cities and the Blue Economy', details the recommendations summarised in this chapter in extensive detail, providing further elaboration for all recommendations and case study examples for the highest scoring recommendations in each sector. Readers are therefore encouraged to read that document for further understanding of recommendations outlined on the previous pages.

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?

Blue economy activities should seek to balance the above criteria in order to be considered truly sustainable. Investment in any one blue economy sector should not come at the expense of other sectors or actors.

Rapid urbanisation presents both a challenge and an opportunity for developing a blue economy in the WIO region and the preceding pages emphasise the need for holistic planning which not only considers economic, social and environmental impacts of investments but also the interdependent relationship of blue economy sectors and activities, with the wider urban environment.

Strengthening the blue economy in WIO coastal cities will involve a mix of cross-cutting strategies, and sector-specific policies that focus on growing local capacity in established blue economy sectors, alongside further exploration and investment in new and developing blue economy sectors. However, sectoral planning will not work in isolation and blue economy planning needs to understand and appreciate the interconnected relationship between urban and natural systems, including the dependency of both coastal and inland populations on healthy oceans for food, livelihoods and general health and wellbeing. Any future blue economy city strategies of course need to be coordinated with wider city visions and with national plans and objectives.

We now encourage national, city and local blue economy stakeholders to come together, and further consider the best actions moving forwards, for their city and hope that this report and the accompanying documents within this portfolio provide a solid foundation for future urban blue economy planning across the region.

▸ Image p75: Mauritius coastline

APPENDIX 1 - DEVELOPING BLUE ECONOMY SECTORS AND WIO CITIES

The below table outlines other BE sectors not yet prominent across WIO cities but with future growth potential. Cities are encouraged to consider these sectors, the likelihood of impending introduction on impact on their city, and associated challenges and opportunities. It is important that these sectors are considered early, in preparation for their potential future impact, and how this can be managed.

	CURRENT WIO CITY STATUS	
OIL AND GAS	Oil refineries currently exist in Durban, Dar es Salaam and Mombasa. In Mombasa, refining was suspended from 2013-2018 due to lack of supply and the site is viewed as being of limited economic viability.[308] Refineries are planned at Richards Bay and at an as yet confirmed location in Mozambique.[309] An oil/gas pipeline links the Port at Richards Bay to Johannesburg, with another oil pipeline planned from the port of Tanga, Tanzania to Uganda.[310] Oil and gas exploration has taken place off the coast of South Africa including between Durban and Richards Bay although as of September 2020 Exxon abandoned this project. In Kenya, the Turkana basin is the first national oil reserve but is lacking investors.[311] Waters off Tanzania and Mozambique hold significant gas reserves particularly around the border, at the Rovuma Basin site in Mozambique and Mnazi Bay area of Tanzania.[312] Tanzania has over the past decade successfully commercialised natural gas for local power generation but has reportedly been slow to finalise policies, laws and regulations for export. Mozambique leads the region in this respect, with billions of dollars of foreign investment committed to Liquid Natural Gas development.[313] Most recently, there has been planning for a pipeline from Rovuma Basin to Richards Bay.[314] A gas pipeline exists from Mtwara to Dar es Salaam.[315] The decision not to refine gas locally resulted in deadly riots in Mtwara after locals had been told during election campaigns that Mtwara would become 'the new Dubai'.[316]	ECONOM. SOCIAL ENVIRO.
TIDAL AND WAVE ENERGY PRODUCTION	Both tidal and wave energy are reportedly in the early stages of exploration across WIO countries.[320] Tidal energy exists across several WIO countries (Kenya, Tanzania, Mozambique, South Africa and the west coast of Madagascar), but only South Africa is seen as having significant wave energy potential.[321]	ECONOM. SOCIAL ENVIRO.

CHALLENGES	OPPORTUNITIES
• National challenge in attracting investment required for exploration of reserves. Especially in a post-COVID market and time of declining oil demand/prices; • Locally, possibly the same issues may exist as discussed under ports and maritime trade whereby the city does not have much influence on local activity and has to rely largely on downstream revenue generation.	• Reserves present a national economic opportunity for many countries; • Locally, cities in which productive refineries are located may benefit from direct and cascading income.
• Health risks from refinery emissions; • In cases, questions regarding the degree of distribution of income to, and creation of opportunities for local communities at/near sources of oil and gas; • Potential displacement of homes and livelihoods for pipeline projects.	• Direct and downstream employment opportunities from refinery activity and pipeline projects. For example, the upcoming oil pipeline in Tanzania will reportedly create more than 18,000 jobs for Tanzanians;[317] • Connecting households to natural gas systems.[318]
Oil: • Water pollution due to solid and liquid effluents from oil transport, plant accidents and risk of spills; Oil drilling affect on ocean habitats; Methane & combustion emissions.[319] Gas: • Gas pipelines can disturb habitats; Methane: short-lived pollutants; CO2 from combustion; Burns cleanly, but still has emissions.	• If pursued best practices should of course be followed but no environmental benefits suggested for oil or gas activity.
• At present it is suggested that solar and wind are more viable forms of renewable energy;[322] Best as local production; • Tidal installations can require large expanses of ocean space and may compete with other uses.	• Future advances might reduce the implementation costs of these forms of energy making tidal/wave energy more viable for WIO countries; • Predictable forms of energy.
• Potential costs of such energy installation might be felt by locals.	• Reliable form of local, green electricity.
• Turbidity, salinity and sediment movements; • Installations can harm marine life and habitats.[323]	• Green form of energy, with limited pollution.

CURRENT WIO CITY STATUS

OFFSHORE WIND

East and Southern Africa has relatively strong wind power, including coastal areas. Mauritius for example, aims to source 8% of its energy from wind by 2025,[324] while in Seychelles, wind energy currently produces around 7GWh of electricity a year at Victoria.[325]

ECONOM.

SOCIAL

ENVIRO.

MARINE BIOTECHNOLOGY

Marine Biotechnology (pharmaceuticals, chemicals, seaweed harvesting, seaweed products and other marine derived bio-products) is a relatively underexplored BE sector in the WIO region but significant potential exists. 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 1100 leading commercial medicinal plants" as of 2011.[326]

It is reported that across WIO countries, only Mozambique has a coherent biotechnology plan.[327] South Africa and Kenya have elements of biotech in plans, and the former has several ocean research institutions including in Durban.[328] Mauritius has also identified marine bio-technology as a priority area for further development. On Mauritius, Port Louis is home to the University of Mauritius, Association for African Medicinal Plants Standards, the Mauritius Research Council and various private companies supporting elements of the marine biotech supply chain.

Coastal cities will to some extent be dependent on development in national bio-prospecting policy and legislation which facilitates industry growth locally. However World Bank highlight that 'Capacity-building and technology transfer relating to marine bioprospecting is likely to increase with the ongoing implementation of the Nagoya Protocol to the Convention on Biological Diversity (CBD), under which researchers expecting to commercialize natural products are required to share benefits with the host country'. Listed benefits include both direct financial benefits and wider partnerships between researchers in developing countries with capacity building and technology transfer (e.g. establishing laboratory facilities in developing country universities).[331] Coastal cities could be cognisant of this opportunity and seek explore and create an enabling environment for universities and marine research locally.

ECONOM.

SOCIAL

ENVIRO.

CHALLENGES	OPPORTUNITIES
• Reliable source of domestic energy with strong potential across the region.	• Space for aquaculture beneath wind turbines enables multiple use of space. Increasing demand can lead to economies of scale.
• Some may not like the visual impact of turbines on the coast; skilled employment may not necessarily support locals directly.	• Job training/creation; cascading benefits to local service industries. Clean energy for homes.
• Little reported water impact but hazardous to coastal birds.	• Arguably the least environmentally damaging form of ocean related energy process.
• Finding required finance to develop biotech industry, related capacity buiding; • Patent protection and regulatory hurdles; • Political disputes over territory.	• Potentially a lucrative industry if funding obstacles can be overcome. The importance of marine organisms for bioprospecting for food as well as pharmaceutical products is a rich area for research and development, for example: Shark DNA for cancer treatment in addition to the use of seaweed products. These generate high-value products, beyond the use of the primary marine resources. • The global Marine Pharmaceuticals market is valued at 22400m USD in 2018 and will reach 39650m USD by the end of 2025, growing at a CAGR of 8.5% during 2019-2025.[329] • WIO coastal city universities could pursue partnerships with researchers in this space.
• No significant impacts identified although any biotech interventions which inadvertently affect local ecosystems and marine health might have some impact on other BE livelihoods; • Possible local opposition to any research which is deemed to go against ethical/cultural sensitivities.	• Development of research capacity in WIO cities; • Development of new drugs; • Any biotech interventions which contribute to healthier waters could benefit other BE livelihoods; • Small scale direct and indirect employment benefits in WIO cities that host research institutions / laboratories.
• Activity needs to be carefully managed including any aquaculture sub-component to ensure sustainability; • If scientists modify living organisms, such actions could potentially have an effect on the wider ecosystem and should be carefully considered/ managed.	• Biotech is a broad field and benefits include green energy from micro-algae; development of cost-effective and non-toxic coatings (paint, anti-fouling, etc.) and contribution to more sustainable farming;[330] • Marine biotechnology advancements can help in identification of toxic organisms and diseases.[332]

CURRENT WIO CITY STATUS

ECONOM.

SOCIAL

ENVIRO.

MINERALS AND MINING

Deep-sea mining is an as yet unexploited blue economy sector in the region with little activity by either state entities or corporations sponsored by African states, although there is growing interest in the sector.[333]

Near the coast, mining operations exist in several WIO locations including limestone quarries and/or cement works in Dar es Salaam, Durban and Mombasa.

CHALLENGES	OPPORTUNITIES
Deep sea mining: • Question marks regarding how much of generated income would flow into WIO cities; • Territorial and rights issues.	Deep sea mining: • Potentially lucrative to those companies and governments who are granted mining licences; Coastal mining: • Locally, cities in which mines are located may benefit from both direct and indirect income generation.
Deep sea mining: • Impacts from mining activities could affect ocean health, which in turn could affect other BE sectors and livelihoods; • Ethical opposition. Coastal mining: • Pollution and dust from mining activities • Possible displacement at point where mining commences or opereations expand.	Deep sea mining: • Downstream social development benefits from income generated. Coastal mining: • Source of direct local employment; related indirect employment opportunities; • At Haller Park, Mombasa, Lafarge Holcim dedicate parts of the limestone quarry as a nature park and education centre (see Mombasa case study report for more information).
Deep sea mining: • Disturbance of the seafloor can alter and in cases destroy deep-sea habitats, leading to the loss of species and fragmentation or loss of ecosystem structure and function. One mining site can possibly wipe out an entire species. • Sediment plumes can affect ecosystems and species, which could also be affected by noise, vibrations and light pollution caused by mining equipment and surface vessels, as well as potential leaks and spills of fuel and toxic products.[334] Near coast terrestrial mining: • Habitat loss; • Air pollution.	Deep sea mining: • No real identified positive environmental impacts or opportunities. • Need for robust environmental legislation including basline studies and EIA of proposed mining activities. Near coast terrestrial mining: • Evidence from Haller Park, Mombasa has demonstrated good practice in mixing mining operations with green regeneration and biodiversity efforts (see Mombasa case study report).

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