

***A STRATEGIC FRAMEWORK FOR PRIVATE SECTOR ENGAGEMENT IN  
THE WESTERN INDIAN OCEAN REGION***

**ASSESSMENT REPORT**

30 November 2020

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## **Acronyms**

ASCLME	Agulhas and Somali Current Large Marine Ecosystems Project
AMCEN	African Ministerial Conference on the Environment
AMCOW	African Minister's Council on Water
BBNJ	Marine Biological Diversity of areas beyond national jurisdiction
BMU	Beach Management Unit
CBD	Centre for Biological Diversity
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention for Migratory Species
CO2	Carbon Dioxide
COMESA	Common Market for Eastern and Southern Africa
DANIDA	Danish International Development Agency
EAC	East African Community
EAF	Ecosystem approach to fisheries
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
FFI	Fauna and Flora International
FIRI	Fishing Industries Research Institute
GAPCM	Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
GIA	Global Industry Alliance
GloMEEP	Global maritime energy efficiency partnership

GSTC	Global Sustainable Tourism Council
GT-Active	Green Tourism Active
HABS	Harmful algal blooms
ICES	International Council for Exploration of the Seas
ICRI	International Coral Reef Initiative
IFI	International Financial Institutions
IGAD	Intergovernmental Authority on Development
IMO	International Maritime Organisation
IOC-CIO	Indian Ocean Commission
IOI	International Ocean Institute
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPIECA	Global oil and gas industry association for advancing environmental and social performance
ISSF	International Seafood Sustainability Foundation
ITOPF	International Tanker Owners Pollution Federation
IUCN	World Conservation Union
IW	International Water
IWC	International Whaling Commission
KMFRI	Kenya Marine and Fisheries Research Institute
LME	Large Marine Ecosystem
LMMA	Locally Marine Managed Area
MASMA	Marine Science for Management Programme
MEAs	Multi-Lateral Environmental Agreements
MIHARI	Madagascar Locally Marine Managed Area

MMCFPD	million cubic feet per day
MOU	Memorandum of Understanding
MPA	Marine Protected Area
NEPAD	New Partnership for African Development
NC	Nairobi Convention for the Protection, Management and Development of the Coastal and Marine Environment of the Western Indian Ocean
NGO	Non-governmental organisation
NOAA	National Oceanic Atmospheric Administration
ONTM	Madagascar National Tourism Board
ORI	Oceanographic Research Institute
PMAESA	Port Management Association of Eastern and Southern Africa
RCC	Regional Coordination Centre
RECs	Regional Economic Communities
RFA	Responsible Fisheries Alliance
RFMOs	Regional Fisheries Management Organisations
SABBWWA	South African Boat Based Whale Watching Association
SADC	Southern African Development Community
SADSTIA	Southern African Deep-Sea Trawling Association
SAP	Strategic Action Programme
SDG	Sustainable Development Goal
SFP	Sustainable Fisheries Partnership
SIOFA	Southern Indian Ocean Fisheries Agreement
SME	Small and medium-sized enterprises
SWIO	South Western Indian Ocean
SWIOFISH	Southwest Indian Ocean Fisheries Governance and Shared Growth Project

SWIOFC	South West Indian Ocean Fisheries Commission
SWIOFP	Southwest Indian Ocean Fisheries Project
TAFIRI	Tanzania Fisheries Research Institute
TCF	trillion cubic feet
TDA	Transboundary Diagnostic Analysis
TNC	The Nature Conservancy
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO-IOC	The United Nations Educational, Scientific and Cultural Organization - Intergovernmental Oceanographic Commission
UWAWADA	Dar es Salaam Small-Scale Fishers' Association
WIO	Western Indian Ocean
WIO-LaB	Addressing land-based Activities in the Western Indian Ocean
WIO LME SAPPHERE	Western Indian Ocean Large Marine Ecosystems Strategic Action Programme Policy Harmonisation and Institutional Reforms
WIOMSA	Western Indian Ocean Marine Science Association
WIO-SAP	Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities
WIOP	Western Indian Ocean Partnership
WIOSEA	Western Indian Ocean Sustainable Ecosystem Alliance
WOC	World Ocean Council

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## Executive Summary

The Western Indian Ocean (WIO) covers approximately 22.3 million square kilometres and includes two well-known Large Marine Ecosystems (LMEs): the Agulhas Current LME and the Somali Current LME. It is bordered by the countries of Eastern Africa from South Africa to Somalia and encompasses a number of Small Island Developing States. The region faces significant pressure on the marine environment, through land-based activities, coastal population growth, climate change, poorly regulated inshore and offshore fishing, and maritime activities such as shipping and offshore oil and gas exploration and development and coastal and marine tourism. Emerging sectors include renewable energy, marine bioprospecting and seabed mining may exacerbate these pressures in the future.

While there are multiple legal agreements that are applicable in the WIO, the key regulatory platform for the protection, management and development of the marine and coastal environment is the Convention on the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention), 1985 as amended in 2010. Over the years the Nairobi Convention has implemented a series of projects aimed at addressing the activities impacting the WIO, with one of the current projects being the *Western Indian Ocean Large Marine Ecosystems Strategic Action Programme Policy Harmonisation and Institutional Reforms* (WIO LME SAPPHIRE).

Component 3 of WIO LME SAPPHIRE is focused on the development of partnerships with the private sector with a view to securing commitments to mainstreaming of ecosystem-based management in their operations and management practices. This is in keeping with the widespread and growing recognition in regional and global level policy frameworks and agreements that the private sector should be a key partner in promoting sustainable development and contributing to the conservation and protection of marine and coastal ecosystems. The current assessment report is intended to support the development of a private sector engagement strategy for the WIO region which in turn will lead to partnerships aimed at reducing stress on its ecosystems.

For the purposes of this report, the private sector is considered to be those enterprises that are run by individuals and companies and are not state controlled. These range from micro-enterprises to cooperatives to multinationals, including financial institutions, trade associations and organizations that represent private sector interests and philanthropic foundations.

The report provides an overview of the key maritime sectors of the region including fisheries, tourism, shipping and ports, shipbuilding and repair, oil and gas, renewable energy, mining, desalination and undersea cabling. There is a description of each sector, including a summary of key stakeholders and an overview of environmental impacts associated with each. In addition, the report reviews existing private sector involvement in partnerships aimed at coastal and marine conservation and protection interventions.

In concluding, the report notes that although there are a number of partnerships related to marine ecosystem management and conservation in the region, many of which have

highlighted private sector partnerships as an important objective, results have been limited. Moreover, even where MOUs have been signed, they have often resulted in little or no subsequent joint action. The report therefore presents a number of **recommendations** regarding the focus and approach of a private sector engagement strategy which are aimed at addressing these challenges. These include:

- If partnerships with the private sector are to be effective, it is essential that there are **mutual benefits** for all parties;
- The approach to developing partnerships should be strategic with **prioritisation** based on criteria such as the level of stress placed on the WIO and the likelihood of achieving positive change;
- Given the **diversity** of the private sector in the region, it is important that the strategy considers a range of partnerships taking into account the size of the entities involved (from micro to multinational);
- Partnerships should have clear **objectives** and outcomes;
- The **scale, scope and type** of partnership should be selected depending on the objectives. For example, partnerships focused on communication or standard-setting may include a broad range of stakeholders, while those seeking more tangible outcomes should adopt a more focused, incremental approach;
- The **role** of the private sector should not be limited to the provision of funding, and should be clearly articulated in the design of a partnership;
- Partnerships should be developed with different **types of private sector organisation** depending on the objectives – from private sector representative organizations, to individual companies, to those representing targeted groups such as women and youth;
- Due regard must be given to **existing initiatives** in the region.

## 1. Introduction

The countries and overseas territories of the Western Indian Ocean (WIO) region<sup>1</sup> have a combined population of 244.5 million and a total GDP of US\$583.6 billion. The countries of the region are highly diverse in terms of their geography and socio-economic context – they include continental states and island states, economies of widely differing levels of complexity and size, as well as differing population and development dynamics. Four countries in the region (Tanzania, South Africa, Kenya and Mozambique) have populations in excess of 30 million, while the three small island states in the region (Comoros, Mauritius and Seychelles) have populations of less than 2 million. All states in the WIO region, however, share a common reliance on the marine and coastal environment. This relates not only to particular economic sectors such as maritime trade, fisheries and tourism, but also more diverse marine and coastal ecosystem services that support livelihoods and economic activity across the region. Indeed, it has been estimated that ocean assets of the WIO region can be valued at US\$ 333.8 billion and produce an annual output of US\$ 20.8 billion.<sup>2</sup>

However, the region's rapidly growing population is exerting significant pressure on the marine environment, through pollution, degradation of critical coastal habitats and changes in the freshwater flow and sediment loads from rivers draining into the WIO. Today, the coastal zone of the region hosts major cities, harbours, industries and other development infrastructure that is increasingly posing a threat to the integrity of the coastal and marine ecosystems. Other pressures are associated with high volumes of tourism and poorly regulated inshore and offshore fishing, activities that have increased considerably in the recent past. The scale and scope of maritime activities are also expanding, with emerging sectors such as marine bioprospecting and seabed mining, as well as the expansion of fisheries and offshore oil and gas exploration and development activities. Furthermore, climate change presents a range of threats to the region.<sup>3</sup>

The cross-boundary nature of the region's coastal and marine environmental challenges led to the establishment of the Nairobi Convention for the protection, management and development of the coastal and marine environment of the Western Indian Ocean in 1985. The Nairobi Convention is a partnership between governments, civil society and the private sector, working towards a prosperous WIO region. It offers a regional legal framework and coordinates the efforts of the member states to plan and develop programmes that strengthen their capacity to protect, manage and develop their coastal and marine environment. The Convention has informed a series of important regional projects and programmes, including the *Agulhas and Somali Current Large Marine Ecosystems Project* (ASCLME, 2008-2014) and the *Project Addressing Land-based Activities in the Western Indian*

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<sup>1</sup> Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa and Tanzania.

<sup>2</sup> Available at: <https://cordioea.net/wio-ocean-economy/>

<sup>3</sup> SAP:

[https://wedocs.unep.org/bitstream/handle/20.500.11822/8777/SAP\\_protection\\_coastal\\_marine\\_WesternIndianOcean.pdf?sequence=1&mp%3BisAllowed=](https://wedocs.unep.org/bitstream/handle/20.500.11822/8777/SAP_protection_coastal_marine_WesternIndianOcean.pdf?sequence=1&mp%3BisAllowed=)

*Ocean* (WIO-LaB, 2005-2010). Currently, two major programmes are being implemented in the region, the *Western Indian Ocean Large Marine Ecosystems Strategic Action Programme Policy Harmonisation and Institutional Reforms* (WIO LME SAPPHIRE), which has been developed to promote the implementation of the Strategic Action Programme (SAP) developed through ASCLME, and *Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities* (WIO-SAP), which in turn promotes the implementation of the SAP developed through WIO-LaB.

The current assessment report has been developed to support the development of a private sector engagement strategy in the WIO region. The report supports the implementation of the WIO LME SAPPHIRE programme and addresses in particular component three of the project, Private Sector Commitment, through which it is recognized that, “in order for ocean governance and management to be effective, ocean-related businesses—such as the tourism industry, large-scale fisheries, shipping companies, mining, water transport, etc.—must be involved”.<sup>4</sup> Under this component, WIO LME SAPPHIRE has committed to work with the private sector to mainstream ecosystem-based management in their operations and management practices.

This assessment report addresses the following:

- Mapping all the private sectors and maritime industries (from industrial to small-scale) operating in the WIO region.
- An assessment of the private sector and maritime industry operations and their impact on coastal and marine ecosystems in the WIO region.
- An assessment of the efforts of these private sector operations towards conservation and protection interventions.
- Consultation with key partners and identification of existing partnership practices.
- An examination of existing global and regional strategies, programmes and national policies, acts, legislations and regulatory frameworks that promote private sector engagement in LME or ecosystem management and conservation.
- Identification of potential high priority private sector partners to engage with to jointly address stress reduction within the region’s large marine ecosystems, and provide support to SAP implementation.

In terms of methodological approach, the assessment relied on a review of primary and secondary data related to the themes outlined above. Country level analyses carried out as part of the ASCLME Coastal Livelihoods Assessment (2012)<sup>5</sup> and the Regional State of the

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<sup>4</sup> Available at: <https://www.nairobiconvention.org/nairobi-convention-projects/the-western-indian-ocean-large-marine-ecosystems-strategic-action-programme-policy-harmonisation-and-institutional-reforms-wio-lme-sapphire/sapphire-components/>

<sup>5</sup> ASCLME Coastal Livelihoods Assessment (2012)

Coast Report: Western Indian Ocean (2015)<sup>6</sup> were important sources of information on key maritime sector operations and their impact on coastal and marine ecosystems in the WIO region. A survey was conducted to assess current activities, opportunities and challenges relating to private sector partnerships in the WIO region. The survey was distributed through various networks in the WIO region, as well as a database developed as part of the assessment processing detailing private sector actors (including industry associations and small-scale operators) within key maritime sectors in the region. The survey was also distributed to government, civil society, academic and institutional stakeholders in the region. A total of 78 survey responses were received. In certain cases, survey responses were followed up with more detailed interviews.

It should be noted that the review of key maritime sectors and partnership practices includes examples drawn from the entire maritime zone of South Africa (e.g. Cape Town), even though the southern and western areas falls outside the FAO Statistical Area 51 that is commonly used to define the Western Indian Ocean. Inclusion of these examples were considered appropriate given their importance to South Africa's blue economy and South Africa's position as a Nairobi Convention Contracting Party.

The following chapter outlines the approach taken to defining the private sector for the purposes of this report and specifies key maritime industries that were the focus of the assessment. Chapter three provides an overview of global, regional and national legal and policy frameworks supporting private sector involvement in large marine ecosystem management and conservation. In chapter four the key maritime sectors of the region are presented – this includes a brief overview of the structure and recent developments of each sector, a mapping of key relevant stakeholders, and an overview of environmental impacts associated with each sector. Chapter five reviews private sector involvement in partnerships aimed at coastal and marine conservation and protection interventions, while the final chapter presents recommendations around the focus and approach of the private sector engagement strategy.

## **2. Key Marine and Coastal Sectors of the Western Indian Ocean Region**

Africa's private sector accounts for over four-fifths of total production, two-thirds of total investment, and three quarters of total credit to the economy; it further employs about 90% of the employed working age population.<sup>7</sup> As outlined in the following chapter, there is

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<sup>6</sup> UNEP-Nairobi Convention and WIOMSA (2015). The Regional State of the Coast Report: Western Indian Ocean. UNEP and WIOMSA, Nairobi, Kenya

<sup>7</sup> Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African%20Development%20Report%202011%20-%20Chapter%201-The%20Role%20of%20the%20Private%20Sector%20in%20Africa%E2%80%99s%20Economic%20Development.pdf>

widespread recognition in regional and global level policy frameworks that the private sector should be a key partner in promoting sustainable development and contributing to inclusive governance processes, including the development and governance of sustainable blue economies.

The private sector is by no means a homogenous grouping – Africa’s private sector includes local and international firms and varies in scale from multimillion-dollar investments to the smallest micro enterprises. The roadside vendor beside a basket of smoked fish is as much a part of Africa’s private sector as the investor emerging from a glass and steel high rise in one of Africa’s burgeoning cities. Indeed, small and medium-sized enterprises (SMEs) comprise the backbone of Africa’s economy, accounting for approximately 90% of all companies and providing nearly 80% of the region’s employment.<sup>8</sup>

For the purposes of this report, the private sector is the part of the economy that is run by individuals and companies and is not state controlled. It ranges from micro-enterprises to cooperatives to multinationals and includes for-profit enterprises; companies or businesses regardless of size, ownership or structure; as well as private financial institutions, trade associations and organizations that represent private sector interests. It also includes corporate philanthropic foundations. It is noted that this conceptual boundary is not always clear; some publicly-owned companies operate in many respects as private businesses, consideration should be given to public private partnerships, academic institutions are not easily classified in these terms, many nongovernmental organizations and community-based organizations may have both for-profit and nonprofit components and, at the small and micro enterprise scale, the boundary between subsistence and for-profit activities is often blurred.

The focus of the assessment is on maritime sectors, given that the emphasis is primarily on private sector engagement related to partnerships for marine and coastal protection, management and development. It should be noted that the marine and coastal environment is impacted by broader economic activity beyond those sectors typically associated with the coastal and maritime domain (e.g. the construction industry and urban development more broadly), as well as inland sectors (e.g. poor management of industrial waste or poor land management practices inland can lead to pollution and undermine ecosystem functioning in estuarine and coastal environments).

The assessment focuses on the following sectors:

- Capture Fisheries
- Mariculture
- Fish Processing and Trade
- Marine and Coastal Tourism
- Maritime Trade (Shipping and Ports)
- Shipbuilding and Ship Repair

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<sup>8</sup> Available at: [https://www.lseg.com/sites/default/files/content/documents/Africa\\_SMEfinancing\\_MWv10.pdf](https://www.lseg.com/sites/default/files/content/documents/Africa_SMEfinancing_MWv10.pdf)

- Oil and Gas
- Coastal and Offshore Renewable Energy
- Coastal and Seabed Mining
- Desalination
- Undersea Cabling and Repair

Countries	Total GDP, 2018 (US\$ billion)	% of WIO GDP	Population	% of WIO Population
Comoros	US\$1,2	0.2%	832,322	0.35%
Kenya	US\$87,9	14.9%	51,393,973	21.45%
Mozambique	US\$14,7	2.5%	29,495,036	12.31%
Mauritius	US\$14,2	2.4%	1,265,000	0.53%
Madagascar	US\$13,8	2.3%	26,262,307	10.96%
France (Réunion)	US\$22,3	3.8%	889,729	0.37%
France (Mayotte)	US\$3,3	0.6%	279,471	0.12%
Seychelles	US\$1,6	0.3%	96,762	0.04%
Somalia	US\$4,7	0.8%	15,001,000	6.26%
South Africa	US\$368,3	62.4%	57,779,906	24.11%
Tanzania	US\$58,0	9.8%	56,318,000	23.50%
<b>Total</b>	<b>\$590</b>		<b>244,450,684</b>	

Source: World Bank

### Key Stakeholders – General Business Environment

Key stakeholder categories, along with illustrative examples for each maritime sector addressed in this assessment, are outlined in chapter four of this report. At a more general level, recognising that the coastal and maritime domain is impacted by various economic activities that extend beyond the coastal and maritime domain itself, it is proposed that regional, national and sub-national chambers of commerce and business councils are considered relevant stakeholders. While the broad remit of these representative organizations may mean that they are not high priority candidates for the establishment of marine governance-related initiatives, they may play an important role in information dissemination between key governance actors and the private sector.

Main categories	Illustrative Examples*
Regional Chambers of Commerce	<ul style="list-style-type: none"> <li>▪ East African Business Council</li> <li>▪ SADC Business Council</li> <li>▪ Association of the SADC Chambers of Commerce and Industry</li> <li>▪ COMESA Business Council</li> <li>▪ Cap Business Océan Indien</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Indian Ocean Business Forum</li> </ul>
National Chambers of Commerce	<ul style="list-style-type: none"> <li>▪ Câmara do Comércio de Moçambique</li> <li>▪ Kenya National Chamber of Commerce and Industry</li> <li>▪ Tanzania National Business Council</li> </ul>
Provincial or city-level Chambers of Commerce	<ul style="list-style-type: none"> <li>▪ Durban Chamber of Commerce and Industry</li> <li>▪ Zululand Chamber of Commerce and Industry</li> </ul>

### 3. Legal and Policy Context for Private Sector Involvement in the Sustainable Management of the Large Marine Ecosystems

#### 3.1 Background

Large Marine Ecosystems (LMEs) are regions of ecological unity of ocean space extending from river basins and estuaries to the outer margins of continental shelves and seaward boundaries of coastal current systems. LMEs typically span the maritime domain of several states. Two LMEs are found in the Western Indian Ocean, the Agulhas Current LME and the Somali Current LME. The LME approach considers accommodating human utilization of its resources while maintaining ecosystem integrity and it can be used as a means to integrate ecosystem-based management (EBM) into the governance of marine resources.

The geographical approach to defining management units puts the emphasis on ecosystem functioning.<sup>9</sup> To manage, preserve and protect the ecosystem functioning of these LMEs, it is necessary to draw on existing international, regional and national legal frameworks and policies around ocean governance and co-operation. Ultimately, the successful implementation of these legal instruments depends on mechanisms such as LMEs, which is the focus of this section. As a regional framework and a science-informed process, the LME approach is vital to successful ocean governance and could be an engine for achieving the **2030 Agenda for Sustainable Development**, especially **Sustainable Development Goal (SDG) 14 – Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development**.<sup>10</sup>

Numerous calls have been made for greater private sector engagement in regional ocean governance, including the SDG targets of enhancing the “global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the

<sup>9</sup> United Nations (2018). *GEF LME: Large Marine Ecosystems Strategic Approach Toolkit*. Paris <https://iwlearn.net/resolveuid/7699de40-3ee5-41f1-80d8-ec64333758c7>

<sup>10</sup> More information on how the GEF projects through the LME Approach is already contributing to achieving the ten SDG 14 targets, and how country-endorsed SAPs under implementation can contribute to achieving the targets at <https://www.iwlearn.net/documents/23964>.



sustainable development goals in all countries, in particular developing countries” and to encourage and promote public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.<sup>11</sup>

African policy frameworks calling for greater private sector engagement include the **New Partnership for Africa’s Development (NEPAD)**, and the **African Union’s Agenda 2063: The Africa we want**, and the **Common African Position on the Post-2015 Development Agenda**.<sup>12</sup>

The outcome of the UN Conference to Support the Implementation of Sustainable Development Goal 14 and the 2030 Agenda, **“Our Ocean, Our Future: Call for Action”** adopted by resolution in 2017<sup>13</sup> also calls upon all stakeholders to “conserve and sustainably use the oceans, seas and marine resources for sustainable development by taking, inter alia, the following actions on an urgent basis, including by building on existing institutions and partnerships” and to “strengthen and promote effective and transparent multi-stakeholder partnerships, including public-private partnerships, by enhancing engagement of governments with global, regional and sub-regional bodies and programmes, the scientific community, the private sector, the donor community, non-governmental organizations, community groups, academic institutions and other relevant actors”.<sup>14</sup>

A key strategy is the **2019 UN Environment Programme Strategy for Private Sector Engagement** following the UN Environment Assembly’s resolution **“Addressing Environmental Challenges Through Sustainable Business Practice.”**<sup>15</sup> It builds on the UN Environment Assembly’s Decision related to the Programme of Work and Budget for the Biennium 2020–2021, which calls on the Executive Director to mobilize increased voluntary funding from a broadened contributor base, using strengthened due diligence procedures prior to accepting funds other than from member States. Other intergovernmental mandates that support this strategy include, the 2030 Agenda and its 17 Sustainable SDGs and the Ministerial Declaration of the 4<sup>th</sup> Session of the UN Environment Assembly calling for “promoting sustainable and innovative financing opportunities and mechanisms to unlock new capital for sustainable investment and upscaling of sustainable business models, with a special focus on small and medium-sized enterprises” and for “seeking out innovative solutions to environmental challenges by strengthening partnerships between the public and private sectors and academia for accelerating the uptake and upscaling of those solutions”.<sup>16</sup>

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<sup>11</sup> SDG Target 17.16 and 17.17 available at <https://sdgcompass.org/sdgs/sdg-17/>

<sup>12</sup> African Union (2014) *Common African Position on the post-2015 development agenda* available at [https://au.int/sites/default/files/documents/32848-doc-common\\_african\\_position.pdf](https://au.int/sites/default/files/documents/32848-doc-common_african_position.pdf)

<sup>13</sup> United Nations General Assembly (2017) *Our ocean, our future: call for action* A/RES/71/312 available at <https://undocs.org/A/RES/71/312>

<sup>14</sup> 13 (c) United Nations General Assembly (2017) *Our ocean, our future: call for action* A/RES/71/312 available at <https://undocs.org/A/RES/71/312>

<sup>15</sup> This decision is founded in the Governing Council’s Decision 22/7 (2003) *Engaging business and industry* UNEP/EA.4/RES.4 available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/28500/English.pdf?sequence=3&isAllowed=y>

<sup>16</sup> UNEP (2009). *Strategy for Private Sector Engagement*. Nairobi, Kenya, 29 pp at 20.

The United Nations Conference on Trade and Development (UNCTAD), the Commonwealth Secretariat and the UN Division for Ocean Affairs and Law of the Sea (DOALOS) are working together to develop Oceans Economy and Trade Strategies (OETS). In the Seychelles for instance the Blue Economy Strategic Framework and Roadmap, now in its implementation phase, aims to create an enhanced environment for private sector development and investment in ocean-related sectors.

Regionally, the **Convention on the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention)**, 1985 as amended,<sup>17</sup> is the legal platform for the protection, management and development of the marine and coastal environment in the WIO region.

In 2018, the Nairobi Convention adopted a decision<sup>18</sup> on the proposed work programme for the period [2018–2022 for the implementation of the Nairobi Convention](#). One of the specific objectives of this work programme is to engage stakeholders in the public and private sector in greening operations and management practices for innovative ocean governance.<sup>19</sup> Acting as a platform to promote synergies and for coordinating the implementation of regional initiatives for the protection of the marine and coastal environment, various projects<sup>20</sup> are undertaken by the Secretariat together with other institutional partners that promote public engagement in the WIO region, including the current WIO LME SAPPHIRE and WIO-SAP programmes. Both these projects are being implemented and executed through a partnerships approach with the Nairobi Convention Secretariat being the executing agency. SAP implementation happens through various forms of partnerships and specific priority projects<sup>21</sup> and an important partner to identify and engage with is the private sector.<sup>22</sup>

Together with a wide range of partners<sup>23</sup> the contracting parties of the Nairobi Convention entered into the Partnership for Implementing SDG 14 in the Western Indian Ocean with the following objectives:

1. Implementation of the strategic action programme to reduce impacts from land-based sources and activities and sustainably manage critical coastal and marine ecosystems through implementation of the agreed priorities.

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<sup>17</sup> United Nations Environment Program <https://www.unenvironment.org/nairobiconvention/who-we-are/protocols>

<sup>18</sup> United Nations, General Assembly (2018). *Proposed work programme for the period 2018–2022 for the implementation of the Nairobi Convention: Note by the Secretariat*. 8 August 2018. UNEP/EAF/CP.9/2/Rev.1

<sup>19</sup> United Nations, General Assembly (2018). *Proposed work programme for the period 2018–2022 for the implementation of the Nairobi Convention: Note by the Secretariat*. 8 August 2018. UNEP/EAF/CP.9/2/Rev.1 (2B 31 (i) page 7.

<sup>20</sup> Most of the LME mechanisms in place are projects supported by the Global Environment Facility (GEF). Because LMEs cover large territorial areas, they involve various stakeholders at different levels with various thematic subjects. LME projects follow procedural steps and make use of both Transboundary Diagnostic Analysis (TDA) and a Strategic Action Programme (SAP).

<sup>21</sup> United Nations (2018). *GEF LME: Large Marine Ecosystems Strategic Approach Toolkit*. Paris <https://iwlearn.net/resolveuid/7699de40-3ee5-41f1-80d8-ec64333758c7>

<sup>22</sup> United Nations Environment Programme (2016). Project Document [https://www.thegef.org/sites/default/files/project\\_documents/04-04-16\\_Project\\_Document\\_PAD.pdf](https://www.thegef.org/sites/default/files/project_documents/04-04-16_Project_Document_PAD.pdf)

at 37

<sup>23</sup> See <https://oceanconference.un.org/commitments/?id=18313> for more information

2. Implementation of the Western Indian Ocean strategic action programme on policy harmonization and institutional reforms towards improved ocean governance and transition to a low carbon pathway.
3. Sustainable management of shared fish resources and collaborative management of marine and coastal resources in the Northern Mozambique Channel.
4. Improved governance of areas beyond national jurisdiction to promote the blue economy pathways in the Western Indian Ocean Region.

Another relevant regional association is the Indian Ocean Rim Association (IORA). In 2017 member states signed the Joint Declaration on the IORA Business Community to Build Partnerships for a Sustainable and Equitable Economic Growth, emphasising the importance of enabling and leveraging the private sector's role in driving sustainable development. The Indian Ocean Rim Business Forum (IORBF) is IORA's private sector arm. IORA ministers and officials rely on advice from IORBF on business matters as well as ways to improve intra-regional trade and ways to increase Foreign Direct Investment flows in the Indian Ocean region.

This section of the assessment report examines the existing global and regional strategies, programmes and national policies, acts, legislations and regulatory frameworks that promote private sector in LME management and conservation.<sup>24</sup>

### **3.2 Hard Law: International Legal Instruments**

International legal instruments may not necessarily include explicit reference to private sector engagement relating to LME management and conservation, but they set out the basis for future national legislation, decisions, agreements and engagements.

While the 1982 United Nations Convention on the Law of the Sea (UNCLOS) provides an overarching framework of rights and duties, there are a number of other international agreements that are concerned with particular uses and/or specific regions or sub regions of the sea, for example various shipping conventions adopted under the auspices of the International Maritime Organization (IMO), conventions and action plans adopted by the United Nations Environmental Programme (UNEP) and the Regional Seas Programme, the wide array of Multi-lateral Environmental Agreements (MEAs) and the Regional Fisheries Management Organisations (RFMOs).<sup>25</sup>

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<sup>24</sup> A very important source of information is the GEF/UNDP Trans Boundary Legal Frameworks Best Practices Project provided on a pro bono basis to this Portfolio Learning project [http://content-ext.undp.org/aplaws\\_publications/3247154/IW\\_Review\\_of\\_Legal\\_Instrl\\_Frameworks\\_Project\\_Report.pdf](http://content-ext.undp.org/aplaws_publications/3247154/IW_Review_of_Legal_Instrl_Frameworks_Project_Report.pdf)

<sup>25</sup> There are three types of RFMOs: General RFMOs, Tuna RFMOs, and Specialised RFMOs.

The **UNCLOS** aims for a balance between the sovereign right of States to exploit their natural resources in accordance with their environmental policies, and their obligation and duty to protect and preserve the marine environment within various maritime zones.<sup>26</sup> It also provides fundamental principles and duties of ocean conservation. Various strategies, programmes and policies that promote private sector engagement in LME or marine ecosystem management and conservation rely on the UNCLOS principles and obligations.

A new legally binding instrument is currently being negotiated under the UNCLOS that will regulate the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ). LME projects, which follow predominantly a science-based ecosystem approach, can contribute science and management expertise towards the management of BBNJ.<sup>27</sup>

In the same way in which the UNCLOS provides an overarching framework for ocean governance, other international legal instruments, conventions and treaties, provide a framework for specific uses of the marine environment. Key relevant international treaties are listed in Annex A and some examples of provisions supporting private sector engagement within these instruments are described below.

The IMO Conventions provide a comprehensive regulatory framework for maritime safety, and marine environmental protection, with various relevant examples of projects supporting private sector engagement discussed in chapter five of this report.

In addition to the Nairobi Convention, the UN Environment Programme hosts various MEAs and has partnered with the private sector through various projects and initiatives. There has been a general indication in various MEAs, including for example the Abidjan Convention,<sup>28</sup> acknowledging and calling for the need to advance the relationship with the private sector. This includes, amongst other things, agreeing to more inventive approaches to promoting private sector sustainability, transformation and the leveraging of their technical proficiency and financial resources. Building on the United Nations Framework Convention on Climate Change (UNFCCC) the Paris Agreement requires parties to submit Nationally Determined

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<sup>26</sup> UNCLOS Article 192 and 193, [https://www.un.org/depts/los/convention\\_agreements/texts/unclos/unclos\\_e.pdf](https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf).

<sup>27</sup> United Nations (2018). GEF LME: Governance Toolkit at 9 <https://iwlearn.net/resolveuid/53e8e16c-0a48-4071-8f14-5e822141177b>

<sup>28</sup> Convention on Biological Diversity (CBD); Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Convention on the Conservation of Migratory Species of Wild Animals (CMS), its regional and species related agreements; Basel, Rotterdam and Stockholm Conventions (BRS); Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer; Minamata Convention on Mercury; Bamako Convention on the ban on the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa; Barcelona Convention Coordinating Unit for the Mediterranean Action Plan; Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean (Nairobi Convention) and its protocols; and Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention)

Contributions (NDCs). It is widely acknowledged that private sector engagement is crucial to the implementation of countries' NDCs.

Older conventions also have good examples of involving the private sector. **The Bonn Convention on Migratory Species (CMS), 1994**, has adopted various Memoranda of Understanding (MoU) that refer to private sector engagement. An example is the Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of the Indian Ocean and South-East Asia (IOSEA Marine Turtle MOU). One of the specific activities to promote the implementation of the MoU is to approach the private sector, foundations and NGOs with a possible interest in funding activities in particular countries to catalyse the creation of small grants funds.<sup>29</sup>

Other important intergovernmental agreements within the WIO region include the **Indian Ocean Tuna Commission (IOTC)** a tuna RFMO, and the **Southern Indian Ocean Fisheries Agreement**, a non-tuna regional fisheries agreement that operates within the high seas.

### 3.3 Soft Law Instruments

The **Rio+20 Outcome Document “The Future We Want”**, calls on the international community to take urgent action to ensure the sustainable management of issues such as diminishing fish stocks; the destruction of marine and coastal habitats, the uncontrolled spread of invasive alien species, and the increase in ocean acidification; and to protect marine biodiversity, especially in areas outside the jurisdiction of various States.<sup>30</sup> The document also calls on the international community to strengthen its collaboration around the development and implementation of ecosystems approaches for effective management of marine ecosystems, so as to contribute to globally agreed targets, such as **Aichi Biodiversity Targets 6, 10, and 11**<sup>31</sup> and the International **Coral Reef Initiative (ICRI)** Call to Action. It recognises that the **UN Secretary General's Oceans Compact** is an important framework to assist in efforts by all stakeholders (including UN Agencies, International Financial Institutions (IFIs),

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<sup>29</sup> Available at [https://www.cms.int/sites/default/files/instrument/mou\\_cmp\\_2009\\_e.pdf](https://www.cms.int/sites/default/files/instrument/mou_cmp_2009_e.pdf)

<sup>30</sup> United Nations Environment Programme <https://www.unenvironment.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/strategy>

<sup>31</sup> Strategic Plan for Biodiversity (2011 – 2020) includes 20 targets known as the Aichi Biodiversity Targets

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

civil society and the private sector) to coordinate and manage the protection of the marine and coastal environment.

### 3.4 Financial Mechanisms

The **Global Environmental Facility (GEF)** serves as a financial mechanism for various multilateral environmental agreements. The GEF plays a crucial role in the sustainable development of LMEs and has supported activities in 17 LMEs thus far. Together with intergovernmental organizations, such as the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP), the GEF has supported numerous LME projects. Its **International Waters (IW)** focal area, with the specific mandate to support transboundary cooperation in shared marine and freshwater ecosystems, finances and facilitates the development of transboundary SAPs. Part of the IW is the **IW: LEARN**, an exchange and resource network established to improve transboundary water management and it includes the LME: Learn. The LME: Learn is a GEF-UNDP-IOC/UNESCO project focused on enhancing global ecosystem-based governance of LMEs and their coasts, via developing knowledge and capacity, uniting the efforts of public and private partners, and facilitating south-to-south and north-to-south learning. One of the main components of the project is to support ongoing collaboration between LME, MPA, and ICM projects in overlapping areas, both for GEF and non-GEF projects. The overall goal of this comprehensive project is to achieve a multiplier effect by sharing with practitioners and other key stakeholders, lessons learned and resources used.<sup>32</sup>

In 2018 the Government of the Seychelles launched the Seychelles Blue Bonds, a fixed income investment issued on the agreement to use proceeds raised to contribute towards marine protection, fishery management and other projects and activities to protect and support the blue economy.

Other donor mechanisms supporting the conservation of LMEs include the French Facility for Global Environment (FFEM), the Green Climate Fund (GCF), and the EU. Other partners with regional and LME approaches include various development agencies, for example SIDA, NORAD, and BMZ. NORAD for instance funded the IMO Marine Environment Protection of the South East Asian Seas (MEPSEAS) project. This project focused on the implementation of three IMO Conventions in the region and convened training for both national and private sector stakeholders on the national implementation of the relevant conventions.

Market-based mechanisms, such as Payment for Ecosystem Services (PES), further enables private sector engagement. One of the planned outcomes of the SAPPHIRE programme is to

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<sup>32</sup> United Nations (2018). *GEF LME: Governance Toolkit* at 9 <https://iwlearn.net/resolveuid/53e8e16c-0a48-4071-8f14-5e822141177b>. The IW: Learn also serves as an important portal for information: <https://iwlearn.net/documents/experience-notes>.

support pilot studies on ecosystem goods and services and to deliver cost benefit analyses at both national and regional level, including financial mechanisms such as PES.<sup>33</sup>

One of the main mechanisms of engaging the private sector is corporate social responsibility (CSR). Certain countries have voluntary mechanisms in place while others have national legislation stipulating that companies must spend a certain percentage of their profits on CSR. It is important to access these opportunities and to encourage ocean industries to invest in the LME approach. Country examples of CSR are discussed in section 3.6 of this assessment report.

Private foundations are another financial mechanism for catalysing private sector engagement. An example is the MacArthur Foundation which has funded the project on designing a regional network for the WIO Local Fisheries Management and implemented by WIOMSA, WCS, Conservation International, CORDIO, WWF and Blue Ventures.

Another approach is tourism conservation levies. In Mozambique, for example, the Vilanculos Coastal Wildlife Sanctuary imposes a tourist levy and visitors fees which accrue in a Community Development Fund.

A detailed overview of resource mobilization options is provided in Annex C.

### 3.5 Regional Institutions and Civil Society Organizations

There is a significant presence of regional and sub-regional institutions and organisations within the WIO region with legal mandates and/or protocols on natural resource management and ocean governance.

**Regional Economic Communities (RECs) and Commissions** are important partners in the protection of marine and coastal environments. The African Union appointed RECs as the focal points to develop initiatives under Agenda 2063: The Africa We Want. In 2017 the Nairobi Convention was requested by the **African Ministerial Conference on the Environment (AMCEN)**, which has the mandate to advocate for environmental protection in Africa, to enter a cooperative agreement with regional bodies to improve the application of ecosystem-based management approaches. This resulted in a regional meeting held in South Africa in April 2019 with the four RECs with a mandate in the WIO – these included, **Common Market for Eastern and Southern Africa (COMESA)**, the **East African Community (EAC)**, the **Intergovernmental Authority on Development (IGAD)** and the **Southern African Development Community**

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<sup>33</sup> Available at:

<http://nairobi-convention.org/Meeting%20Documents/June%202019/SAPPHIRE%20Project%20Steering%20Committee%20Meeting/WIOLME%20SAPPHIRE%20Project%20AWP%202019%20Final%2012022019.pdf>

(SADC). Other Commissions and partners that attended were **Southwest Indian Ocean Fisheries Commission (SWIOFC)**.

Other organisations include the **Indian Ocean Commission (IOC-COI)**, **Indian Ocean Tuna Commission (IOTC)**, **Port Management Association of Eastern and Southern Africa (PMAESA)**, and **Western Indian Ocean Marine Science Association (WIOMSA)**. One of the identified collaboration opportunities between the Nairobi Convention and the RECs and Commissions is with the SAPPHIRE project, in order to support countries in policy harmonization and capacity building.<sup>34</sup>

AMCEN also led the process for the development of the action plan for the Environment Initiative for the **New Partnership for Africa Development (NEPAD)** and endorsed a framework, “NEPAD Environment Action Plan”, which commenced in 2002 and a policy framework and reform strategy for fisheries and aquaculture in Africa.<sup>35</sup>

The **African Ministers’ Council on Water (AMCOW)** is a regional inter-governmental body responsible for promoting cooperation among Member States around the sustainable management and use of water resources and the preservation of ecosystems in the region. Through its focus on water affairs and actions in the region, it promotes cooperation, security, and socio-economic development. The Africa EU Water Partnership Project (AEWPP) is jointly implemented by the European Union, Sweden and AMCOW. The project is funded by the Swedish International Development Cooperation Agency (SIDA) and the aim of this project is to reduce hurdles to capital-flow for water-related infrastructure projects across Africa.

The countries in cooperation with the Inter-governmental Oceanographic Commission of **UNESCO-IOC** have created an IOC sub-commission for Africa and the Adjacent Island States. The IOC Sub-Commission for Africa and Adjacent Island States is an inter-governmental subsidiary body of UNESCO-IOC, which is responsible for the promotion of regional and international cooperation, and the development and coordination of the Commission’s marine scientific and research programmes, ocean services, ocean observing systems, capacity development, and related activities in the region, by taking account of the specific interests and priorities of Member States from Africa.

The **WIOMSA** is a non-governmental and non-profit regional organization which promotes the educational, scientific and technological development of marine science throughout the WIO region. Among its flagship programmes are the Marine Science for Management Programme (MASMA); several marine scientific symposia (notably the WIO Marine Science Symposium);

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<sup>34</sup>United Nations Environment Programme <https://www.unenvironment.org/nairobiconvention/news/blogpost/regional-economic-communities-recs-and-commissions-western-indian-ocean-region>

<sup>35</sup>African Union Commission (2014) *Policy Framework And Reform Strategy For Fisheries And Aquaculture In Africa* available at [https://au.int/web/sites/default/files/documents/30266-doc-au-ibar\\_-\\_fisheries\\_policy\\_framework\\_and\\_reform\\_strategy.pdf](https://au.int/web/sites/default/files/documents/30266-doc-au-ibar_-_fisheries_policy_framework_and_reform_strategy.pdf); Examples of older projects include the Strategic Partnership for Fisheries Investment Fund (SPFIF) which was funded by the GEF, executed by the World Bank and implemented by the African Union InterAfrican Bureau for Animal Resources (AU – IBAR), more info available at <https://www.au-ibar.org/spfif-about>



the publication of the WIO Journal of Marine Science; and joint initiatives on the Jakarta Mandate for Implementation of the 1992 Biodiversity Convention. WIOMSA has MOUs with the UNEP, the Wildlife Conservation Society, the Coastal Resource Centre of the University of Rhode Island, and the IOC - COI. WIOMSA is also a Scientific Partner of the Centre for Biological Diversity (CBD), and an active member of the WIO-C.

In addition to WIOMSA a number of regional and international civil society organizations are active in implementing multi-stakeholder partnerships, including IUCN, WWF, Birdlife International, The Nature Conservancy, International Ocean Institute, TRAFFIC, Conservation International, and CORDIO.

### 3.6 National Situation

The WIO countries all have national legislation that provides for coastal and marine management and a multitude of projects exists. Some of these projects are listed in Annex B.

Mauritius was the first country in the world to regulate CSR.<sup>36</sup> In terms of the amended Income Tax Act 1995, corporate bodies in Mauritius are required to operate a CSR fund. The act determines that all companies must contribute 2% of their profitable income as CSR. In 2017 a National CSR Foundation (NCSR) was set up to enhance coordination and transparency. The private sector also contributes through coastal hotels and boarding houses paying an environmental protection fee of 0.85% of their annual turnover

In the Seychelles, the Minister of Finance, Trade and Investment introduced the Corporate Social Responsibility Tax in 2013, amended in 2019. The Seychelles Revenue Commission (SRC) collects 0.5 percent on monthly turnover for businesses with an annual turnover of SCR 1 million. The environment, waste as well as coastal management projects are areas covered under CSR in the Seychelles.

In Mozambique CSR is predominantly motivated by the needs of a specific company rather than coordination through public authorities and it is the big projects that have professional CSR departments and budgets. In the mining sector national legislation has made a CSR component compulsory in 2014.<sup>37</sup>

In South Africa, the term Social Corporate Investment (CSI) is more commonly used than the term CSR. While national legislation does not compel companies to undertake CSR/CSI, policy documents and the King Reports on Corporate Governance, indirectly introduced CSR. In more recent years companies score points for socio-economic development (SED) on the basis of the CSR contributions that business makes as prescribed by the Broad-Based Black Economic Empowerment Act of 2003 (BBBEE Act). This means that certain CSR efforts are a

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<sup>36</sup> Pillay, R. (2015) *The Changing Nature of Corporate Social Responsibility: CSR and Development – The Case of Mauritius* 245.

<sup>37</sup> Kaufmann, F., Simons-Kaufmann, C. (2016) *Corporate Social Responsibility in Sub-Saharan Africa – Corporate Responsibility in Mozambique*

result of compliance with the BBBEE legislation. Companies have also developed their own CSR policies. An example is the Oceana Group whose CSI initiatives focus predominantly on supporting food security and education. In 2019 their CSI investment in South Africa amounted to R6.83 million.

In Tanzania formal consultation between the public and private sectors takes place under the auspices of the Tanzania National Business Council (TNBC). The TNBC established the Local and International Investors' Round Tables which consist of members from the Government, local private business and representatives of foreign investors. Tanzania also has the Public-Private-Partnership Act, 2010, which provides an institutional framework for the implementation of public private partnership agreements between the public and private sector entities and rules, guidelines and procedures which govern public private partnership procurement as well as the development and implementation of public private partnerships. The Tanzania Investment Centre (TIC) coordinates projects within the scope of this act. Recent legislation includes provision for CSR contributions. Of particular relevance to the extractives industry is the 2017 Mining Act which requires licenced mining companies to pay 0.07% of their gross revenues as CSR to local councils in their areas of operation.

### **3.7 Forums**

Forums include Global Fish Watch, United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-Economic Aspects (the UN Regular Process), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the International Council for Exploration of the Seas (ICES).

The 4<sup>th</sup> Conference of the Parties of the Nairobi Convention established the Forum of Heads of Academic and Research Institutions in the Western Indian Ocean (FARI) in 2004 to facilitate the establishment of a network of academic and research institutions in the region.

## **4. Key Maritime Sectors: Stakeholder Mapping and Review of Environmental Impacts**

### **4.1 Fisheries**

#### **4.1.1 Capture Fisheries**

##### **4.1.1.1 Sector Overview**

The warm waters of the Western Indian Ocean support diverse and commercially important fisheries. Though not characterized by the high-volume fisheries characteristic of nutrient rich cold water upwelling systems such as that found in the Benguela current, the fisheries of the Western Indian Ocean represent an important source of livelihoods and income for thousands of fishers, while fish is an important export product for many countries in the region.

Fisheries are broadly divided into artisanal and industrial sectors. In the WIO region, artisanal fisheries encompass a large number of different fishing gears (gillnets, cast nets, hand- and longlines, various forms of traps, etc). It should further be noted that artisanal fishing is highly varied in level of complexity and capital intensiveness, for example, the sector includes activities such as shore-based harvesting of molluscs (an activity dominated by women fishers), net or hook and line fisheries conducted from small dugout craft that can travel only a few miles from shore, and larger dhows or more modern craft powered by outboard engines that can travel further out to sea and make larger catches. These fisheries also vary considerably in the extent to which they are driven by subsistence or commercial objectives. Though categorised as artisanal or small scale, the capture volume of these fisheries can be significant, they are often tied to sophisticated local and regional value chains, they support the livelihoods of thousands of people and their activities can have important environmental impacts (e.g. blast fishing). Octopus fisheries in the region, for example, are typically carried out by fisheries using rudimentary traditional gears, yet their catches are processed to high standards and exported to international markets. Due to the informal nature of many artisanal fisheries, the total number of fishers engaged in this sector is difficult to estimate, though for most WIO countries it is clearly significant. For example, in Mozambique it is estimated that about 280 000 people are involved in artisanal fisheries. It should be noted that for certain countries in the region, notably Kenya and Tanzania, a significant proportion of artisanal fisheries are based inland and therefore focus on freshwater, rather than marine resources (e.g. Lake Victoria fisheries). For example, Kenya is estimated to have about 145 000 artisanal fishers, yet only about 13 000 of these fishers operate in the coastal zone.

The most important industrial fisheries in the WIO region are those for tunas and other large pelagic species (e.g. swordfish and sharks) and prawn fisheries. A review of offshore fisheries of the Southwest Indian Ocean<sup>38</sup> identified five broad categories of commercial fisheries, namely:

1. **Crustacean shallow-water trawl fisheries:** Significant for several WIO countries (Madagascar, Mozambique, Kenya, Tanzania), with a small fishery in South Africa. The main target species in all five countries are *Penaeus indicus* (commonly referred to as the Indian White Prawn) and *Metapenaeus Monoceros* (commonly referred to as the Speckled Prawn). Bycatch levels are very high – in 2004 it was estimated that the total

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<sup>38</sup> Available at:

[https://www.researchgate.net/publication/8130591\\_Fish\\_fishers\\_and\\_fisheries\\_of\\_the\\_Western\\_Indian\\_Ocean\\_Their\\_diversity\\_and\\_statuses\\_A\\_preliminary\\_assessment](https://www.researchgate.net/publication/8130591_Fish_fishers_and_fisheries_of_the_Western_Indian_Ocean_Their_diversity_and_statuses_A_preliminary_assessment)

regional catch of prawn is 24 000 tonnes, with bycatch volumes of 80 000 to 100 000 tonnes. Most of the bycatch is killed in the trawling process. Excepting for South Africa, the prawns are exported and are a valuable source of foreign currency. Also excepting for South Africa, there are substantial artisanal fisheries which appear to be growing and increasingly targeting prawns, causing user-conflicts with the trawl sector; user-conflicts are exacerbated by the trawlers discarding large amounts of bycatch species, some of which form part of artisanal fisheries' catches.

2. **Crustacean deep-water trawl fisheries:** Deep-water bottom trawl fisheries for crustaceans in the SWIO are industrial in nature, and operate at depths of 200- 600m (sometimes to 800m) to catch a mixture of high-value crustacean species. Target species vary by depth and area, but generally consist of deep-water knife (or pink) prawns (*Haliporoides triarthrus*), several other deep-water prawns (*Aristeus virillis*, *A. antennatus*, *Aristaeomorpha foliacea*, and *Plesiopenaeus* and *Heterocarpus* spp.), langoustines (*Metanephrops mozambicus*), deep-water lobsters (*Palinurus delagoae*) and deep-sea crabs (*Chaceon macphersoni*). Known trawling grounds for deep-water crustaceans are restricted to eastern South Africa (approx 1,750 km<sup>2</sup>), Mozambique (15,000 km<sup>2</sup>), Madagascar (small enclaves along the west coast), Tanzania (between Mafia Island and Zanzibar) and Kenya. Well established fisheries exist only in Mozambique and South Africa, and in Madagascar and Tanzania trawling in the deep waters appears to be occasional, limited to a few vessels, and usually short-lived.
3. **Crustacean deep-water trap fisheries:** These fisheries are of limited commercial importance. Several exploratory fisheries have been authorised, but either did not identify commercially-viable stocks or quickly exhausted such stocks. but quickly overfished or not of commercial quantities. Deep-water trap fisheries in the Southwest Indian Ocean (SWIO) catch spiny lobsters (*Palinurus* spp.), slipper lobsters (*Scylarides elisabethae*) and deep-sea crabs (*Chaceon macphersoni*). A trap fishery for *P. gilchristi* off southern South Africa has been active since 1974, and produces 700-1,000t of lobster per year for export.
4. **Pelagic fisheries:** Tunas and billfish (swordfish, marlins, sailfish) are considered to be highly migratory stocks, which are shared by the different countries of the region. These stocks are primarily exploited by industrial surface purse seine and long-line fisheries, and data on catches and fishing effort are reported to the Indian Ocean Tuna Commission (IOTC). Distant water fleets dominate purse-sein and longline fisheries for tunas and tuna-like species in the region. Most of the region's catch is landed in Seychelles, which hosts one of the largest tuna canning factories in the world; significant catches are also landed in Mauritius, South Africa and Madagascar. There has been increasing focus in recent years on promoting greater value addition of tuna catches within the region to strengthen the contribution of this fishery to regional economic development. The target species in the Indian Ocean were initially the highly valuable tuna for the Asian and global sashimi markets including yellowfin (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) as well as the albacore, also called

longfin, tuna (*Thunnus alalunga*) and the broadbill swordfish (*Xiphias gladius*). Further, as in all other tropical oceans, the smaller tunas are targeted using large purse seine vessels, in particular skipjack (*Katsuwonus pelamis*) and kawakawa (*Euthynnus affinis*). The fishery for these pelagic species has changed in recent years as stocks of the preferred species have declined and increasing fishing pressure has been put on the many lesser known pelagic species, including mackerels, billfishes and shark.

5. **Demersal fisheries:** In the WIO region, demersal catches consist of almost 600 species, few of which are adequately studied. Several fishing sectors in the region catch demersal species, including industrial, semi-industrial and small-scale artisanal fisheries. More specifically, these sectors consist of:
- Shallow-water trawling (less than 100m depth) – targeting either demersal fish or crustaceans with a demersal fish bycatch;
  - Linefishing – including deep-water dropline/longline (200-400m depth) targeting deepwater snappers and associated species;
  - Conventional linefishing, mainly handline, less than 200m depth, targeting a range of reef-associated fishes and predominantly artisanal and recreational.

Analysis of demersal fisheries in the WIO region carried out through the Southwest Indian Ocean Fisheries Project (SWIOFP) indicated that demersal fish stocks to have been subjected to heavy fishing pressure, with most of the priority species for which stock assessments were carried out found to be fully- or overexploited. However, some signs of recovery under management were noted. Annual catches of 13 key species generally declined, and in some instances, stable or increasing total catch could be due to a shift in fishing grounds following localized stock depletion. While all the countries have some form of management in place, few of the priority species are explicitly covered in these plans, especially considering the transboundary nature of these species.

In addition to the fisheries outlined above there are a range of nearshore fisheries targeted by small scale fishers as well as industrial fisheries. The WIOFish project has identified at least 239 different types of fisheries that operate in the coastal zone.<sup>39</sup> These include activities such as coral harvesting and the harvesting of sea cucumber. Demand for sea cucumber is high in Asian markets and most WIO countries have sea cucumber populations targeted by small scale fishers. A review of the region's sea cucumber fisheries published in 2013 concluded that sea cucumber fisheries in most of the region's countries continued to decline due to overexploitation and persistent and systemic governance challenges.<sup>40</sup>

#### 4.1.1.2 Key Stakeholders

Table 3: Key Stakeholders – Capture Fisheries

<sup>39</sup> Available at: [http://www.wiofish.org/portal/wiofishdb/UserFiles/SysDocs/bb\\_content/10000/7/Biennial%20Report%202016-17.pdf](http://www.wiofish.org/portal/wiofishdb/UserFiles/SysDocs/bb_content/10000/7/Biennial%20Report%202016-17.pdf)

<sup>40</sup> Available at:

[https://www.researchgate.net/publication/274834193\\_Sea\\_cucumbers\\_in\\_the\\_western\\_Indian\\_ocean\\_Improving\\_management\\_of\\_an\\_important\\_but\\_poorly\\_understood\\_resource](https://www.researchgate.net/publication/274834193_Sea_cucumbers_in_the_western_Indian_ocean_Improving_management_of_an_important_but_poorly_understood_resource)

Main categories	Illustrative Examples*
Regional fisheries commissions and associations	<ul style="list-style-type: none"> <li>▪ Indian Ocean Tuna Commission</li> <li>▪ South West Indian Ocean Fisheries Commission</li> <li>▪ Southern Indian Ocean Deepsea Fishers Association</li> <li>▪ Global Tuna Alliance</li> </ul>
National industrial fisheries associations	<ul style="list-style-type: none"> <li>▪ South Africa Deep-sea Trawling Industry Association</li> <li>▪ Tanzania Industrial Fishing and Processors Association</li> <li>▪ Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar (GAPCM) / Shrimp Fishing and Aquaculture Association of Madagascar</li> </ul>
Small-scale / artisanal fisheries associations (including beach management units)	<ul style="list-style-type: none"> <li>▪ MIHARI network (Madagascar)</li> <li>▪ Seychelles Fishing Boat Owners Association</li> <li>▪ Dar es Salaam Small-Scale Fishers' Association (UWAWADA)/Umoja wa Wavuvi Wadogowadogo</li> <li>▪ Fédération des Pêcheurs Artisans de l'Océan Indien (Regional Network of Artisanal Fisherfolk Organisations of the Indian Ocean)</li> </ul>
Research (including public research institutions)	<ul style="list-style-type: none"> <li>▪ ORI</li> <li>▪ Rhodes University</li> <li>▪ KMFRI</li> <li>▪ TAFIRI</li> <li>▪ Seychelles Fishing Authority</li> </ul>

#### 4.1.1.3 Environmental Impact

The key impacts of capture fishing on coastal and marine ecosystems include:

- Overexploitation of the fish stocks themselves and the consequential impacts;
- Impacts on non-target species – including endangered, threatened and protected species - through bycatch and discards; and
- Habitat degradation as a consequence of destructive fishing methods.

#### Overexploitation

In most cases, there is not sufficient information to thoroughly assess the status of WIO fish stocks. However, the IOTC in its status summary for IOTC fisheries in 2018 identified a number of pelagic species to be overfished and/or subject to overfishing.<sup>41</sup> These included the Yellowfin tuna, Blue marlin, Striped marlin and Indo-Pacific sailfish, with concerns also being expressed regarding the Longtail tuna, and Narrow-barred Spanish mackerel.<sup>42</sup>

<sup>41</sup> See also <http://www.fao.org/3/ca7501b/CA7501B.pdf>

<sup>42</sup> See <https://www.iotc.org/documents/reporting-fisheries-statistics-2018-iotc>

Furthermore, Heileman et al (2015)<sup>43</sup> reported that demersal fish stocks were subject to heavy fishing pressure and that the stock assessments of priority species showed that they were all fully- or overexploited.

Overexploitation is of concern not only in terms of its potential impact on people's food security, but also because overexploitation of key species in an ecosystem can affect the trophic balance. For example, overfishing of triggerfish in Kenya affected the predator-prey relationships leading to an explosion of sea urchins which then overgrazed the seagrass beds, which in turn led to the erosion of coral reefs.<sup>44</sup>

Similarly, tropical seabirds tend to forage in association with tuna species where the tuna drive prey to the surface thus making them more accessible to the seabirds. The overexploitation of tuna stocks in the WIO could therefore lead to a loss of foraging opportunities for seabirds such as tropic birds, boobies, frigate birds and terns (especially Sooty terns) with potentially significant impacts on their populations.<sup>45</sup>

## Bycatch

The term bycatch has various definitions, but is taken here to be all non-target species – both those which are retained for sale or consumption as well as those which are discarded. This includes megafauna such as marine mammals, seabirds, turtles, elasmobranchs and fish some of which are Red Listed. In the WIO, bycatch is, in fact, regarded as the biggest threat to marine mammals – including the endangered dugong,<sup>46</sup> turtles (three of which are endangered, including the Loggerhead, Green, and Hawksbill turtles),<sup>47</sup> and seabirds.<sup>48</sup>

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<sup>43</sup> Heileman, S., Fennessy, S.T. and van der Elst, R.P. (2015). Demersal fisheries: A retrospective analysis of their status in the Southwest Indian Ocean. In Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research)

<sup>44</sup> Laipson and Pandya 2009 – quoted in the RSOCR, 2015: <https://researchspace.csir.co.za/dspace/handle/10204/9150>

<sup>45</sup> D. K. Danckwerts D.K, McQuaid C.D., Jaeger A., McGregor G.K., Dwight R., Le Corre M., Jaquemet S., Biomass consumption by breeding seabirds in the western Indian Ocean: indirect interactions with fisheries and implications for management, *ICES Journal of Marine Science*, Volume 71, Issue 9, November/December 2014; Wanless, R. (2015). Seabirds: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean. In Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>46</sup> Kiszka, J. (2015). Marine mammals: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean In Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>47</sup> Bourjea, J. (2015). Sea turtles: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean. In Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species (eds. R.P. van der Elst and B.I. Everett). Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>48</sup> Wanless, R. (2015). Seabirds: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean. In Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

In a review of fisheries in the SWIO region, bycatch was shown to occur in all fishery types although it was generally lower in recreational, artisanal and subsistence fisheries – where harvesting is more selective - than is in semi-industrial and industrial fisheries, including fishing by foreign fleets. However, the level of bycatch also depends on the fishing method. Prawn trawling, for example, is undertaken by artisanal and industrial fishers and has a very diverse bycatch often exceeding 70% of the catch. There are also some artisanal/subsistence fisheries using illegal non-selective fishing methods such as drag nets which are likely to have a higher bycatch.<sup>49</sup>

Bycatch of megafauna has been quite widely reported in both small-scale and industrial fisheries in the WIO and/or IOTC Area. Examples include:

- Temple et al (2019)<sup>50</sup> assessed the megafauna bycatch for small-scale fisheries using hand lines, longlines, bottom-set and drift gillnets based on landings at sites in Kenya, Zanzibar and northern Madagascar. Species identified included sea turtles, cetaceans, dugong, rays and sharks.
- Bottom-set gillnets and driftnets targeting large pelagic fish (including tuna) off Zanzibar have been reported as catching unsustainable levels of dolphins, while these nets are also known to have caught humpback whales. Pelagic longlines and purse-seines have also been implicated.<sup>51</sup>
- Although a series of Resolutions have been adopted by the Contracting Parties to the IOTC to ban the use of large-scale driftnets in the IOTC area, the most recent (2017) only requires them to be phased out by 1 January 2022. According to Anderson et al (2020)<sup>52</sup>, pelagic gillnets (driftnets), accounted for an average of 34% of total Indian Ocean tuna catch between 2012 and 2016 with non-tuna bycatch including large numbers of sharks, other finfish, turtles and cetaceans. The paper estimated that cetacean numbers in the Indian Ocean may have dropped by more than 80% in recent decades, with an estimated 100,000 cetaceans – mainly dolphins – caught in commercial gill nets in 2006, with current annual numbers at about 80,000.
- Industrial longline fisheries have high discard rates in some areas with sharks making up the bulk of the bycatch.<sup>53</sup>

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<sup>49</sup> Fennessy, S.T. and Everett, B.I. (2015). Fisheries bycatch: An updated assessment of the status in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>50</sup> Temple, A.J., Wambijib, N., Poonianc, CNS, Jiddawid, N., Steada, S.M., Kiszka, J.J., Berggren, P. (2019). Marine megafauna catch in southwestern Indian Ocean small-scale fisheries from landings data. *Biological Conservation* 230: 113–121.

<sup>51</sup> Kiszka, J., Per Berggren, Gill Braulik, Tim Collins, Gianna Minton & Randall Reeves (2017) Cetacean bycatch in the western Indian Ocean: a review of available information on coastal gillnet, tuna purse seine and pelagic longline fisheries. IOTC-2017 WPEB 13-40 Rev.1

<sup>52</sup> Anderson, R.C., Miguel Herrera, Anoukchika D. Ilangakoon, K. M. Koya, M. Moazzam, Putu L. Mustika, Dipani N. Sutaria (2020). Cetacean bycatch in Indian Ocean tuna gillnet fisheries. *Endang Species Res.* 41: 39–53, 2020. <https://doi.org/10.3354/esr01008>

<sup>53</sup> Kelleher, K. (2005). Discards in the world's marine fisheries: an update. Report No. 470. FAO, Rome



- Turtles commonly form part of the bycatch of gill-netting, demersal trawling and long-lining with high mortality rates. Species which are predominantly coastal – Green and Hawksbill – are mainly affected by trawlers, while those that are more pelagic are primarily impacted by longlines.<sup>54</sup>
- Purse seines are used in both small-scale and industrial fisheries with bycatch including a number of non-target fish and elasmobranchs.<sup>55</sup>
- Bycatch, especially from tuna longline fishing, is considered to be the greatest threat to seabirds in the WIO.<sup>56</sup>

## Habitat degradation

Fishing gear such as bottom trawls or dredges are widely acknowledged to cause physical damage to benthic habitats and the associated communities by altering the morphology of the seafloor, causing the suspension of sediments, increasing turbidity, changing nutrient cycles, and physically removing both target and non-target species.<sup>57</sup> However, the impacts of prawn trawling on benthos in the WIO have not been studied.<sup>58</sup> A study in Kenya found that a variety of fishing gears used by artisanal fishers – including traps, gill nets, beach seines, hand lines and spear guns – caused damage to coral reefs. Of these, beach seines had the biggest impact.<sup>59</sup>

An FAO/UNEP Expert meeting in 2009 defined destructive fishing practices as “the use of fishing gears in ways or in places such that one or more key components of an ecosystem are obliterated, devastated or ceases to be able to provide essential ecosystem functions.” The meeting identified the use of synthetic poisons, explosives and “coral bashing” as key examples.<sup>60</sup> It should be noted that the use of explosives in fishing (blast or dynamite

<sup>54</sup> Bourjea, J. (2015). Sea turtles: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research.

<sup>55</sup> Fennessy, S.T. and Everett, B.I. (2015). Fisheries bycatch: An updated assessment of the status in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>56</sup> Wanless, R. (2015). Seabirds: A review of status, distribution and interaction with fisheries in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>57</sup> Pusceddu, A., Bianchelli, S., Martin, J., Puig, P., Palanques, A., Masqué, P., Danovaro, R. (2014). Chronic and intensive bottom trawling impairs deep-sea biodiversity and ecosystem functioning. *Proceedings of the National Academy of Sciences*, 111 (24) 8861-8866. Doi: 10.1073/pnas.1405454111

<sup>58</sup> Fennessy, S.T. and Everett, B.I. (2015). Fisheries bycatch: An updated assessment of the status in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

<sup>59</sup> Mangi SC, Roberts CM. 2006. Quantifying the environmental impacts of artisanal fishing gear on Kenya’s coral reef ecosystems. *Marine Pollution Bulletin* 52, 1646-1660.

<sup>60</sup> FAO (2010). Report of the FAO/UNEP Expert meeting on impacts of destructive fishing practices, unsustainable fishing, and illegal, unreported and unregulated (IUU) fishing on marine biodiversity and habitats. Rome, 23–25 September 2009. *FAO Fisheries and Aquaculture Report*. No. 932. Rome, FAO. 2010. 32p.

fishing) has significantly decreased in the WIO region, this is particularly noteworthy in Tanzania, which was in the past a hotspot for dynamite fishing.<sup>61</sup>

The use of poisons in the WIO appears to be minimal although Fennessy and Everett (2015)<sup>62</sup> did report the use of explosives by small-scale fishers in the vicinity of coral reefs in some areas. This practice not only kills the target fish, but also kills non-target fish and invertebrates (bycatch) in the reef while also doing physical damage to the reefs. Dugongs and turtles were also reported to have been affected.

## 4.1.2 Mariculture

### 4.1.2.1 Sector Overview

Aquaculture has long been the fastest growing food production system in the world, with the sector growing at an average rate of 5.8% over the 2010-2017 period. In 2016, global aquaculture production stood at just over 80 million tonnes and was valued at USD 237.5 billion (farm-gate value). The sector employs close to 20 million workers directly and an additional 6.5 million indirectly. It is important to note, however, that these global figures are largely accounted for by production in the Asia-Pacific region, which accounts for over 90% of global aquaculture production.

Mariculture refers specifically to aquaculture production in marine or brackish environments. The FAO recorded 28.7 million tonnes (USD 67.4 billion) of food fish production from mariculture and coastal aquaculture combined in 2016. Here too, the Asia-Pacific region accounts for over 90% of production. Africa accounts for only a small percentage of total aquaculture production (0.4%) and this is even more pronounced for mariculture. Within the WIO region, mariculture is practiced in South Africa, Kenya, Mozambique, Madagascar, Réunion, Mauritius, Seychelles, Mayotte and Tanzania. Mariculture activities are most significant in Tanzania, South Africa, Madagascar and Mozambique. It should be noted, however, that in the case of South Africa most mariculture sites are on the country's south and west coasts, which falls outside the FAO statistical area 51 (Western Indian Ocean). Mariculture production volumes are dominated by seaweed aquaculture in Tanzania, which is well established. Smaller mariculture operations have been tested or developed for sea cucumber, crab, molluscs (including oysters) and finfish. In terms of value, South Africa's mariculture sector is dominated by abalone production, which has been expanded in recent

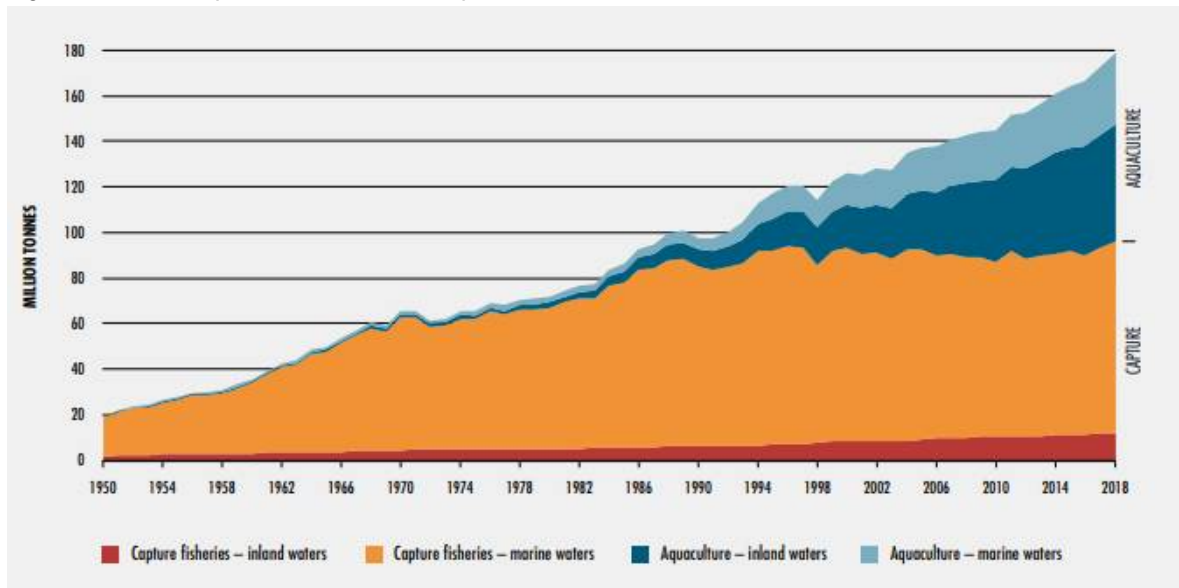
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<sup>61</sup> Available at: [https://rusi.org/sites/default/files/201911\\_whr\\_3-19\\_turning\\_the\\_tide\\_de\\_rivaz\\_web.pdf](https://rusi.org/sites/default/files/201911_whr_3-19_turning_the_tide_de_rivaz_web.pdf)

<sup>62</sup> Fennessy, S.T. and Everett, B.I. (2015). Fisheries bycatch: An updated assessment of the status in the Southwest Indian Ocean. In *Offshore fisheries of the Southwest Indian Ocean: their status and the impact on vulnerable species* (eds. R.P. van der Elst and B.I. Everett) Special Publication No 10. Durban: South African Association for Marine Biological Research

years under the *Operation Phakisa* programme. Enhanced government support to mariculture has also seen the development of finfish production, although production volumes remain low, while production of molluscs (mussels and oysters) has been established for longer yet similarly remain small. Prawn mariculture operations have been developed in the region (e.g. in Mozambique and Madagascar). Several states have also expressed interest in supporting expanded mariculture activities as part of national blue economy strategies (e.g. Seychelles).

Figure 1: World Capture Fisheries and Aquaculture Production



Source: FAO, State of World Fisheries and Aquaculture, 2020

Table 4: Aquaculture Production – World and Africa			
Category	Africa (thousand tonnes, live weight)	World (thousand tonnes, live weight)	Africa's production as % of world
<b>Inland aquaculture</b>			
Finfish	1893	46951	4.03%
Crustacea	0	3653	0.0%
Molluscs	0	207	0.0%
Other aquatic animals	0	528	0.0%
<b>Subtotal</b>	<b>1954</b>	<b>51366</b>	<b>3.80%</b>
<b>Marine and coastal aquaculture</b>			
Finfish	291	7328	3.97%

Crustacea	6	5734	0.10%
Molluscs	6	17304	0.03%
Other aquatic animals	0	390	0.00%
<b>Subtotal</b>	<b>302</b>	<b>30756</b>	<b>0.10%</b>
<b>All aquaculture</b>			
Finfish	2184	54279	4.02%
Crustacea	6	9387	0.06%
Molluscs	6	17511	0.03%
Other aquatic animals	0	919	0.0%
<b>Subtotal</b>	<b>2196</b>	<b>82095</b>	<b>2.67%</b>

Source: FAO, State of World Fisheries and Aquaculture, 2020

#### 4.1.2.2 Key Stakeholders

Main categories	Illustrative Examples*
Regional aquaculture associations	<ul style="list-style-type: none"> <li>▪ Aquaculture Association of Southern Africa</li> <li>▪ Africa Chapter of the World Aquaculture Society</li> </ul>
National aquaculture associations, including species-specific associations	<ul style="list-style-type: none"> <li>▪ Aquaculture Association of Tanzania</li> <li>▪ Marine Finfish Farmers Association of South Africa</li> <li>▪ Zanzibar Seaweed Cluster Initiative</li> <li>▪ Aquacultural Association of Kenya</li> </ul>
Individual operators	<ul style="list-style-type: none"> <li>▪ Indian Ocean Trepang</li> <li>▪ Lattice Aqua</li> <li>▪ Aquapesca</li> </ul>
Community and small-scale aquaculture organizations; and BMU/LMMA networks	<ul style="list-style-type: none"> <li>▪ Community Based Aquaculture in the WIO (regional network)</li> <li>▪ MIHARI (LMMA network, Madagascar)</li> </ul>
NGOs and donors supporting community-based aquaculture	<ul style="list-style-type: none"> <li>▪ Blue Ventures</li> </ul>
Aquaculture research networks	<ul style="list-style-type: none"> <li>▪ Research Network for Sustainable Marine Aquaculture in Africa (AfriMAQUA)</li> </ul>

#### 4.1.2.3 Environmental Impact

There is a wide range of potential environmental impacts from mariculture depending on the species farmed, the technology used, the site, the capacity for waste assimilation etc. Potential impacts include:

- Loss, modification or degradation of habitat (e.g. mangroves);
- Loss of productive fishing grounds;

- Depletion of wild feedstock;
- Alteration of community structure and trophic systems;
- Bycatch;
- Pollution e.g. organic waste products, antibiotics, disinfectants, antifouling agents and sediments;
- Spread of diseases to wild populations;
- Introduction of alien species;
- Aesthetic impacts may stimulate conflict with the tourism industry.

Relatively little information is available on the impacts of mariculture in the WIO region. However, several studies in Tanzania have shown that seaweed farming has environmental impacts, including:

- reduced seagrass, macroalgae and macrophytes;
- lower numbers of microorganisms; and
- reduced young seagrasses and macroalgae.<sup>63</sup>

In some areas, mangroves have been cleared for the construction of finfish ponds, while the wood has also been used in the construction of infrastructure for seaweed farming and cages for crab farming.<sup>64</sup> However, it is interesting to note that a proposal to develop a prawn farm in the Rufiji Delta (Tanzania) in the mid-1990's led to community protests on the strength of the potential impacts and the eventual abandoning of the project. Anticipated impacts included the destruction of 1,200 hectares of mangroves, including rare species such as *Rhizophora* as well as the habitats of a variety of endangered species, the generation of pollution which could cause eutrophication, toxicity, and acidification of surrounding water resources. It was also expected to affect the livelihoods of the Rufiji Delta villagers many of whom are small farmers and traditional fishers.

Chemicals and antibiotics are commonly used to control the outbreak of diseases in prawn farms.<sup>65</sup> While the environmental impact of these has not been assessed in the WIO, it is noted that there have been outbreaks of the White Spot Syndrome in prawn farms located in Quelimane, Mozambique in 2011, with a second outbreak at a semi-intensive prawn farm in the south-west of Madagascar 2012.<sup>66</sup> White spot syndrome is known to affect several crustacean species including penaeid shrimp and crabs. White Spot Syndrome is a major

<sup>63</sup> Available at: <https://link.springer.com/article/10.1007/s13280-020-01319-7>

<sup>64</sup> Regional State of the Coast Report: Western Indian Ocean (2015). UNEP.

<sup>65</sup> Gräslund, S. (2004). Chemical use in shrimp farming and environmental implications of antibiotic pollution. Department of Systems Ecology. Stockholm University, Stockholm.

<sup>66</sup> Responsible Aquaculture Foundation (2013). Case Study of the Outbreak of White Spot Syndrome Virus at Shrimp Farms in Mozambique and Madagascar: Impacts and Management Recommendations. Case Study #3 of a series entitled, "Lessons Learned in Aquaculture Disease Management". [http://www.gaalliance.org/cmsAdmin/uploads/raf\\_wssv-report2.pdf](http://www.gaalliance.org/cmsAdmin/uploads/raf_wssv-report2.pdf)

challenge to the sustainability of shrimp aquaculture in the WIO region, along with the challenge of achieving economies of scale in order to compete with large-scale producers in India, Indonesia, Thailand and Malaysia.

*E. denticulatum* and *Kappaphycus alvarezii* – the two seaweed species most commonly farmed in Tanzania - were imported from the Philippines in 1989.<sup>67</sup> *Kappaphycus* is well known for being invasive, and Conklin and Smith (2005)<sup>68</sup> reported that *Kappaphycus* spp. are able to grow over corals and thus pose a serious danger to coral reefs in Hawaii. This is of concern in the context of the increase in algal cover in coral reefs reported by Obura et al (2017)<sup>69</sup>.

### 4.1.3 Fish Processing and Trade

#### 4.1.3.1 Sector Overview

The majority of the catch of artisanal/small-scale fishers is sold at local markets for domestic consumption although a portion of this is “processed” – for example, by salting and drying.<sup>70</sup> In the case of some species – for example, sea cucumbers – the harvest is dried and packed for export. The seaweed which is cultured/collected – mainly by women - is also dried and then sold to exporters.

Seafood processing at an industrial scale is predominantly linked to industrial (or semi-industrial) offshore fisheries such as tuna and prawns which are destined for export. Exports include live, fresh, frozen and canned seafood products. There are, for example, tuna and/or prawn canning/processing facilities in Seychelles, Mauritius, Madagascar, Reunion, Kenya, South Africa and Tanzania. The tuna canning factory in Seychelles being one of the largest in the world.<sup>71</sup>

#### 4.1.3.2 Key Stakeholders

Table 6: Key Stakeholders – Fish Processing and Trade	
Main categories	Illustrative Examples*

<sup>67</sup> Msuya, F. (2009). Development of seaweed cultivation in Tanzania: the role of the University of Dar es Salaam and other institutions. Sustainable Aquaculture Research Networks in sub-Saharan Africa (SARNISSA), EC FP7 Project, University of Stirling, UK <http://aquaculturecompendium.wiki.zoho.com/Case-Studies.html>

<sup>68</sup> Conklin, E.J. and Smith, J.E.(2005). Abundance and spread of the invasive red algae, *Kappaphycus* spp., in Kane’ohe Bay,Hawai’i and an experimental assessment of management options. *Biol. Inv.* 7: 1029–1039.

<sup>69</sup> Obura, D., Mishal Gudka, Fouad Abdou Rabi, Suraj Bacha Gian, Jude Bijoux,Sarah Freed, Jean Maharavo, Jervas Mwaura, Sean Porter, Erwan Sola, Julien Wickel, Saleh Yahya and Said Ahamada (2017) Coral reef status report for the Western Indian Ocean.Global Coral Reef Monitoring Network (GCRMN)/International Coral Reef Initiative (ICRI). pp 144.

<sup>70</sup> Regional State of the Coast Report: Western Indian Ocean (2015). UNEP.

<sup>71</sup> Available at: <https://manwinwin.com/en/seychelles-based-canned-tuna-manufacturer-latest-manwinwin-deal-in-africa/>

Regional associations	<ul style="list-style-type: none"> <li>▪ African Women Fish Processors and Traders Network</li> </ul>
National associations	<ul style="list-style-type: none"> <li>▪ Tanzania Industrial Fishing and Processors Association</li> <li>▪ Kenya Fish Processors and Exporters Association</li> <li>▪ South African Association of Seafood Importers and Exporters</li> </ul>
Individual operators (large / medium)	<ul style="list-style-type: none"> <li>▪ Robberg Fine Foods</li> <li>▪ Premier Fishing</li> <li>▪ Indian Ocean Tuna</li> <li>▪ Pechexport S.A. Madagascar</li> </ul>
Community and small-scale fish processing and trade associations / networks	<ul style="list-style-type: none"> <li>▪ Tanzania Women Fish Workers Association</li> </ul>

### 4.1.3.3 Environmental Impact

The main environmental impacts related to the seafood processing and canning industries are the various forms of pollution including:

- Microbial contamination (which has human health implications);
- Suspended solids, which increase water turbidity;
- Organic material and nutrients which can result in eutrophication, hypoxic conditions and harmful algal blooms; and
- Litter, especially plastics from packaging material.

These impacts are exacerbated if the facility is located in a port, or on an estuary or small bay where water turnover is limited.

## 4.2 Marine and Coastal Tourism

### 4.2.1 Sector Overview

Tourism is an important part of the economies of almost all WIO states, both as a component of GDP and as a source of employment. It is estimated, for example, that tourism accounts for about a quarter of Seychelles' economy, and about two thirds of Mauritius' economy. Tourism is a highly diffuse industry that comprises interacting segments such as transportation (international and domestic), accommodation, intermediaries such as tour operators and travel agents, catering services, retail (such as souvenirs), and local attractions and activities.<sup>72</sup> These diffuse linkages result in significant indirect positive economic impacts of tourism, but equally make it difficult to assess the full scale of these impacts. The tourism

<sup>72</sup> Available at: <https://saiia.org.za/research/coastal-tourism-and-economic-inclusion-in-indian-ocean-rim-association-states/>

industry is also noteworthy for the opportunities that it can potentially create for small business across a range of services including accommodation, ecotourism, diving and recreational fishing, etc. It should be noted, however, that small tourism-related businesses continue to face a range of challenges and the industry is generally dominated by larger, well-resourced, often foreign-based companies. Ensuring inclusive economic opportunities related to tourism is therefore an important priority for states in the WIO region.<sup>73</sup>

The main tourism features of the WIO region include sandy beaches, clean water, abundant sunshine, mangrove forest, and lagoons and seas. The region has a high diversity of coral reefs with significant economic value, particularly for dive tourists. The economic benefits of dive tourism were estimated to be an additional US\$ 75 000 – 174 000 annually in Kenya. The tourism sector in Madagascar is still relatively undeveloped taking into account the size and unique biodiversity of the country. The clear turquoise water of the small islands of Nosy Be and Ifaty, with a 90km long coral reef and Ile Sainte Marie off the east coast are ideal for diving, snorkelling and fishing. In addition, the rich and distinctive feature of the cultures of the WIO countries also offers many potential opportunities for the development of the tourism sector in the region.

Key tourism statistics are provided in Table 7. It should be noted that countries generally do not capture statistics for coastal and marine tourism as a component of the general tourism sector in terms of arrivals or contribution to GDP. Estimates of coastal and marine tourism can therefore be made at only the most general level. For certain countries, particularly small island states such as Comoros, Seychelles and Mauritius, effectively all tourism can be categorised as coastal and marine. In Kenya, it has been estimated that 60% of tourists spend at least part of their visit at coastal destinations.

Country	Length of Coastline in km	International Tourism Arrivals 2018 (million)	International Tourism Receipts in US \$million	Travel & tourism industry % GDP
Comoros	340	0.03	40	10.1
Kenya	536	2.03	824	8.8
Madagascar	4 828	0.29	307	15.7
Mauritius	177	1.4	1 572	24.3
Mozambique	2 470	2.74	108	8.1
Seychelles	491	0.35	414	67.1
Somalia	3 025	No data	No data	No data
South Africa	2 881	16.44	7 910	3.0
Tanzania	1 424	1.49	2 135	17.5

<sup>73</sup> Available at: <https://saiia.org.za/research/coastal-tourism-and-economic-inclusion-in-indian-ocean-rim-association-states/>



Source: World Bank

## 4.2.2 Key Stakeholders

Table 8: Key Stakeholders – Coastal and Marine Tourism		
Main categories	Sub-categories	Illustrative Examples*
Regional associations		<ul style="list-style-type: none"> <li>▪ African Tourism Board</li> <li>▪ Regional Tourism Organisation of Southern Africa</li> <li>▪ East Africa Tourism Platform</li> </ul>
National tourism associations		<ul style="list-style-type: none"> <li>▪ Madagascar National Tourism Board (ONTM)</li> <li>▪ Seychelles Hospitality and Tourism Association</li> </ul>
Accommodation associations	Hospitality associations	<ul style="list-style-type: none"> <li>▪ Federated Hospitality Association of South Africa</li> </ul>
	Association of hoteliers	<ul style="list-style-type: none"> <li>▪ Kenya Association of Hotelkeepers and Caterers</li> </ul>
	Lodge owners' associations	<ul style="list-style-type: none"> <li>▪ Association des Hoteliers et Restaurateurs de l'île Maurice</li> <li>▪ Small and Medium Hotels Association of Mauritius</li> </ul>
Sustainable Tourism Initiatives		<ul style="list-style-type: none"> <li>▪ Global Sustainable Tourism Council</li> </ul>
Eco-tourism and recreation associations	General tour operator associations	<ul style="list-style-type: none"> <li>▪ Tanzania Association of Tour Operators</li> <li>▪ Association des Tours Opérateurs Professionnels de Madagascar</li> </ul>
	Marine megafauna tourism operators	<ul style="list-style-type: none"> <li>▪ South African Boat Based Whale Watching Association (SABWWA)</li> </ul>
	Sports fishing / recreational fishing associations; diver operators; yacht clubs and marinas; sailing and water-based board sports associations	<ul style="list-style-type: none"> <li>▪ Kenya Association of Sea Anglers</li> <li>▪ Mombasa Yacht Club</li> <li>▪ Scuba Divers Federation of Seychelles</li> <li>▪ IORA Sustainable Whale and Dolphin Watching Tourism Network</li> </ul>
	Location-specific associations	<ul style="list-style-type: none"> <li>▪ Sardine Run Professional Association (South Africa)</li> </ul>

### 4.2.3 Environmental Impact

Despite its economic importance to the WIO region, marine and coastal tourism can have negative environmental impacts, including:

- Coastal erosion as a consequence of increased use of sand, limestone etc as construction materials for the development of infrastructure and amenities;<sup>74</sup>
- Habitat fragmentation and a reduction in biodiversity, as a result of, for example, clearance of mangroves or other coastal habitats for infrastructure construction;<sup>75</sup>
- Inadequate waste disposal systems;
- Pollution from hotels: sewage, for example, can result in increased nutrient levels which promote algal growth thereby impacting on the health of coral reefs and other components of the ecosystem;<sup>76</sup>
- Habitat destruction due to recreational activities (e.g. trampling of coral reefs; or damage by SCUBA divers and snorkellers);
- Increased pressure on protected areas.<sup>77</sup> For example, tourism-related damage to the reef in Watamu Marine National Park (Kenya) - where tourism is encouraged as a means to fund conservation – was recorded during a study on the link between reef condition and visitor satisfaction;<sup>78</sup>
- Increased pressure on endangered species. For example, changes in the nursing behaviour of Indo-Pacific bottle-nosed dolphins in an area off of Zanzibar where “swimming with dolphins” is a tourist attraction were observed as far back as 2007.<sup>79</sup> This species has recently been assessed as Near Threatened on IUCN’s Redlist;<sup>80</sup>
- Increased use of local natural resources (e.g. Freshwater, fish and shellfish) to meet the needs of growing numbers of tourists; and
- International tourism in particular contributes to climate change.<sup>81</sup> This has already had an impact on the region through coral bleaching events, increased frequency of storm events and sea-level rise.

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<sup>74</sup> Phillips M.R. and Jones A.L. (2006). Erosion and tourism infrastructure in the coastal zone: Problems, consequences and management. *Tour. Manag.* 27(3), 517–524

<sup>75</sup> Davenport, J., Davenport, J.L., 2006. The impact of tourism and personal leisure transport on coastal environments: a review. *Estuar. Coast. Shelf Sci.* 67 (1–2), 280–292.

<sup>76</sup> Fabricius, K.E., 2005. Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis. *Mar. Pollut. Bull.* 50 (2), 125–146.

<sup>77</sup> Buckley, R.C. (2012). Sustainable tourism: Research and reality. *Ann. Tour. Res.* 39(2), 528-546

<sup>78</sup> Cowburn, B., Sluka, R., Smith, J., Mohamed, M.O.S., 2013. Tourism, reef health, and visitor enjoyment in watamu marine national park, Kenya. *West. Indian Ocean J. Mar. Sci.* 12 (1), 57–70.

<sup>79</sup> Stensland, E. and Berggren, P. (2007). Behavioural changes in female Indo-Pacific bottlenose dolphins in response to boat-based tourism. *Mar. Ecol. Prog. Ser.* 332, 225-234

<sup>80</sup> Braulik, G., Natoli, A., Kiszka, J., Parra, G., Plön, S. & Smith, B.D. 2019. *Tursiops aduncus*. The IUCN Red List of Threatened Species 2019: e.T41714A50381127. <http://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T41714A50381127.en>

<sup>81</sup> Gössling, S. (2006). Towards sustainable Tourism in the Western Indian Ocean. *Western Indian Ocean J. Mar. Sci.*

## 4.3 Maritime Trade (Shipping and Ports)

### 4.3.1 Sector Overview

Africa relies heavily on ships and ports to service its intercontinental trade. While it accounts for approximately 2.7% of global trade by value, the continent contributes higher shares to global seaborne trade - 7% and 5% of maritime exports and imports by volume, respectively. While one-third of African countries are landlocked, maritime transport remains the main gateway to the global marketplace.<sup>82</sup>

Maritime trade in Africa is shaped by the continent's trade concentration and limited diversification. Accordingly, 38% of goods exported by sea in 2018 comprised of crude oil, while over two-thirds of imports were accounted for by dry cargoes (dry bulks and containerized goods) and close to 20% of imports were made up of petroleum products and gas.

The European Union remains Africa's major trading partner although its share of trade has declined from about half in 1995 to one-third in 2017. In recent years, the share of trade with the United States of America has fallen while trade with China has increased: China, and Asia in general, have incrementally cut into the EU and US share of African trade.

Africa's ports account for 4% of global containerized trade volume, much of which comprises imports of manufactured goods. Africa's shipping and ports do not always match global trends and standards. No African ports were featured on the most recent list of Top 100 global container ports.

Country	Main Port(s)	TEU per country
Comoros	Moroni (7000 TEU/annum) and Mutsamudu	No data
Kenya	Mombasa, Malindi Under construction: Port Lamu	13,000,000
Madagascar	Toamasina, Diego Saurez, Majunga, Morondava	173,706
Mauritius	Port Louis	451,446
Mozambique	Container: Pemba (small pier or wharf) Nacala (small seaport) Quelimane (small pier or wharf) Beira Maputo (medium seaport) Sea ports: Inhambane Chinde Macuse Pebane Mozambique	454,300
Seychelles	Port Victoria	25,000
Somalia	Container: Berbera (medium seaport) Sea ports: Merca Dante Kismayu Under construction: Port Hobyo	

<sup>82</sup> <https://www.tralac.org/news/article/13541-maritime-trade-and-africa.html>

South Africa	Richards Bay, Durban, East London, Port Elizabeth, Port of Ngqura, Mossel Bay, Cape Town and Saldanha Bay	4,892,400
Tanzania	Container: Tanga (small seaport) Dar es Salaam (large seaport) Sea ports: Pangani Kilwa Masoko Lindi Mtwara Bagamoyo (to be built online SEZ)	1,190,000

Source: UNCTADStat

Table 10: Maritime Trade – Africa and World (2018)				
	World	Africa	Africa as % of World	% of total goods loaded/unloaded Africa
Crude oil loaded	1886.248	289.3345	15.3%	37.7%
Other tanker trade loaded	1308.086	73.78311	5.6%	9.6%
Dry cargo loaded	7810.656	404.0492	5.2%	52.7%
<b>Total goods loaded</b>	<b>11004.99</b>	<b>767.1668</b>	<b>7.0%</b>	<b>100.0%</b>
Crude oil unloaded	2048.452	42.466	2.1%	8.2%
Other tanker trade unloaded	1321.848	93.87336	7.1%	18.2%
Dry cargo unloaded	7631.868	380.005	5.0%	73.6%
<b>Total goods unloaded</b>	<b>11002.17</b>	<b>516.3444</b>	<b>4.7%</b>	<b>100.0%</b>

Source: UNCTADStat

### 4.3.2 Key Stakeholders

Table 11: Key Stakeholders – Maritime Trade	
Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ World Shipping Council</li> <li>▪ Women's International Shipping and Trading Association</li> <li>▪ International Chamber of Shipping</li> </ul>
Regional associations	<ul style="list-style-type: none"> <li>▪ Port Management Association of Eastern and Southern Africa</li> <li>▪ Women in Maritime Eastern and Southern Africa</li> <li>▪ Women in Maritime-Africa</li> </ul>
National associations	<ul style="list-style-type: none"> <li>▪ Kenya Ship Agents Association</li> <li>▪ South African Association of Ship Operators and Agents</li> <li>▪ Tanzania Shipping Agents Association</li> </ul>
Individual operators	<ul style="list-style-type: none"> <li>▪ Maersk</li> <li>▪ Seaforth Shipping</li> <li>▪ Mediterranean Shipping</li> <li>▪ Star Shipping</li> </ul>

### 4.3.3 Environmental Impacts

#### **Environmental impacts of shipping**

Vessels – from massive tankers and bulk carriers to private yachts and boats - have a variety of potential impacts on coastal and marine ecosystems. These impacts may be caused by pollution – either from the vessel's day-to-day operational activities or as a result of accidents – or through the introduction of invasive alien species primarily via ship's ballast water and hull-fouling.

#### Pollution

The most common pollutant associated with shipping accidents is oil – both fuel oil and oil carried as cargo. However, vessels also carry a wide range of cargoes – from hazardous chemicals to household items – which also pose significant risks in the event of accidents. Thus, although the number of major oil spills has declined in recent years, the growth in seaborne trade has increased the threat of accidents involving other pollutants. For example, the annual seaborne chemical trade has grown from 151 million tonnes in 2005<sup>83</sup> to 200 million tonnes in 2019.<sup>84</sup> Moreover, the growth of the world fleet has led to shipping lanes becoming more and more congested, thereby increasing the risks of accidents – particularly around ports. The risk of accidents is also likely to be further exacerbated by an increase in adverse weather conditions as a consequence of climate change.<sup>85</sup>

There have been relatively few shipping accidents in the WIO. The only major oil spill listed by the International Tanker Owners Pollution Federation (ITOPF) in the WIO region is the Katina P, a Greek tanker which spilled an estimated 13 000 tonnes of #6 heavy fuel oil in the Mozambique channel in 1992. The International Maritime Organisation (IMO) has a database of shipping casualties which lists a number of incidents in countries in the region. Of those in South Africa, the most serious was the Jolly Rubino (2002) which involved the loss of hazardous chemicals and oil in close proximity to the Lake St. Lucia Wetlands Park – a World Heritage site. The Kenyan National Oil Spill Response Contingency Plan (2007) made reference to around 30 spills in and near Port of Mombasa, while an unpublished report prepared for WIO-LaB noted a spill from a Single Buoy Mooring near Dar es Salaam.<sup>86</sup>

Pollutants from operational activities range from oil, to hazardous substances, to sewage, garbage and emissions of sulphur dioxide, nitrous oxides and CO<sub>2</sub>. Although all vessels are likely to generate some oil pollution from their engines, the relative proportion of other categories of pollutants depends on the type of ship. Cruise ships, for example, which may

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<sup>83</sup> Ocean Shipping Consultants (2006). *Chemical Carriers and Product Tankers: Demand, Supply and Profitability to 2015*. [www.OSClimited.com](http://www.OSClimited.com)

<sup>84</sup> UNCTAD (2019) *Review of Maritime Transport 2019*. UN Publication 2019.132pp.

<sup>85</sup> Wright, P. Impacts of climate change on ports and shipping. MCCIP Science Review 2013

<sup>86</sup> Mohammed, S.M., Machiwa, J., Njau, K.N. and Ram, R. (2008). Tanzania National Summary Report on Priority Land-based Activities, Sources of Pollution, and Pollutant Levels in Water and Sediment. Unpublished Report prepared for WIO-LaB

carry up to 5,000 people, generate far larger volumes of sewage and garbage than oil tankers or bulk carriers which have only a small crew on board. An indication of the type of pollution which can be expected from shipping in a particular region can therefore be obtained through an analysis of the shipping activity. Oil tanker traffic is common in the WIO region because it falls on the route between the oil-producing countries of the Middle East and their markets. Moreover, since 2006 there has been an increase in the exploitation and export of offshore oil reserves from the region itself.

Data on operational pollution from ships in the WIO region is to all intents and purposes non-existent. Moreover, once pollutants are in the environment they are difficult to separate in terms of sources and since some 80% of marine pollution globally emanates from land-based sources it can reasonably safely be assumed that – except in the case of some accidents – the impacts from shipping have been comparatively limited. In terms of damage from spills, a paper by Abuodha and Kairo (2001)<sup>87</sup> described damage caused to a mangrove forest in Mombasa initially as a result of a spill from a tanker in 1972, and subsequently from a number of other spills. However, the Transboundary Diagnostic Analysis (TDA) (2009) undertaken by WIOLaB noted that the key water quality issues for the region were microbial contamination and suspended solids, the main source of which is untreated or partially treated municipal wastewater. At the same time, a number of the pollution hotspots identified in the TDA were in the vicinity of ports.

Vessels emit significant quantities of atmospheric pollutants such as sulphur oxides, nitrogen oxides and particulates all of which impact both human and environmental health. They also generate greenhouse gases such as carbon dioxide. The global fleet is estimated to produce some three per cent of global carbon emissions thereby contributing to climate change.

An assessment of marine litter in the WIO Region also concluded that marine based sources of litter do not appear to be as significant as land based sources although loss of fishing gear and dumping of garbage from fishing boats is widespread.<sup>88</sup> This was re-affirmed in the TDA (2009). Regardless of source, recent simulations have suggested that floating plastic litter is likely to accumulate in several convergence zones, including the Indian Ocean gyre as shown in Fig. 2 below.

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<sup>87</sup> Abouda, P and Kairo, J.G. (2001) Human-induced stresses on mangrove swamps along the Kenyan Coast, Researchgate

<sup>88</sup> UNEP, Nairobi Convention Secretariat, WIOMSA (2008). *Marine Litter in the Eastern Africa Region: An Overview Assessment*. 66pp.

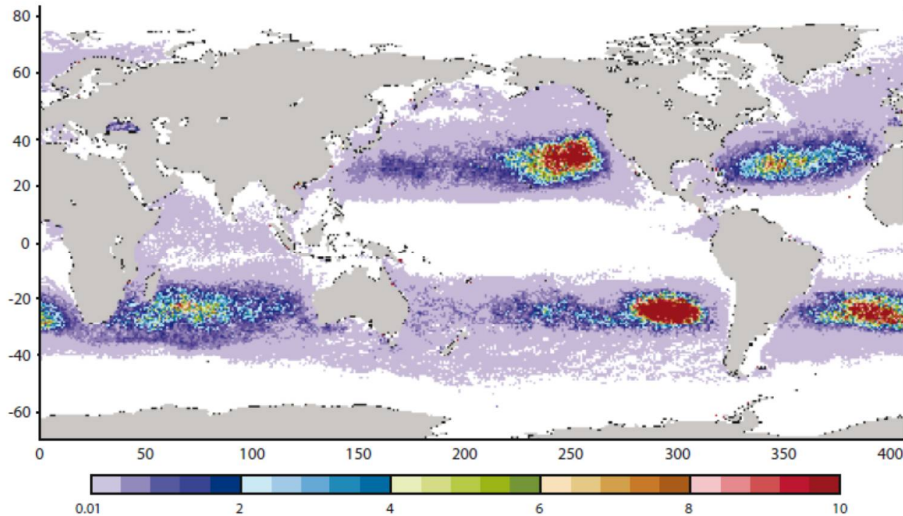


Fig. 2. A model simulation of the distribution of marine litter in the ocean after ten years shows plastic converging in the five gyres: the Indian Ocean gyre, the North and South Pacific gyres, and the North and South Atlantic gyres. The simulation, derived from a uniform initial distribution and based on real drifter movements, shows the influence of the five main gyres over time. Source: IPRC, 2008.

A number of other studies have investigated the accumulation of marine litter – particularly plastics - on the seafloor. One of these,<sup>89</sup> found that seabed litter is widespread, especially on submarine features such as seamounts. They also concluded that the litter at the sites they investigated in the Indian Ocean was predominantly fishing gear.

Apart from impacts on human health and tourism, marine litter affects biodiversity as a result of ingestion, entanglement (especially of turtles, seabirds and mammals) and smothering – for example, on coral reefs. Although few specific studies have been done – and those that have do not distinguish between sources of marine litter - Kenya’s Sea Turtle Strategy identified marine litter as a threat. Plastic litter has also been found in seabirds from the south western Indian Ocean.<sup>90</sup>

Marine debris is also a vector for the translocation of alien species across the oceans.

### Invasive alien species

Shipping is the most common pathway for the translocation of invasive alien species in the marine environment being responsible for some 69% of introductions.<sup>91</sup> Of the species introduced via shipping an estimated 39% were introduced by hull-fouling, 31% via ballast water, and the remainder by both.

<sup>89</sup> Woodall, L.C., Robinson, L.F., Rogers, A.D., Narayanaswamy, B.E. and Paterson, G.L.J., (2015). Deep-sea litter: a comparison of seamounts, banks and a ridge in the Atlantic and Indian Oceans reveals both environmental and anthropogenic factors impact accumulation and composition. *Frontiers in Marine Science*, 02 February 2015. doi: 10.3389/fmars.2015.00003.

<sup>90</sup> Ryan, P. G. (2008). Seabirds indicate changes in the composition of plastic litter in the Atlantic and south-western Indian Oceans. *Marine Pollution Bulletin*, 56(8), 1406-1409.

<sup>91</sup> Molnar, J.L., Gamboa, R.L., Revenga, C. and Spalding, M. (2008). Assessing the global threat of invasive species to marine biodiversity. *Front. Ecol. Environ.* 6(9), 485-492

Invasive marine species can have a variety of impacts including:

- Ecological impacts occur when the local biodiversity of the area and/or the ecological processes are altered by the invasive species;
- Economic impacts - including losses as a consequence of reduced productivity, and costs incurred for the prevention and management of invasive species; and
- Public health impacts: ballast water can transfer a range of species including bacteria, viruses and microalgae such as those that cause harmful algal blooms (HABS) with consequential health impacts.

A baseline report on marine invasive species in the WIO region was compiled for the ASCLME project in 2012.<sup>92</sup> This report recorded a total of 104 introduced or alien species and 45 cryptogenic species within the region, of which only six were considered to be invasive. These included the barnacle (*Balanus glandulus*), the Green crab (*Carcinus maenas*), three species of mussels (*Musculista senhousia*, *Mytilus galloprovincialis*, *Semimytilus algosus*), and an oyster (*Crassostrea gigas*). The 2012 report also referred to a number of Harmful Algal Bloom (HAB) events which had been reported in Kenya, Mauritius, Somalia, South Africa and Tanzania. However red tides and other HAB events occur throughout the region usually associated with the beginning of the North-east monsoon season in East Africa and do not necessarily involve alien species.<sup>93</sup>

The baseline list was updated in 2015 as part of the Indian Ocean Commission (IOC) European Union funded Biodiversity Project “Coastal, Marine and Island Specific Biodiversity Management in ESA-IO Coastal States”. This saw the addition of few species including the gastropod (*Drupella cornus*) and the mussel *Mytilopsis adamsi* as well as others whose identification was yet to be confirmed.<sup>94</sup>

The biggest impacts to date – apart from HAB events – have been as a result of outbreaks of the Crown-of-thorns Starfish (*Acanthaster planci*) which is considered to be cryptogenic. It has been reported by a number of countries in the region where it has caused extensive damage to coral reefs such that some countries have implemented control programmes.<sup>95</sup>

## Environmental impacts of port activities

The environmental impacts of activities in ports are a combination of those caused by shipping itself and those caused by land-based activities both in and adjacent to the ports.

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<sup>92</sup> (Awad, 2012)

<sup>93</sup> Awad, A. (2011). Report on the Invasive Species Component of the MEDA's, TDA and SAP for the ASCLME Project. Cape Town, South Africa

<sup>94</sup> Awad, A. & Jackson, L.F. (2015). Coastal, Marine and Island Specific Biodiversity Management in ESA-10 Coastal States: Baseline Report on Marine Invasive Species. Unpublished Report prepared for the Indian Ocean Commission. 78pp.

<sup>95</sup> Awad, A. & Jackson, L.F. (2015). Coastal, Marine and Island Specific Biodiversity Management in ESA-10 Coastal States: Baseline Report on Marine Invasive Species. Unpublished Report prepared for the Indian Ocean Commission. 78pp.



Activities within ports often include, for example, ship/boat building and maintenance, as well as fish-processing facilities. Since ports are frequently located in sheltered and sensitive environments such as bays and estuaries, these impacts can be quite severe – if somewhat localised. Impacts can include loss of water quality; loss of habitat e.g. mangroves; displacement of artisanal fishers; loss of archaeological and cultural resources.<sup>96</sup>

Both port construction and maintenance however, also involve dredging which can lead to the disposal of millions of tonnes of dredged material (sediments) – which can be highly contaminated - well beyond port limits.

Information on dredging activities in the region is limited. The WIO-LaB project did, however, generate some general information on dredging activities. For example:

- Munga et al (2006)<sup>97</sup> reported that the dredged material from the port and channels of Kilindini Harbour in Mombasa is disposed of in the adjacent deep waters beyond the reef. These sediments contain significant amounts of particulate material and associated chemicals such as nutrients, heavy metals, persistent organic contaminants;
- Dredging in Port Louis, is undertaken on an *ad hoc* basis in existing channels for maintenance purposes, as well as for strategic port development;<sup>98</sup>
- The four most important ports in Mozambique are Maputo, Matola, Beira and Nacala. Poor land-use practices result in high levels of sedimentation in coastal environments and, as a result, frequent dredging of these harbours and their entrance channels is needed. Surveys from 10 years ago showed that between 1.2 x 10<sup>6</sup> m<sup>3</sup> and 2.5 x 10<sup>6</sup> m<sup>3</sup> of sediments need to be dredged annually from the ports of Maputo and Beira respectively.<sup>99</sup>

It is also noted that the majority of the pollution hotspots identified during the WIO-LaB project were in or adjacent to ports. For example:

- The sediments in Dar es Salaam harbour were reported to contain high levels of heavy metal and organophosphates;<sup>100</sup>
- Port Victoria had high levels of metals, microbiological pollutants and nutrients.<sup>101</sup>

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<sup>96</sup> Ministry of Transport: Kenya (2013). ESIA Study Report for Construction of the First Three Berths of the Proposed Lamu Port and Associated Infrastructure. Final Report.

<sup>97</sup> Munga, D., Mwangi, S., Kamau, J., Nguli, M.M., Gwada, . PO., Daudi, L.N., Ong'Anda H., Mwanguni, S.M., Massa, H.S., Tole, M., Onyari, J.M., Makopa, J., Gachanja, A., Opello, G., Kheir, A. and Machua, S. (2006). Land-based activities, pollution sources and levels in water and sediment in the coastal and marine area of Kenya. Draft report submitted to WIO-LaB PMU. Nairobi, Kenya

<sup>98</sup> Anon (2009). National summary report on land-based activities, sources of pollution and pollutant levels in water and sediment: Mauritius. Unpublished Report submitted to UNEP/WIO-LaB Project/Nairobi Convention Secretariat, Nairobi, Kenya.

<sup>99</sup> FAO (1999). Land-based sources and activities affecting the marine, coastal and associated freshwater environment in Comores, Kenya, Mozambique, Seychelles and United Republic of Tanzania. EAF/5. Waruinge D. and Ouya D. (eds). Nairobi, Kenya, 42 pp.

<sup>100</sup> Mohammed, SM, Machiwa, J, Njau, KN and Ram, R. (2008) Tanzania National Summary Report on Priority Land-based Activities, Sources of Pollution, and Pollutant Levels in Water and Sediment. Unpublished Report prepared for WIOLaB. 121pp.

<sup>101</sup> Antoine, H., Carolus, I., Naya, N., Radegonde, V. and Sabury, E. (2008). The status of coastal and marine pollution in Seychelles. Unpublished Report submitted to UNEP/WIO-LaB Project/Nairobi Convention Secretariat. Nairobi, Kenya

- Heavy metals, particularly lead (Pb), were found in the Port of Maputo from discharges of the Matola and Maputo Rivers, as well as in Nacala Bay;<sup>102</sup> and
- The majority of oil spills reported in Kenya have been in and around the port of Mombasa.

## 4.4 Shipbuilding and Ship Repair

### 4.4.1 Sector Overview

China, Japan and Korea account for 90% of shipbuilding activity globally.<sup>103</sup> There are however, a small number of ship and boatbuilding yards in the WIO, including in Kenya, Mozambique, Seychelles, South Africa and Tanzania.<sup>104</sup> These mainly construct small to medium-sized vessels such as barges, fishing boats, tugs, speedboats, dredgers, freighters, ocean survey and research vessels, ferries, yachts and others. In addition, most of the larger ports have ship repair/maintenance facilities.

### 4.4.2 Key Stakeholders

Table 12: Key Stakeholders – Shipbuilding and Ship Repair	
Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ The International Council of Marine Industry Associations</li> </ul>
National associations	<ul style="list-style-type: none"> <li>▪ The South African Association of Ship Builders and Repairers</li> <li>▪ South African Boat Builders Export Council</li> </ul>
Individual operators	<ul style="list-style-type: none"> <li>▪ Southern African Shipyards</li> <li>▪ African Marine and General Engineering, Kenya Shipyards</li> <li>▪ Taylor Smith Group (Mauritius and Seychelles)</li> <li>▪ Dormac - Durban</li> </ul>

### 4.4.3 Environmental Impact

The environmental impacts of shipbuilding and repair potentially include various forms of pollution:

- Contaminated water produced during the cleaning of the vessel prior to repair;

<sup>102</sup> Fernandes, A. (1996). Pollution in Maputo Bay: Contamination levels from 1968 to 1996. *Revista Médica de Mozambique* 6(34). Instituto Nacional de Saúde, Anon Mozambique (2007). Mozambique national summary report on land-based activities, sources of pollution and pollutant levels in water and sediment. Draft report submitted to WIO-LaB PMU. Nairobi, Kenya

<sup>103</sup> UNCTAD (2019) *Review of Maritime Transport 2019*. UN Publication 2019. 132pp.

<sup>104</sup> Shipbuilding by country in which built: <http://stats.unctad.org/shipbuilding>

- Materials generated during welding and blasting activities (these can include heavy metals which tend to accumulate in sediments in and around drydock facilities);
- Gas and dust waste from sand blasting activities;
- Oil and lubricants emanating from engines and equipment on board;
- Paint, vapours and packaging produced during the cleaning and painting process.

In addition, the discharge of residual ballast water and biomass from hull cleaning can result in the introduction of alien species.<sup>105</sup> Although there can be quite high concentrations of pollutants in ports, these are generally fairly localised. They may, however, be spread further afield through the dredging and disposal of contaminated sediments from the port into coastal waters.

Traditional fishing vessels used by artisanal fishers - including small boats, dhows, canoes, outrigger canoes and dinghies – are generally made and repaired by artisans.<sup>106</sup> These activities may generate some pollution similar to those described above, but a more important impact, perhaps is the utilisation of, for example, mangroves used as a source of boatbuilding material.

## 4.5 Oil and Gas

### 4.5.1 Sector Overview

Total's announcement in February 2019 of a major offshore gas find in South Africa's Outeniqua Basin has again underscored the significant potential offshore energy reserves of the Western Indian Ocean region. Estimates of the size of these reserves are still uncertain, with estimates ranging from 200 million barrels of oil equivalent (BOE) to as high as a billion BOE. It is now several years after the major offshore gas discoveries made between 2010 and 2014 off the southern coast of Tanzania and the northern coast of Mozambique, with a combined estimated reserve of 150 trillion cubic feet.

Significant offshore oil and gas operations in the region include:<sup>107</sup>

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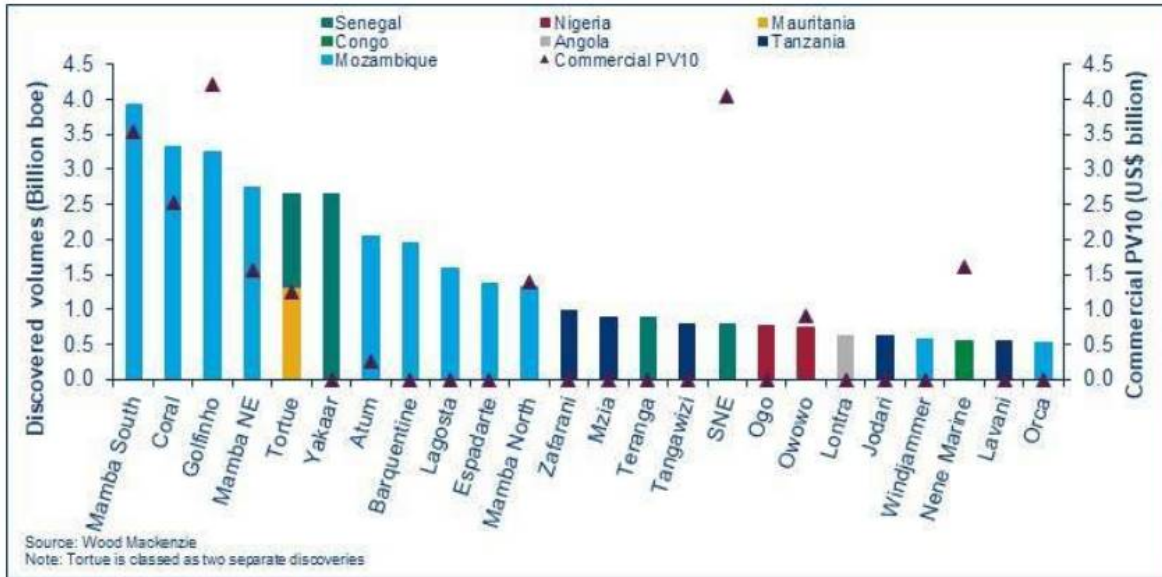
<sup>105</sup> Ashari, R. Budianto, E. and Herdiansyah, H. (2019). Environmental risk assessment on ship repair work at cilegon national shipyard company. *J. Phys.: Conf. Ser.* **1363** 012003

<sup>106</sup> Jiddawi, N.S. and Öhman, M.C. (2002) Marine fisheries in Tanzania. *Ambio* 31

<sup>107</sup> Available at: <https://www.airswift.com/blog/the-5-major-energy-projects-that-are-set-to-change-africa>; <https://www.africa-oilweek.com/Articles/africa-oil-gas-project-watch-east-africa>

- Mozambique: Mozambique LNG is under construction in the Afungi peninsula in Cabo Delgado province to tap into the approximately 75 trillion cubic feet of recoverable natural gas said to lie in Offshore Area 1. The project aims to deliver those natural, sustainable and cleaner gases to various markets.
- Mozambique: Area 4 contains approximately 85 trillion cubic feet of natural gas. Coral FLNG, operated by Mozambique Rovuma Ventures & lead by Eni, is well underway having passed FID back in 2017. The Reef Consortium (Technip, JGC, SHI) are constructing the vessel in South Korea, and when ready it will travel down to Mozambique and start production from the 5Tcf gas field at Coral South.
- Tanzania: LNG Liquefaction Plant. The \$30bn project, led by Shell, has been held up for years due to regularity delays, finalizing issues relating to the acquisition of land at the site and establishing a legal framework for the nascent hydrocarbon industry. However, although negotiations are still on-going, the government recently announced that construction will commence in 2022, with expected completion in 2028. The LNG export terminal will be built at Lindi in the south of Tanzania, near the offshore natural gas discoveries in deep water. The project will have capacity to produce 10 million tonnes per annum (MTPA) of liquefied natural gas.
- Tanzania/Uganda: EACOP/Tilenga. The East African Crude Oil Pipeline (EACOP) is an oil export project designed to transport crude Oil from Kabaale-Hoima near Lake Albert in Uganda to the Chongoleani peninsula, close to Tanga port in Tanzania. The heated pipeline (due to Ugandan crude's waxy nature) will be 1,443km in length with 216Kbd the expected flow rate per day.
- Kenya: The LAPSSSET Corridor Programme is a regional flagship project intended to provide transport and logistics infrastructure aimed at creating seamless connectivity between the Eastern African Countries of Kenya, Ethiopia and South Sudan. The LAPSSSET programme consists of several subsidiary projects, including the development of Lamu Port consisting of 32 deep sea berths; interregional standard gauge railway lines from Lamu to Isiolo, Isiolo to Nakodok (Kenya/South Sudan border) and Juba(South Sudan), Isiolo to Moyale (Kenya/Ethiopia border) and Addis Ababa (Ethiopia), and Nairobi to Isiolo; interregional highways from Lamu to Isiolo, Isiolo to Nakodok and Juba (South Sudan), Isiolo to Moyale and to Addis Ababa (Ethiopia), and Lamu to Garsen (Kenya); a crude oil pipeline from Lamu to Isiolo, Isiolo to Nakodok and Nakodok to Juba (South Sudan); a product oil pipeline from Lamu to Isiolo, Isiolo to Moyale (Kenya) and Moyale to Addis Ababa (Ethiopia); international airports at Lamu, Isiolo, and Lake Turkana; resort cities at Lamu, Isiolo and Lake Turkana; a merchant oil refinery at Lamu; the High Grand Falls Multipurpose Dam; and fibre optic cables and communication systems.

Figure 3: Major Recent Oil and Gas Finds in Africa



Source: <https://www.nsenenergybusiness.com/news/gas-in-mozambique-and-tanzania/>

#### 4.5.2 Key Stakeholders

Table 13: Key Stakeholders – Oil and Gas	
Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ International Association of Oil and Gas Producers</li> <li>▪ World Petroleum Council</li> <li>▪ IPIECA</li> </ul>
Regional associations	<ul style="list-style-type: none"> <li>▪ African Petroleum Producers' Organisation</li> <li>▪ Petroleum Institute of East Africa</li> <li>▪ African Refiners Association</li> </ul>
National associations	<ul style="list-style-type: none"> <li>▪ Offshore Petroleum Association of South Africa</li> <li>▪ Association of Tanzania Oil and Gas Service Providers</li> <li>▪ Kenya Oil &amp; Gas Association</li> </ul>
Individual operators	<ul style="list-style-type: none"> <li>▪ Occidental Petroleum / Anadarko</li> <li>▪ ExxonMobil</li> <li>▪ ENI</li> <li>▪ Equinor</li> <li>▪ Total</li> </ul>

#### 4.5.3 Environmental Impact

Oil and gas exploration and production involve a number of activities which may have negative environmental impacts. These include:

#### Exploration phase:

- seismological surveys (surveys of the seabed and its subsoil, including sample taking)
- exploration drilling.

#### Production phase:

- establishment and operation of drilling platforms which include
- accommodations for the personnel
- development drilling
- recovery, treatment and storage of the resource
- transportation to shore by pipeline and/or ships
- maintenance, repair and ancillary operations.

Offshore platforms also serve as potential pathways for the introduction of alien species.

The environmental impacts of these activities include:

- Physical obstruction of other activities and processes (navigation, fishing, migrations/ movement of marine species, sediment transport);
- Seismic surveys affect marine mammals;
- Pollution from drilling muds and cuttings, produced water and oil spills caused by blow-outs from wells and during transportation (by vessels or pipelines);
- Discarded sediments – turbidity and smothering;
- Degradation especially of sensitive ecosystems such as mangroves, seagrass beds and coral reefs.

Despite the expansion of offshore oil and gas activities in the region in recent years, there do not appear to have been any major pollution incidents to date. However, the growing number of platforms and associated in the area increases the potential for accidents as well as conflicts with fisheries interests due to physical exclusion from drilling areas.

## **4.6 Coastal and Offshore Renewable Energy**

### **4.6.1 Sector Overview**

Offshore renewable energy (primarily offshore wind, but also including tidal, wave, floating solar and other technologies) is a small but rapidly developing component of energy generating technologies. Several states in the region have conducted feasibility studies for

offshore energy technologies and included them in national energy plans. Mauritius, for example, has initiated a process to develop offshore wind farms and tidal energy. The Government of Seychelles has recently partnered with French developer Qair for the development of a 5 megawatt (MW) floating solar plant. In South Africa a joint venture has been formed by European renewable energy firm Hexicon AB and the South African Genesis Eco-Energy Developments to explore the development of large-scale floating wind farms offshore South Africa. Offshore wind projects have also been proposed for Kenya and Tanzania, though their status is unclear. Several operational wind energy operations are land-based but situated in the coastal area (e.g. South African wind farms in Darling, Port Elizabeth, Jeffrey's Bay and other locations, Seychelles' Port Victoria Wind Power Project).

#### 4.6.2 Key Stakeholders

Table 14: Key Stakeholders – Desalination	
Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ Global Wind Energy Council</li> <li>▪ Ocean Renewable Energy Action Coalition</li> <li>▪ International Renewable Energy Agency</li> </ul>
Regional Associations	<ul style="list-style-type: none"> <li>▪ African Sustainable Energy Association</li> <li>▪ African Renewable Energy Alliance</li> <li>▪ Sustainable Energy Society of Southern Africa</li> </ul>
National Associations	<ul style="list-style-type: none"> <li>▪ Tanzania Renewable Energy Association</li> <li>▪ Kenya Renewable Energy Association</li> <li>▪ South African Renewable Energy Council</li> <li>▪ South African Wind Energy Association</li> </ul>

#### 4.6.3 Environmental Impact

The environmental impacts of offshore energy technologies are generally not well understood, given that many of these technologies are very new. Offshore wind energy is more established than tidal, wave, floating solar and other offshore renewable energy technologies. Studies have highlighted the following potential environmental impacts:

- Impacts on birds through:
  - risk of collision,
  - short-term habitat loss during construction,
  - long-term habitat loss due to disturbance by turbines including disturbances from boating activities in connection with maintenance,
  - formation of barriers on migration routes, and
  - disconnection of ecological units, such as roosting and feeding sites.
- Impacts on marine mammals and other marine life through noise pollution, particularly during the construction phase
- Impacts on marine mammals and other marine life through electromagnetic fields

Scientists have also highlighted positive environmental effects of offshore wind installations, for example through creating de facto sanctuaries due to fishing restrictions around wind farms and wind farm foundations serving as artificial reefs.<sup>108</sup> A study of impacts of European offshore wind projects on bird populations noted that careful siting can avoid many potential conflicts with avian populations and noted that collision rates were low. They do note, however, that further research and detailed monitoring is required to fully understand the environmental impact of offshore wind on bird populations.<sup>109</sup>

## 4.7 Coastal and Seabed Mining

### 4.7.1 Sector Overview

Coastal mining of heavy mineral sands is an established industry with significant operations within the WIO region. Examples include Richards Bay Minerals (Rio Tinto) in South Africa's KwaZulu-Natal province and Base Toliara (Base Resources) in Madagascar.<sup>110</sup> Several countries in the region possess significant mineral sands deposits, with several projects under development and ongoing exploration activities. The economic potential of mineral sand mining in coastal zones has sparked the interest of governments in the region, but these projects remain controversial due to potential impacts on the environment and communities. In certain cases, existing or proposed mineral sands operations have sparked fierce community opposition. In 2018, an investigation by Amnesty International argued that sand mining activities in Mozambique had contributed to environmental degradation that undermined community livelihoods and significantly exacerbated flood damage.

In addition to heavy mineral sands, sand and other aggregates are mined in many coastal regions within the WIO, primarily as an input to the construction industry. Here, too, there are significant concerns around governance and environmental impacts. Sand mining in the region is poorly regulated. Mining of sand and other aggregates often take place in riverbeds and estuaries, which play a critical role in the lifecycle of many marine species critical to local livelihoods and food security, as well as flood regulation and other ecosystem services.<sup>111</sup>

There has been growing interest in seabed mining as the International Seabed Authority (ISA) moves towards developing regulations for the licensing of mining within the Area. Within the Africa region, more than half of Namibia's diamond production is currently accounted for by seabed mining, while South Africa has licenced exploration blocks for seabed mining within its EEZ. To date, however, there has been no mining of deep-sea minerals within the EEZs of

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<sup>108</sup> Available at: <https://www.dw.com/en/how-do-offshore-wind-farms-affect-ocean-ecosystems/a-40969339>

<sup>109</sup> Available at: [https://www.offshorewindenergy.org/COD/reports/report-files/report\\_009.pdf](https://www.offshorewindenergy.org/COD/reports/report-files/report_009.pdf)

<sup>110</sup> Available at: [https://www.zircon-association.org/assets/files/KnowledgeBank/the-mineral-sands-industry-factbook-\(feb-2014\).pdf](https://www.zircon-association.org/assets/files/KnowledgeBank/the-mineral-sands-industry-factbook-(feb-2014).pdf)

<sup>111</sup> Available at: <https://saiia.org.za/research/illegal-sand-mining-in-south-africa/>



WIO states. The ISA has approved exploration licenses in the Indian Ocean, including for China Ocean Mineral Resources Research and Development Association (COMRA) which is a Chinese state agency and the governments of India and South Korea have secured Indian Ocean deep sea exploration rights. COMRA's block is in the south western Indian Ocean ridge in the Madagascar Plateau and South Korea's block is in the mid Indian ridge between the Mascarene plateau and the contentious Chagos plateau. India has been granted a polymetallic nodule exploration licence near Chagos. In the last five years China, South Korea and India have conducted intensive deep-sea studies and invested heavily in anticipation of exploiting the seabed.

#### 4.7.2 Key Stakeholders

Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ Titanium Dioxide Manufacturers Association</li> <li>▪ Zircon Industry Association</li> </ul>
Regional Associations	<ul style="list-style-type: none"> <li>▪ Mining Industry Association of Southern Africa</li> <li>▪ The Association of Chambers of Mines and other Mining Associations (Africa)</li> <li>▪ Eastern African Chamber of Mines and Extractive Industries</li> </ul>
National Chambers of Mines	<ul style="list-style-type: none"> <li>▪ Chamber of Mines of Mozambique</li> <li>▪ Minerals Council South Africa</li> <li>▪ Madagascar Chamber of Mines</li> </ul>
Individual operators / projects	<ul style="list-style-type: none"> <li>▪ Richards Bay Minerals (Rio Tinto)</li> <li>▪ Base Toliara (Base Resources)</li> <li>▪ Kwale Mineral Sands (Base Resources)</li> <li>▪ Dingsheng Minerals (Anhui Foreign Economic Construction Group)<sup>112</sup></li> <li>▪ Kenmare Resources</li> <li>▪ Savannah Resources</li> </ul>

#### 4.7.3 Environmental Impact

The removal of large quantities of sand and other materials alters the natural patterns of sediment transport along the coastline, often leading to coastal erosion. Low-lying coastlines comprising erodible materials are particularly vulnerable.<sup>113</sup> Coastal erosion together with the destruction of coral reefs during mining of live corals undermines the ability of coral reefs,

<sup>112</sup> Available at: <https://www.clbrief.com/boom-time-for-mozambiques-heavy-sands/>

<sup>113</sup> Theron, A.K. and Barwell, L.B. (2012). Responding to Climate Change in Mozambique: Theme 2: Coastal Planning and Adaptation to Mitigate Climate Change Impacts. Report prepared for National Institute for Disaster Management (INGC) by CSIR. Stellenbosch, South Africa

beaches and dunes to provide protection to the coast, coastal habitats – such as turtle nesting sites - and coastal property and infrastructure from sea surges during storms.

The mining of live coral also changes the surface topography of reefs leading to a reduction in microhabitats and therefore a decrease in biodiversity.<sup>114</sup> On Mafia Island, Tanzania, for example, degradation of the reefs due to mining saw a 42% decline in fish abundance and a 24% reduction in overall biodiversity of the reef.<sup>115</sup>

## 4.8 Desalination

### 4.8.1 Sector Overview

As Africa’s water resources come under increasing pressure due to growing populations, expanding cities and the impacts of climate change, interest in the potential of desalination is increasing. About 80% of Africa’s installed desalination capacity is accounted for by the North African region, with Algeria having the largest installed capacity on the continent. Sub-Saharan Africa accounts for only about 1.9% of global installed desalination capacity, with very limited activity in the WIO region. Desalination remains an expensive technology. Within the WIO region projects have tended to be small. There is also growing interest in solar power-based desalination technology that can be used to support communities directly. South Africa recently expanded its desalination capacity in its Western Cape province as part of its response to a debilitating drought.

	Million cubic meters per day	Percentage of global total
Middle East and North Africa	45.32	47.5%
East Asia and Pacific	17.52	18.4%
North America	11.34	11.9%
Western Europe	8.75	9.2%
Latin America and Caribbean	5.46	5.7%
South Asia	2.94	3.1%
Eastern Europe and Central Asia	2.26	2.4%

<sup>114</sup> DHI and Samaki (2014). Coastal Profile for Mainland Tanzania 2014 Thematic Volume – Draft 0. Investment Prioritization for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania DHI and Samaki Consultants

<sup>115</sup> Dulvy NK, Stanwell-Smith D, Darwall WRT, Horrill CJ. (1995). Coral mining at Mafia Island, Tanzania: a management dilemma. *Ambio* 24 No. 6, 258-365.

Sub-Saharan Africa	1.78	1.9%
<b>Total</b>	<b>95.37</b>	

Source: Statista, <https://www.statista.com/statistics/960259/capacity-operational-desalination-plants-by-region/>

## 4.8.2 Key Stakeholders

Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ International Desalination Association</li> </ul>
Regional Associations	<ul style="list-style-type: none"> <li>▪ African Water Association</li> </ul>
Individual operators / projects	<ul style="list-style-type: none"> <li>▪ Aqua Science and Technology Ltd</li> <li>▪ Veolia Water Solutions &amp; Technologies</li> <li>▪ Elemental Water Makers</li> <li>▪ Fluence</li> <li>▪ Afridev Mati Mozambique</li> <li>▪ Vergnet Hydro and Mascara Renewable Water</li> </ul>
Donors / NGOs supporting small scale, community focused desalination	<ul style="list-style-type: none"> <li>▪ Elemental Water Foundation</li> <li>▪ GivePower</li> </ul>

## 4.8.3 Environmental Impact

The growing number of people in coastal areas is putting increasing pressure on limited freshwater resources which in turn has led to significant growth in the desalination of seawater to meet this demand. Desalination, however, can have a number of negative environmental impacts. These include potential physical impacts on the coastline itself as well as the production of an effluent which is not only very briny – with concentrations of salt which can be double those of seawater – but which may be contaminated with a range of other pollutants such as metals, hydrocarbons and toxic anti-fouling compounds. The effluents also tend to be of a higher temperature than the water bodies into which they are discharged.<sup>116</sup>

The high concentrations of salt in the discharges means that they tend to form dense plumes which spread across the seabed. Such plumes have the potential to have lethal or chronic impacts on benthic communities which may result in alterations to community structure.

<sup>116</sup> Lamont, T., Roberts, M.J., Barlow, R.G., Morris, T. and van den Berg, M.A. (2010). Circulation patterns in the Delagoa Bight, Mozambique, and the influence of deep ocean eddies. *Afr. J. Marine Sci.*

These impacts are greatest in areas where there is limited potential for dilution of the effluent and can therefore be mitigated by appropriate siting of the discharge point.<sup>117</sup>

## 4.9 Undersea Cabling and Repair

### 4.9.1 Sector Overview

The past few years has seen a proliferation of submarine telecommunications cables servicing the region from the original SAT 3 which was laid in 2001 but which only connected to Mtunzini on the South African coast, Réunion and Mauritius. Since then the following have been deployed:

- **SEACOM** is a submarine cable operator with a network of submarine and terrestrial high speed fibre-optic cable that services the East and West coasts of Africa. It is privately funded and has been in service since July 2009.
- **TEAMS (The East African Marine System)** was initiated by the government of Kenya in partnership with the Emirates Telecommunication Establishment (Etisalat) in part due to frustrations in delays in the establishment of EASSy. It is a 4,500km cable linking Mombasa to Fujairah in the United Arab Emirates.
- **LION** is a 1,000 km long submarine communications cable system connecting Madagascar, Réunion, and Mauritius. The project was financed by a consortium made up of Orange Madagascar, Mauritius Telecom and France Telecom S.A.
- **LION2 is a 2,700 km extension of the LION cable** to Kenya via Mayotte. It has been in service since April 2012.<sup>118</sup>
- **EASSy** is a 10,000km submarine fibre-optic cable system deployed along the east and south coast of Africa with connections to multiple international submarine cable networks. It links South Africa with Sudan via landing points in Mozambique, Madagascar, the Comoros, Tanzania, Kenya, Somalia and Djibouti. It was initially partially funded by the World Bank, but is now owned and operated by a group of 16 African (92%) and international (8%) telecommunications operators and service providers.<sup>119</sup>The cable entered service in July 2010.
- **SEAS** connects the Seychelles to Dar es Salaam – and from there to EASSy – and was funded by the EU and the government of Seychelles.<sup>120</sup>

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<sup>117</sup> Lamont, T., Roberts, M.J., Barlow, R.G., Morris, T. and van den Berg, M.A. (2010). Circulation patterns in the Delagoa Bight, Mozambique, and the influence of deep ocean eddies. *Afr. J. Marine Sci.*

<sup>118</sup> Available at: [www.lion-submarinesystem.com](http://www.lion-submarinesystem.com)

<sup>119</sup> Also see: [www.eassy.org](http://www.eassy.org)

<sup>120</sup> Available at: <http://eu-africa-infrastructure-tf.net>

## 4.9.2 Key Stakeholders

Table 18: Key Stakeholders – Undersea Cabling and Repair	
Main categories	Illustrative Examples*
Global associations	<ul style="list-style-type: none"> <li>▪ International Cable Protection Committee</li> </ul>
Regional Associations	<ul style="list-style-type: none"> <li>▪ Southern Africa Telecommunications Association</li> </ul>
Individual operators / projects	<ul style="list-style-type: none"> <li>▪ Telkom/Vodacom</li> <li>▪ SEACOM</li> <li>▪ Orange</li> </ul>

## 4.9.3 Environmental Impact

Submarine cables have both onshore and offshore components. On the shore side, cables traversing the intertidal zone are generally buried and connect to onshore telecommunications networks via a manhole constructed on the beach. Of greater concern are activities during the laying and repair of submarine cables, as well as the ongoing presence thereof. These include:

- Potential damage to coral reefs and associated organisms as a consequence of the movement of inadequately secured cables both during construction and subsequently. This movement may occur as a result of currents and storms, or when cables are snagged by fishing gear or anchors;
- Sedimentation and turbidity during cable-laying operations;
- Their impacts on resource use as a result of i) the imposition of exclusion zones to protect the integrity of the cables which may be damaged as a result of, for example, trawling activities; and ii) the dissection of, for example, trawling grounds, into sections which are too small to be viably trawled; and
- Impacts on other activities and infrastructure in the vicinity of the cable route including mariculture activities, fish aggregating devices, archaeological resources, anchorage facilities and recreational activities.<sup>121</sup>

To a large extent, these impacts can be mitigated by investigating alternatives during the Environmental Impact Assessment process and selecting those which are optimal. For example:

- In the case of the EASSy cable, a route was selected in consultation with the prawn fishers which had limited impact on the trawling ground;
- In the case of the SEAS cable between Seychelles and Tanzania, the cable was buried in the shallow water section (0 – 1000m) to limit impacts to the

<sup>121</sup> CSIR. Environmental Impact Assessment of the Installation of a Fibre Optic Cable in Reunion: Main Report. CSIR Report ENV-S-C 2000-095

construction period (and prevent snagging of the line) (African Development Bank, 2010).

## **5. Interventions and Initiatives on Conservation and Protection of the Coastal and Marine Environment in the Western Indian Ocean**

There are a number of different tools, mechanisms or approaches which can be used by private companies to mitigate their impacts on marine and coastal ecosystems. In some cases these are sector-specific, while others may be common to a number of sectors. They include:

- The ecosystem approach to fisheries management
- Cleaner technologies
  - Seafood processing facilities
  - Pollution control on ships
  - Control of ships as vectors for the introduction of alien species via hull-fouling and ballast water management
- Contingency planning for incidents such as spillage of oil or hazardous chemicals

This section outlines some of the existing initiatives whose objective is to promote mainstreaming of these tools, mechanisms or approaches into the operations of the private sector – both global (but which are applicable in the WIO region), as well as some in the region. The initiatives covered include the establishment of alliances and partnerships as well as research on or installation of tools and mechanisms.

### **5.1 Global and Regional Alliances and Partnerships**

#### **The World Ocean Council**

The World Ocean Council (WOC)<sup>122</sup> is an alliance of the leadership of ocean industries which promotes “Corporate Ocean Responsibility” by fostering sustainable development, science and stewardship of the seas. Its membership comprises representatives from the shipping, oil and gas, fisheries, aquaculture, tourism, renewable energy (wind, wave, tidal), ports, dredging, and cabling sectors, as well as from the maritime legal, financial and insurance communities and research, academic and scientific Institutions.

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<sup>122</sup> Available at: <https://www.oceancouncil.org/>

The WOC has established a number of platforms and programmes. Platforms include Regional Ocean Councils, an Ocean Investment Platform, as well as platform on SDG 14, Young Ocean Professionals and Sustainable Ocean Summits. They have programmes on Ocean Policy and Governance, Marine Spatial Planning, Operational Environmental Issues and Smart Ocean – Smart Industries.

In terms of Operational Environmental Issues, WOC Members collaborate to identify, develop and implement best practices to addressing these issues. Operational issues currently seen as priorities include marine sound, port reception facilities, and biofouling and marine invasive species. The Smart Ocean –Smart Industry program is intended to promote collaboration between the business and scientific communities by facilitating the use of ships of opportunity for the deployment of scientific equipment for the collection and reporting of standardized ocean and atmospheric data. Such data would assist in monitoring /managing ocean ecosystems, understanding the ocean, weather and climate conditions and trends, improving ocean health and management, and improving the safety and sustainability of commercial activities at sea.

Some WOC members have a presence in the WIO region. Moreover, WOC engaged with regional stakeholders around the ASCLME project, and an aide memoire for cooperation and collaboration between the ASCLME project and the the WOC was signed in 2012.

### **Northern Mozambique Channel Initiative**

The Northern Mozambique Channel initiative<sup>123</sup> is a partnership of countries, civil society and the private sector, whose goal is to deliver a sustainable blue economy that preserves and builds its wealth across the natural, social, and economic capitals, within the central vision that by 2050, the people, countries and economies of the Northern Mozambique Channel prosper in a sustainable future founded on the natural and cultural assets and diversity of the region. It is led by CORDIO and WWF, with partners including the UNEP/Nairobi Convention Secretariat, WIO-Consortium, WCS, FFI, CI, IUCN, Blue Ventures, TNC, Rare, Birdlife International, Wetlands International, and WIOMSA. The promotion of integrated ocean governance (through the use of Marine Spatial Planning-MSP) and sustainable principles and standards for key economic sectors (in particular oil and gas extraction) are the two main focus areas for the initiative. It is envisioned that, through the Initiative, each country in the Northern Mozambique Channel area will be supported to build multi-actor and multi-sector collaborations and partnerships, allowing for an effective integrated approach to marine and coastal resources and coordinated use of marine space. While the project envisions

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<sup>123</sup> Available at: [https://wwf.panda.org/our\\_work/oceans/solutions/northern\\_mozambique\\_channel\\_initiative.cfm](https://wwf.panda.org/our_work/oceans/solutions/northern_mozambique_channel_initiative.cfm)

partnership with the private sector in MSP and broader maritime governance activities, private sector engagement has to date been limited.

## 5.2 Initiatives Related to the Ecosystem Approach to Fisheries Management

The FAO defines the ecosystem approach to fisheries (EAF) as follows: “An Ecosystem Approach to Fisheries strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries”.<sup>124</sup> One of the key objectives is the sustainable use of the *whole system* and not just targeted species.<sup>125</sup>

Some of the key principles addressed by EAF are as follows:

- fisheries should be managed to limit their impact on the ecosystem to an acceptable level;
- ecological relationships between species should be maintained;
- management measures should be compatible across the entire distribution of the resource.<sup>126</sup>

### Partnerships around EAF

The **Responsible Fisheries Alliance** (RFA) is a partnership between WWF-South Africa, Birdlife and four major fishing companies, namely, Irvin and Johnson (I&J), Oceana Group, Sea Harvest and Viking Fisheries, all of whom are members of SADSTIA.<sup>127</sup> It was formed in 2009 in a bid to enhance the implementation of an Ecosystems Approach to Fisheries management (EAF) in South Africa’s fisheries. The RFA also affords responsible fishing companies the opportunity to capitalise on the growing demand for sustainable products and enhance the credibility of the fishing industry. It is a forum that promotes self-governance through dialogue and capacity building initiatives as well as advocating for collaborative effort between government, industry and NGOs to address issues that undermine an EAF. The Alliance has the following objectives:

- Promote and facilitate the sharing of information, expertise and competencies to effect responsible fishing practices.

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<sup>124</sup> (FAO, 2003)

<sup>125</sup> FAO. Global forest resources assessment 2005. Thematic study on mangroves-Somalia Country profile. FAO. Rome

<sup>126</sup> (FAO, 2005)

<sup>127</sup> [www.rfalliance.org.za](http://www.rfalliance.org.za) NOTE: This is focussed on fisheries on the West Coast of South Africa, so not in the WIO region. But provides a good example which could perhaps be emulated.



- Influence policy and fishery governance.
- Develop the skills of fishers and fisheries managers to implement an EAF.
- Promote and implement independent high-quality research on the implementation of an EAF.
- Effective engagement with market mechanisms (e.g. Southern African Sustainable Seafood Initiative, Marine Stewardship Council and retailers).
- Positioning responsible fisheries in the public space.

A number of projects have been undertaken under the umbrella of the RFA including:

- The adoption of seabird mitigation measures across all 15 vessel types belonging to RFA members;
- A study of bycatch in the inshore trawl fishery, with the goal of improving bycatch management in this fishery;
- A review of the Offshore Resources Observer Programme;
- The testing of new seabird scaring devices which are designed to further reduce interactions between trawl gear and seabirds.

In addition, a Code of Conduct for responsible fisheries in South African waters has been developed. This is being implemented in the demersal and small pelagic sectors.

The **Marine Stewardship Council (MSC)** is an independent non-profit organization which sets standards for sustainable fishing. Fisheries that wish to demonstrate they are well-managed and sustainable compared to the science-based MSC standard are assessed by a team of experts who are independent of both the fishery and the MSC. Seafood products can display the blue MSC ecolabel only if that seafood can be traced back through the supply chain to a fishery that has been certified against the MSC standard.

The mission of the MSC is to use its ecolabel, for which the MSC receives royalties for licensing it to products, and fishery certification program to contribute to the health of the world's oceans by recognizing and rewarding sustainable fishing practices, influencing the choices people make when buying seafood, and working with partners to transform the seafood market to a sustainable basis. Another organisation, the **Aquaculture Stewardship Council**, promotes and certifies sustainable aquaculture. The MSC is working with small scale fisheries operators and other stakeholders in its Fish for Good project, through which selected fisheries in South Africa, Indonesia and Mexico use the MSC sustainability criteria as a framework within which to structure improvement activities, opening the potential for future certification. Mapping and gap analysis based on the MSC Fisheries Standard is used to identify areas where sustainability improvements can be made. A pre-assessment of nine fisheries in South Africa led to the selection of further activities in five fisheries, namely yellowfin tuna, albacore tuna, East Coast rock lobster, mussel and squid.

## Programmes Related to EAF

The **Southern Indian Ocean Deepsea Fishers Association (SIODFA)** was formed in 2006 by the four companies that were active in the deep-sea high-seas fisheries of the Southern Indian Ocean at the time. The objectives of the Association included the promotion of responsible management of the deepwater fishery resources of the Southern Indian Ocean to ensure sustained harvests while conserving biodiversity, especially deepwater benthos in the area of the fishery and associated and dependent species. SIODFA has signed a Memorandum of Understanding with the International Union for the Conservation of Nature (IUCN) to cooperate in investigating, developing and promoting appropriate means of deep-sea resources management, including mitigation of adverse impact of fishing activities on the marine environment and non-targeted species, based on the FAO Code of Conduct for the management of deep-sea fisheries in the high seas; to exchange views and work together for sustainable development of fisheries using e.g., Benthic Protected Areas and an Ecosystem Approach; and to develop and reinforce communication partnerships and links between the marine environment and those involved in these fisheries. In July 2006, SIODFA decided to refrain voluntarily from bottom trawl fishing in 11 deep-sea areas in order to protect cold-water corals.

The **Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA Marine Turtle MoU)** puts in place a framework through which States, territories, inter- and non-governmental stakeholders of the Indian Ocean and South-East Asian region, as well as other concerned States, can work together to conserve marine turtle populations and their habitats for which they share responsibility. This objective can be achieved most effectively through the collective implementation of the IOSEA Conservation and Management Plan (CMP). IOSEA supports the development of national networks through which government, NGOs, community organizations and the private sector can cooperate and coordinate efforts to protect marine turtles. Country reports to IOSEA have documented several examples of private sector contributions to turtle conservation through supporting research, protecting nesting sites, financial contributions to NGOs engaged in turtle conservation, etc.

The South African inshore trawl sector through its industry body – the South East Coast Industrial Fishing Association (SECIFA) – has worked closely with scientists from the University of Cape Town to improve the data recording and management of 10 bycatch species in the sector. These 10 species, together with the target species of hake and sole, make up approximately 95% of the total catch in the sector. As a result of this Fishery Conservation Project (FCP), SECIFA is now monitoring its catches of these 10 bycatch species on a monthly basis and has agreed to test out strategies of keeping members within annual catch limits for these species. This partnership has also included South Africa's Department of Agriculture,

Forestry and Fisheries (DAFF) and NGOs such as WWF and the Responsible Fisheries Alliance (RFA).

### Research Initiatives Related to EAF

Implementation of the EAF includes the adoption of mitigation measures to address some of the impacts of fisheries – for instance, bycatch of seabirds or dolphins. In the WIO region, a number of mitigation measures have been investigated over the years. For example:

- The **BYCAM** project was initiated in 2015. It is funded by WIOMSA and involves various researchers, fisheries managers, fishers, and government and non-government representatives. The aim of the initiative is: *“To assess bycatch and redevelop economically viable methods for mitigation of non-target mega-fauna species bycatch (retained or discarded) in artisanal/small-scale commercial gillnets (drift-and bottom sets), longlines, and semi-industrial prawn trawl fisheries in the WIO”*.<sup>128</sup>
- Research was undertaken to assess the effectiveness of using acoustic alarms to reduce dolphin bycatch in both drift and bottom-set gillnets. However, the reduction was only significant in the drift gillnets.<sup>129</sup>

### 5.3 Initiatives to Address Illegal Fishing

**Stop Illegal Fishing** is an NGO based in Botswana that works with a variety of partners to address illegal fishing in African waters. Stop Illegal Fishing has cooperated with private sector operators such as Trygg Mat Tracking to monitor and coordinate responses to illegal fishing operators. It has also developed an Industry Charter of Commitments to Stop Illegal Fishing, which was developed in close consultation with fishing companies and other stakeholders.

### 5.4 Market Access and Governance Initiatives

**Blue Ventures** is an NGO that aims to develop transformative approaches for catalysing and sustaining locally led marine conservation. They have partnered with a range of government, academic, civil society and local community organizations. They have also worked closely with the private sector, specifically Copefrito and Indian Ocean Trepang, through which they are supporting conservation practices, effective management and marketing of octopus fisheries, as well as supporting the development of community-lead seaweed and sea cucumber farms.

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<sup>128</sup> Available at: <https://bycamwio.weebly.com/about-bycam.html>

<sup>129</sup> Amir, O.A., 2010. Biology, ecology and anthropogenic threats of Indo-Pacific bottlenose dolphins in east Africa. PhD Thesis: Stockholm University, Sweden.

## 5.5 Clean Technologies – Seafood Processing

Clean technologies are measures that are introduced into industrial or manufacturing processes which promote more efficient use of raw materials, substitute chemicals for alternatives that are less hazardous, modify processes to increase opportunities for recycling, and which reduce waste.

The biggest environmental threats posed by food processing – including seafood processing – are:

- High water usage;
- The generation of large quantities of wastewater containing high levels of organic materials, suspended solids and nutrients; and
- Odour emissions.

Between 1999 and 2004 DANIDA<sup>130</sup> sponsored a project “Cleaner Production in the South African Fishing Industry” in collaboration with the South African Pelagic Fisheries Producers Association (SAPFPA), a number of companies involved in fish processing in the Western Cape, as well as FIRI (the Fishing Industries Research Institute). The primary objectives of this partnership were to implement cleaner production methods in the white fish and canning industries with a view to reducing freshwater consumption and to reduce the organic content of the effluent.

## 5.6 Pollution Control on Ships

The control of pollution from ships has become increasingly strict over the years with the development and entry into force of a number of new provisions and/or new legal instruments under the IMO. This has increased pressure on the industry to develop cleaner and energy efficient vessels.<sup>131</sup>

This has given rise to a number of partnerships between IMO and the global shipping industry aimed at supporting implementation of these new measures. The Global Industry Alliance (GIA) to Support Low Carbon Shipping<sup>132</sup>, for example, is a public-private partnership between IMO and a number of leading maritime companies – including shipowners and operators, classification societies, engine and technology builders and suppliers, big data providers, oil companies and ports - under the framework of the GEF-UNDP-IMO GloMEEP Project. The objective of the alliance is to identify and develop innovative solutions to address barriers to the uptake and implementation of energy efficiency technologies and operational measures. The companies involved include some which operate in the WIO region.

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<sup>130</sup> The Danish International Development Agency

<sup>131</sup> UNCTAD (2019) *Review of Maritime Transport 2019*. UN Publication 2019.132pp.

<sup>132</sup> Available at: <https://glomeep.imo.org/global-industry-alliance/global-industry-alliance-gia/>

The IMO and Norway also launched the Green Voyage 2050 in 2019. This is intended to promote global efforts to demonstrate and test technical solutions for reducing greenhouse gas (GHG) emissions from ships, and to continue building capacity in developing countries. Strategic partners from the private sector are expected to contribute expertise and experience.

## 5.7 Alien Species Control on Ships

Shipping is one of the main pathways for the translocation of marine species from one part of the world to another. Such translocation is a consequence of hull-fouling and ballast water uptake and discharge. Concern over the potential impacts of these species led to the development of the Ballast Water Management Convention and the IMO Guidelines on the Management of Hull-fouling.

In order to support the implementation of the Convention and Guidelines, the IMO developed two GEF-funded projects in collaboration with the UNDP, namely GloBallast Partnerships<sup>133</sup> and GloFouling. Both of these have seen the establishment of Global Industry Alliances:

- GloBallast Partnerships (2007 – 2017) had a significant Public-Private Sector Partnership component with private sector participation facilitated through the Global Industry Alliance (GIA) and GIA Fund. Partners included major maritime companies such as Keppel Offshore and Marine and APL.
- GloFouling (2019 – 2023) is focused on the transfer of harmful aquatic species through biofouling in certain developing regions of the world (GEF-UNDP-IMO). One of the five major components of the work is public-private partnerships to bring active private sector participation at global, regional, national and local levels, to support the development of innovative technological and other solutions and financial sustainability for the control and management of biofouling. An example of such activities is the seminar on **Biofouling Management & Prevention which was hosted in 2019 by Lloyd’s Maritime Academy in collaboration with the WOC** to discuss the next steps, best practices and latest solutions for invasive species and biofouling control. The **Global Industry Alliance (GIA) for Marine Biosafety**, launched in June 2020, is designed as a partnership of leadership companies from industries affected by biofouling, e.g. shipping, aquaculture, offshore oil & gas, offshore renewable energy. The World Ocean Council (WOC) is the lead partner for engaging the ocean business and investment community in the 5-year GEF-UNDP-IMO GloFouling Partnerships Project. The WOC is pulling

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<sup>133</sup> This followed the original GloBallast Project.

together Biofouling Best Management Practices for a range of industry sectors and will be organizing events to foster and facilitate investment in solutions to biofouling.

## **5.8 Research and Information Sharing Partnerships**

The Offshore Oil and Gas Environmental Research Collaboration Project was a project to implement South Africa's Operation Phakisa's Offshore Oil and Gas Exploration Initiative B3: Exploiting the broader research opportunities presented by offshore oil and gas exploration. This was achieved through the establishment of the South African Marine Research and Exploration Forum (SAMREF) on 29 January 2016. At the SAMREF launch ceremony, the Department of Science and Technology (DST) and the Offshore Petroleum Association of South Africa (OPASA) signed a Memorandum of Understanding to facilitate the goals of SAMREF, which are to:

- Identify and take advantage of opportunities provided by oil and gas exploration activities and platforms, to gather important marine ecosystem data which would otherwise be difficult and expensive to obtain.
- Facilitate new collaborative offshore studies that would increase South Africa's state of knowledge of the offshore marine environment, related to renewable energy potential, marine biodiversity and ecology, climate change and ecosystem functioning.

Industry vessels and fixed platforms frequently put to sea and hence have the capacity to obtain and share such data. In turn, the marine research community has the knowledge and willingness to work with industry in order to get maximum potential from the data they are collecting. SAMREF is open to all marine/maritime industries that collect data offshore, but primarily the oil and gas industry, all marine related research institutions and universities (SAEON, SAIAB, SANBI) and government departments/parastatals (DSI, DFFE, DMR, SAWS, CSIR).

## **5.9 Oil Spill Contingency Planning**

The Nairobi Convention includes a Protocol concerning Co-operation in Combating Pollution in Cases of Emergency in the Eastern African Region (1985) the main objective of which is to facilitate the development of regional arrangements for the effective combating of major spillages of oil or other harmful substances from ships. Other obligations in terms of the Protocol include:

- The development of national contingency plans and pollution response capabilities;
- The distribution of information to the other Parties regarding their national organization and their competent national authorities;
- Informing the other Parties of all pollution incidents; and
- The provision of assistance to a Party which so requests.

A draft Regional Contingency Plan was developed under the WIO Marine Highway Project.<sup>134</sup> According to the draft plan: *“The purpose of the Regional Contingency Plan is to establish, within the framework of the Emergency Protocol and according to the obligations of the Contracting Parties under this Protocol, a mechanism for mutual assistance, under which the competent national Authorities of the countries concerned will co-operate in order to co-ordinate and integrate their response to marine pollution incidents either affecting or likely to affect the territorial sea, coasts and related interests of one or more of these countries, or to incidents surpassing the available response capacity of each of these countries alone.”*

The plan hinges on the establishment of a Regional Coordination Centre (RCC) for Marine Pollution Preparedness and Response in the Western Indian Ocean. The Centre will act as the Secretariat for the plan and be responsible for its ongoing maintenance. The Centre has been designed, but is yet to become operational.

The Global Initiative – an alliance between IMO and IPIECA (the global oil and gas industry association for environmental and social issues) - aims to develop global oil spill preparedness and response capacity. Other projects include the Global Initiative for West, Central and Southern Africa (GI WACAF Project), GI SEA and GI China.

## 5.10 Marine Plastics

The objective of the African Marine Waste Network, an initiative of the Sustainable Seas Trust, is to serve coastal and island African States by developing an active consortium of people and organisations working together within countries and across borders to help African people develop and implement better waste management strategies. The African Marine Waste Network includes private sector partners such as PETCO, PlasticsSA and Polyco.

## 5.11 Ecosystem Restoration and Payment for Ecosystem Services

Mikoko Pamoja is the first community-based project of this kind in the world to successfully trade mangrove carbon credits.<sup>135</sup> Communities protect and restore mangroves and in turn sell the carbon credits to international buyers. This revenue then goes into financing forest protection and restoration, and to other community-chosen projects.<sup>136</sup> The project supports

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<sup>134</sup> World Bank (2013). Implementation Completion and Results Report: GEF Western Indian Ocean Marine Highway Development and Marine Contamination Prevention Project. World Bank Report No. ICR 2568. Africa

<sup>135</sup> Mikoko Pamoja Blue Forests – People & Mangroves Together [video], Kenya: 2017. <http://www.planvivo.org/project-network/mikoko-pamoja-kenya/>

<sup>136</sup> SAIIA, *Marine and Coastal Ecosystem-based Adaptation for enhanced resilience in Southern Africa*, 2019.

community development projects such as provision of schoolbooks, construction of school buildings and the provision of clean drinking water.<sup>137</sup>

The project is managed locally by the Mikoko Pamoja Community Organisation, which consists of staff from the Kenya Marine and Fisheries Research Institute (KMFRI), KFS, a representative of the Tidal Forests of Kenya Project and a representative of the community organisation. Carbon-offset projects are complex and require a rigorous scientific basis to determine carbon stocks and baselines, as well as a range of technical expertise. KMFRI has provided this support in collaboration with a range of international researchers. The Association for Coastal Ecosystem Services, a charity registered in Scotland, also helps to facilitate the transfer of international funds, reporting to the Plan Vivo Foundation.

Mikoko Pamoja has received a lot of international attention and was awarded the prestigious UN Development Programme's Equator Prize in 2017 for its contribution to finding innovative solutions to tackle poverty, the environment and climate change. Mikoko Pamoja is currently being replicated on Kenya's south coast at Vanga.

## **5.12 Sustainable Tourism**

The tourism sector is highly complex with a range of different private sector players providing services for different components, from travel and accommodation to tour guides and operators who offer opportunities to experience a variety of specific attractions. In coastal areas such attractions can include, for example, diving on coral reefs to whale and dolphin watching all of which pose some form of threat to the environment. There are, therefore a wide variety of initiatives aimed at promoting sustainable tourism.

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<sup>137</sup> Mikoko Pamoja Blue Forests – People & Mangroves Together [video], Kenya: 2017. <http://www.planvivo.org/project-network/mikoko-pamoja-kenya/>



Figure 4: Components of the Tourism Industry



## Partnerships

The Global Sustainable Tourism Council (GSTC) is an international body which promotes the adoption of universal sustainable tourism principles and practices. They have established criteria and indicators for various components of the tourism industry (e.g. Tour Operators) with themes including sustainability planning; social and economic benefits for the local community; cultural heritage; and environmental impacts (including consumption of resources, reducing pollution, and conserving biodiversity and landscapes).<sup>138</sup>

GSTC Members from the WIO region include:

- Ecotourism Kenya: promotes sustainable tourism through the incorporation and recognition of environmentally and socially sound practices such as the integration of communities and community based tourism enterprises into mainstream tourism, promotion of best practices in tourism accommodation facilities through an eco-labelling scheme, and a mentorship program to mentor students in the tourism field.<sup>139</sup>
- Green Tourism Active (GT-Active) is based in South Africa. It is an assessment and certification organisation with a focus on environmental, socio-economic, cultural and conservation performance and compliance with the GSTC criteria.<sup>140</sup>
- The Seychelles Sustainable Tourism Foundation is an NGO which acts as a platform for tourism stakeholders in Seychelles, facilitating partnerships and joint initiatives

<sup>138</sup> Available at: <https://www.gstcouncil.org/>. For example, the GSTC Criteria and Indicators for Hotels can be viewed at <https://www.gstcouncil.org/wp-content/uploads/GSTC-Industry-Criteria-for-Hotels-with-indicators-Dec-2016.pdf>

<sup>139</sup> Available at: <https://ecotourismkenya.org/>

<sup>140</sup> Available at: <http://www.gt-active.org>

for sustainable tourism. It promotes an integrated collaborative approach between public, private sector, academia and NGOs with an action plan is based on the GSTC criteria.<sup>141</sup>

- The Tourism Environment Charter: launched in Mauritius in 2002 by the Association of Hoteliers and Restaurants, AHRIM, with the assistance of the GEF Small Grants Programme. This charter is a voluntary corporate responsibility with the commitment to achieve environmental protection and sustainable development. The charter aims to make environmental protection an integral part of the daily management of hotels and other tourism operators. It also aims to create awareness to minimise environmental impacts and it encourages hotel and tourism stakeholders to work towards environmental certification standards.

## Projects

Chumbe Island Coral Park Ltd. (CHICOP) is an award-winning private nature reserve that was developed from 1991 for the conservation and sustainable management of uninhabited Chumbe Island off Zanzibar. The reserve includes a fully protected Coral Reef Sanctuary and Forest Reserve that harbour rare wildlife, a Visitor and Education centre, a small eco-lodge, nature walks and historical monuments. All buildings and operations are based on state-of-the-art eco-technology aiming at zero impact on the environment (rainwater catchment, photovoltaic energy and solar water heating, composting toilets, vegetative greywater filtration etc.). The company objectives are non-commercial, while operations follow commercial principles. The overall aim of CHICOP is to create a model of financially and ecologically sustainable park management, where ecotourism supports conservation, research and comprehensive Environmental Education programmes for local schools and other benefits for local people. In 2011, Chumbe Island became the first Global Ecosphere Retreat (GER) certified Long Run Destination through the Jochen Zeitz Foundation which means that Chumbe strives for the highest standards in sustainability through the balance of conservation and commerce, whilst fostering community development and cultural stewardship. Chumbe's sustainable management and promotion of key ecosystem services for the region has since been recognized on many levels, including being mentioned in the UN Secretary General's report to the General Assembly on protection of coral reefs for sustainable livelihoods and development.

In 2016 the Indian Ocean Rim Association partnered with the International Whaling Commission to establish the IORA Sustainable Whale and Dolphin Watching Tourism Network. Bringing together countries of the Indian Ocean to work collaboratively and share

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<sup>141</sup> Available at: <http://seychellessustainable.org>

best practice, the Network aims to set an international gold standard in sustainable whale watching. The network is led by regional institutions and government representatives, but seeks to engage with private sector whale and dolphin watching tourism operators.

In Kenya, several local hotels are cooperating with the NGO Local Ocean Conservation to monitor and protect turtle breeding sites on the beaches of Diani and Watamu.

There are also a number of coastal ecotourism projects which have been established in the WIO region. They include:

- The women in Gazi, a coastal village in Kenya, established a community- based ecotourism project by constructing a boardwalk in the adjacent mangrove forest. The project was undertaken in collaboration with international funders and KMFRI;<sup>142</sup>
- There are a number of operators offering whale and dolphin watching activities in the region, especially in Mauritius and Zanzibar. It is noted, however, that there is evidence that this may lead to behavioural changes in dolphins
- Coral reefs in the Dar es Salaam Marine Reserve System have, since 1999 formed the basis of a community ecotourism project which is combined with restoration and provides a source of income for the local community.<sup>143</sup>

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<sup>142</sup> Regional State of the Coast Report: Western Indian Ocean Region, (2015). UNEP.

<sup>143</sup> Wagner, G.M. (2004). Coral Reefs and Their Management in Tanzania. Western Indian Ocean J. Mar .Sci. 3(2)

## 6. Conclusions and Recommendations

The review of the legal and policy context for private sector engagement in LME management and conservation conducted as part of this assessment clearly establishes that such involvement is widely supported by global, regional and national policy frameworks. As outlined in the preceding section, the private sector is already involved through a variety of modalities in ecosystem management and conservation. Furthermore, the review of key maritime sectors highlighted that these sectors all impact the marine environment in different ways and to varying degrees. These dynamics emerge from the characteristics of the industry itself, as well as the extent to which these are established (e.g. capture fisheries, shipping, oil and gas) or emerging sectors (e.g. coastal and offshore renewable energy).

If private sector partnerships are to be effective, it is essential that collaboration between the private sector and other governance actors (governments, civil society, regional institutions, etc) holds **mutual benefit** for all actors involved. Though there are numerous examples of effective private sector partnerships related to marine ecosystem management and conservation, there are equally a great number of initiatives and programmes that have highlighted private sector partnerships as an important objective, yet achieved limited results in this area – many MOUs have resulted in little or no subsequent joint action. A stronger focus on ensuring that proposed partnerships deliver value to all parties will support more credible commitments and the achievement of more tangible results from such partnerships.

Strategic engagement with the private sector will require prioritisation of partners and interventions among the wide range of potential collaboration opportunities. This section outlines suggested criteria to inform such prioritisation.

Factors to be considered in identifying priority sectors/partners:

- Level of stress placed on the WIO LME
- Potential for change based on proven commitment and ability to change
- Potential contribution to SDGs and Agenda 2030
- Support for NC/SAPPHIRE's work programme/objectives
- Availability of resources and solutions (best practice)
- Engagement in research and innovation
- Investment in inclusive and sustainable economic activities
- Size of entity (preferable to have a range from micro to multinational)

Based on the above factors, it is suggested that the Strategy focuses initially on the following economic sectors:

- Fisheries (including capture fisheries, mariculture, and seafood processing)
- Extractive industries (Oil & gas, coastal and offshore mining)
- Tourism and recreation
- Shipping and ports (including shipbuilding and repair).

In addition, given the importance of long-term monitoring of ecosystem-related indicators and ocean-climate observations for the ongoing sustainable management of the WIO, the strategy will also look at partnerships around research and monitoring – both within the scope of partnerships linked to the priority economic sectors and possibly as partnerships focussed on research and monitoring (of which there are already a number of examples).

Partnerships may be designed around one or more of the following objectives:

- Information sharing (including identification and sharing of best practice practice)
- Joint research and ecosystem monitoring
- Promoting the adoption of joint standards (including through certification, branding, industry charters, etc)
- Training and skills development
- Incentives to support behavioural change
- The implementation of demonstration projects

Consideration should further be given to the scale, scope and type of partnerships that may be appropriate. For example, while partnerships focused on communication or standard-setting may benefit by including a wide range of actors (an alliance approach), projects that seek more tangible outcomes may benefit from a more focused, incremental approach with a select group of private sector operators with the will and the means to engage actively on partnership objectives. Certain more broad-ranging partnerships could take a cross-sectoral approach, while others may require targeted interventions within a specific sector (such as fisheries or seabed and coastal mining).

The private sector can play a variety of roles within partnerships, and should not necessarily be limited to the provision of financing. It is important that the role of the private sector is carefully considered and clearly articulated within the design of partnerships. Examples include:

- Provision of funding (e.g. CSR/CSI, contributions from private foundations, etc)
- In kind contribution of staff and/or equipment
- Sharing of information
- Adoption/mainstreaming of standards, best practice guidelines, governance approaches (e.g. EAF), or technologies/practices (e.g. equipment changes to reduce bycatch, clean technologies to reduce pollution, etc).
- Joint implementation of demonstration projects

### **Private Sector Representative Organizations**

Private sector representative organizations (e.g. business councils and industry associations) are well positioned to coordinate engagement between the private sector and other

governance actors related to LME management and conservation. This is particularly important for sectors such as fisheries and tourism that are characterised by a large number of individual actors. In some cases, industry associations are already coordinating the development and/or implementation of best practice guidelines or other protocols specific to the dynamics of the sector or sub-sector they represent. Partnerships with private sector representative organizations may be particularly suited where such partnerships are focused primarily on information sharing or promotion of industry standards.

### **Partnering with Individual Companies**

Partnering with a company or a select group of companies may be appropriate where such partnerships are focused on the development and implementation of demonstration projects. In such cases, a focus on replicability and scalability of such demonstration projects can support wider adoption in subsequent phases of the partnership.

Other factors that may support a focus on partnerships with individual companies include:

- Sectors characterised by individual companies of significant scale (e.g. oil and gas, the larger coastal mining projects)
- Individual companies where there are not appropriate representative associations (e.g. while mining companies are represented by national and regional chambers of mines, there is not an industry body representing actors involved in coastal and seabed mining specifically)
- Individual companies that have made significant commitments or shown keen interest in partnerships related to marine and coastal conservation and protection (leading regional good practice).

### **Ensure Inclusion of Small-scale Associations or Networks**

Working with representative organizations is particularly important to support engagement with **small-scale operators in maritime sectors** as, in addition to the constraint of a vast number of geographically dispersed operators, effective engagement with individual small scale operators is also hampered by the fact that they typically have less resources, limited access to communication technologies and face a range of other constraints that hamper effective engagement at national and regional levels. Within the fisheries and aquaculture sector, for example, it is suggested that a key partner may be the **Eastern Africa Fisheries Non-State Actors' Platform**. Such collaboration could also involve lesson-sharing and cooperation with other regional small-scale fisheries networks, working with institutional partners such as AU-IBAR, AUDA-NEPAD, WorldFish and the FAO.<sup>144</sup>

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<sup>144</sup> Available at: <https://www.au-ibar.org/2012-10-01-13-08-42/press-releases/415-fish/1103-communicue-workshop-on-the-establishment-of-the-east-africa-platform-of-non-state-actors-in-fisheries-and-aquaculture-sector-earfish>. And <http://blog.worldfishcenter.org/2019/08/raising-a-unified-voice/>

Consideration should be given to the objectives of partnerships with small-scale / SME associations or networks. These actors are generally not in a position to contribute financially to partnerships, but they could play an important role in promoting the adoption of standards related to marine and coastal conservation and protection.

### **Consideration of Women and Youth**

A number of private sector associations or networks have been established to represent stakeholder categories that have traditionally been marginalised, including women and youth. While these associations or networks are primarily focused on supporting and promoting the interests of stakeholders that fall within their area of focus, potential collaboration in the area of marine and coastal ecosystem conservation and protection may be explored. These networks are also relevant for information dissemination activities at national and regional level.

Within the fisheries sector there are existing associations focused on women operators, such as the Tanzania Women Fish Workers Association (TAWFA) or the National Network of Women Fishers of Madagascar (RENAFEP Mada). Regionally, these networks are coordinated through the **African Women Fish Processors and Traders Network (AWFISHNET)**. Within the shipping sector, a potential partner may be **Association of Women Managers in the Maritime Sector in Eastern and Southern Africa (WOMESA)**.

### **Leverage Existing Initiatives by Institutional Partners**

A range of global and regional institutions are engaged with private sector-oriented programmes and projects within specific maritime sectors in the WIO region. In this regard, it will be important that duplication is avoided, and synergies are taken advantage of. In addition to engagements directly with private sector operators (individual operators and representative organizations), consultation with key institutional stakeholders will therefore also be important. These stakeholders include Africa regional institutions (e.g. AU-IBAR, AUDA-NEPAD), regional economic communities (e.g. SADC, EAC), UN agencies (e.g. IMO, FAO, UNWTO, etc), financing institutions (e.g. AfDB, DBSA), major research institutions and programmes (e.g. WorldFish), and others.

### **Representative Organizations for the Broader Business Community**

It has been suggested that strategic engagement with the private sector focuses on specific sectors (fisheries, extractive industries, tourism, and shipping and ports). It must be recognized, however, that the marine and coastal environment is impacted by broader economic activities and actors. A range of regional associations and business councils exist that represent industry broadly. These could be important avenues for information sharing, even while strategic partnership efforts are focused on particular maritime sectors. Examples

of potential partners in this regard include regional organizations such as the East African Business Council, the SADC Business Council, the Association of SADC Chambers of Commerce and Industry, the COMESA Business Council; the *Cap Business Océan Indien*, and the Indian Ocean Business Forum, as well as national organizations such as the Tanzanian National Business Council.

The **World Ocean Council** operates across a range of sectors, engaging in a variety of global and regional ocean governance forums, and includes within its membership private sector operators active in the WIO region. Given its position in representing private sector actors across a range of maritime industries, the WOC could potentially play a valuable role in facilitating private sector partnerships in the region, for example, through the establishment of a regional ocean council for the WIO region.

This assessment provides an overview of the scope of key maritime industries in the WIO region, including the identification of key stakeholders, an assessment of their environmental impact, and a review of private sector efforts towards marine conservation and protection initiatives. The recommendations of the assessment will inform the development of a private sector engagement strategy for the region in response to WIO LME SAPPHIRE's commitment to work with the private sector to mainstream ecosystem-based management in their operations and management practices.



## Annex A: Key Relevant International Treaties

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International Convention for the Regulation of Whaling, 1946

International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969

Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil thereof, 1971

Convention on Wetlands of International Importance Especially as Waterfowl Habitat of 1971 (Ramsar)

Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), 1973

Convention for the Safety of Life at Sea (SOLAS), 1974

International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (1973; MARPOL 73/78)

Convention on the Conservation of Migratory Species of Wild Animals (CMS), its regional and species related agreements of 1979 (Bonn Convention)

United Nations Convention on the Law of the Sea (UNCLOS), 1982

Convention on the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region and related protocols (Nairobi Convention), 1985

International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969

Protocol of 1976 to amend the CLC (PROT-CLC), 1976

Vienna Convention for the Protection of the Ozone Layer, 1985

Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer (1987)

Basel Convention on the Control of Transboundary Movement of Hazardous Wastes, 1989

Bamako Convention on the Ban of the import into Africa and the control of transboundary movement and management of hazardous wastes within Africa, 1991

United Nations Framework Convention on Climate Change (UNFCCC), 1992 UNFCCC Protocol, Kyoto, 1997 Paris Agreement 2015

Convention on Biological Diversity (CBD) of 1992

Bonn Convention on Migratory Species (CMS), 1994

Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Straddling Fish Stock Agreement)

Stockholm Convention on Persistent Organic Pollutants, 2001

African Convention for the Conservation of Nature and Natural Resources (Algiers Convention), 1968; Revised African Convention (Algiers Convention), 2003

International Convention on Oil Pollution Preparedness, Response and Cooperation (1990 - OPRC)

Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances (2000 - HNS Protocol):

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972 - The London Convention) London Protocol entered into force 2006

Basel, Rotterdam and Stockholm Conventions (BRS)

Benguela Current Convention Entered into force 2015

Minamata Convention on Mercury Entered into force - 2017

International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention) Entered into force 2017

International Convention on the Control of Harmful Anti-fouling Systems on Ships Entered into force 2009

## Annex B: Relevant Country Projects

ANNEX B: RELEVANT COUNTRY PROJECTS	
COUNTRY	PROJECTS <sup>145</sup>
<b>Comoros</b>	<ul style="list-style-type: none"> <li>• <u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></li> <li>• <u>Development of a National Network of Terrestrial and Marine Protected Areas Representative of the Comoros Unique Natural Heritage and Co-managed with Local Village Communities</u></li> <li>• <u>First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish 1)</u></li> <li>• <u>Implementing Integrated Water Resource and Wastewater Management in Atlantic and Indian Ocean SIDS</u></li> <li>• <u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></li> <li>• <u>LME-AF Strategic Partnership for Sustainable Fisheries Management in the Large Marine Ecosystems in Africa (PROGRAM)</u></li> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> <li>• <u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></li> <li>• <u>Western Indian Ocean Islands Oil Spill Contingency Planning</u></li> <li>• <u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></li> <li>• <u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></li> </ul>
<b>Kenya</b>	<ul style="list-style-type: none"> <li>• <u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></li> <li>• <u>Demonstrating and Capturing Best Practices and Technologies for the Reduction of Land-sourced Impacts Resulting from Coastal Tourism (COAST)</u></li> <li>• <u>Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa (CMEA)</u></li> <li>• <u>Enhancing Conjunctive Management of Surface and Groundwater Resources in Selected Transboundary Aquifers: Case Study for Selected Shared Groundwater Bodies in the Nile Basin</u></li> <li>• <u>Flood and Drought Management Tools</u></li> </ul>

<sup>145</sup> Source: <https://iwlearn.net/iw-projects/countries>

	<ul style="list-style-type: none"> <li>• <a href="#"><u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></a></li> <li>• <a href="#"><u>Kenya Coastal Development Project</u></a></li> <li>• <a href="#"><u>Lake Victoria Environmental Management</u></a></li> <li>• <a href="#"><u>Lake Victoria Environmental Management Programme Phase 3</u></a></li> <li>• <a href="#"><u>Mainstreaming Groundwater Considerations into the Integrated Management of the Nile River Basin</u></a></li> <li>• <a href="#"><u>Nile Transboundary Environmental Action Project, Phase I</u></a></li> <li>• <a href="#"><u>Nile Transboundary Environmental Action Project, Tranche 2</u></a></li> <li>• <a href="#"><u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></a></li> <li>• <a href="#"><u>SIP-Equatorial Africa Deposition Network (EADN)</u></a></li> <li>• <a href="#"><u>SIP-Lake Victoria Environmental Management Project II</u></a></li> <li>• <a href="#"><u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></a></li> <li>• <a href="#"><u>Transboundary Diagnostic Analysis and Strategic Action Program Development for the Lake Victoria Basin</u></a></li> <li>• <a href="#"><u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPHIRE) Project</u></a></li> <li>• <a href="#"><u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></a></li> </ul>
<b>Madagascar</b>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></a></li> <li>• <a href="#"><u>Enhancing the Conservation Effectiveness of Seagrass Ecosystems Supporting Globally Significant Populations of Dugong Across the Indian and Pacific Ocean Basins (Short Title: The Dugong and Seagrass Conservation Project)</u></a></li> <li>• <a href="#"><u>Expanding and Consolidating Madagascar's Marine Protected Areas Network</u></a></li> <li>• <a href="#"><u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></a></li> <li>• <a href="#"><u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></a></li> <li>• <a href="#"><u>S3MR Sustainable Management of Madagascar's Marine Resources</u></a></li> <li>• <a href="#"><u>Second South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish2)</u></a></li> <li>• <a href="#"><u>Western Indian Ocean Islands Oil Spill Contingency Planning</u></a></li> <li>• <a href="#"><u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPHIRE) Project</u></a></li> <li>• <a href="#"><u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></a></li> </ul>
<b>Mauritius</b>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></a></li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></li> <li>• <u>Implementing Integrated Water Resource and Wastewater Management in Atlantic and Indian Ocean SIDS</u></li> <li>• <u>Mainstreaming Biodiversity into the Management of the Coastal Zone in the Republic of Mauritius</u></li> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> <li>• <u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></li> <li>• <u>Western Indian Ocean Islands Oil Spill Contingency Planning</u></li> <li>• <u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></li> <li>• <u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></li> </ul>
<p><b>Mozambique</b></p>	<ul style="list-style-type: none"> <li>• <u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></li> <li>• <u>Demonstrating and Capturing Best Practices and Technologies for the Reduction of Land-sourced Impacts Resulting from Coastal Tourism (COAST)</u></li> <li>• <u>Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa (CMEA)</u></li> <li>• <u>Enhancing the Conservation Effectiveness of Seagrass Ecosystems Supporting Globally Significant Populations of Dugong Across the Indian and Pacific Ocean Basins (Short Title: The Dugong and Seagrass Conservation Project)</u></li> <li>• <u>First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish 1)</u></li> <li>• <u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></li> <li>• <u>Integrated Transboundary River Basin Management for the Sustainable Development of the Limpopo River Basin</u></li> <li>• <u>LME-AF Strategic Partnership for Sustainable Fisheries Management in the Large Marine Ecosystems in Africa (PROGRAM)</u></li> <li>• <u>Management of Competing Water Uses and Associated Ecosystems in Pungwe, Busi and Save Basins</u></li> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> <li>• <u>SIP-Equatorial Africa Deposition Network (EADN)</u></li> <li>• <u>Southern African Development Community - SADC - Groundwater and Drought Management Project</u></li> <li>• <u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></li> <li>• <u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></li> <li>• <u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></li> </ul>

<p><b>Seychelles</b></p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>A Ridge-to-Reef Approach for the Integrated Management of Marine, Coastal and Terrestrial Ecosystems in the Seychelles</u></a></li> <li>• <a href="#"><u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></a></li> <li>• <a href="#"><u>Demonstrating and Capturing Best Practices and Technologies for the Reduction of Land-sourced Impacts Resulting from Coastal Tourism (COAST)</u></a></li> <li>• <a href="#"><u>Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa (CMEA)</u></a></li> <li>• <a href="#"><u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></a></li> <li>• <a href="#"><u>Implementing Integrated Water Resource and Wastewater Management in Atlantic and Indian Ocean SIDS</u></a></li> <li>• <a href="#"><u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></a></li> <li>• <a href="#"><u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></a></li> <li>• <a href="#"><u>Sustainable Groundwater Management in SADC Member States</u></a></li> <li>• <a href="#"><u>Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3)</u></a></li> <li>• <a href="#"><u>Western Indian Ocean Islands Oil Spill Contingency Planning</u></a></li> <li>• <a href="#"><u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></a></li> <li>• <a href="#"><u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></a></li> </ul>
<p><b>Somalia</b></p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></a></li> <li>• <a href="#"><u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></a></li> </ul>
<p><b>South Africa</b></p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></a></li> <li>• <a href="#"><u>Building Partnerships to Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water (GloBallast Partnerships)</u></a></li> <li>• <a href="#"><u>Development and Adoption of a Strategic Action Program for Balancing Water Uses and Sustainable Natural Resource Management in the Orange-Senqu River Transboundary Basin</u></a></li> <li>• <a href="#"><u>Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa (CMEA)</u></a></li> <li>• <a href="#"><u>Distance Learning and Information Sharing Tool for the Benguela Coastal Areas (DLIST-Benguela)</u></a></li> <li>• <a href="#"><u>Enhancing Climate Change Resilience in the Benguela Current Fisheries System</u></a></li> <li>• <a href="#"><u>Implementation of the Benguela Current LME Action Program for Restoring Depleted Fisheries and Reducing Coastal Resources Degradation</u></a></li> <li>• <a href="#"><u>Implementation of the Strategic Action Programme (SAP) Toward Achievement of the Integrated Management of the Benguela Current Large Marine Ecosystem (LME)</u></a></li> <li>• <a href="#"><u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></a></li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Integrated Transboundary River Basin Management for the Sustainable Development of the Limpopo River Basin</u></li> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> <li>• <u>Realizing the Inclusive and Sustainable Development in the BCLME Region through the Improved Ocean Governance and the Integrated Management of Ocean Use and Marine Resources</u></li> <li>• <u>Southern African Development Community - SADC - Groundwater and Drought Management Project</u></li> <li>• <u>Southwest Indian Ocean Fisheries Project (SWIOFP)</u></li> <li>• <u>Strengthening Capacity for International Cooperation in the Ecosystem-based Management of the Antarctic Large Marine Ecosystem</u></li> <li>• <u>Support to the Orange-Senqu River Strategic Action Programme Implementation</u></li> <li>• <u>Sustainable Groundwater Management in SADC Member States</u></li> <li>• <u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></li> <li>• <u>Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project</u></li> </ul>
<p><b>Tanzania</b></p>	<ul style="list-style-type: none"> <li>• <u>Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)</u></li> <li>• <u>Demonstrating and Capturing Best Practices and Technologies for the Reduction of Land-sourced Impacts Resulting from Coastal Tourism (COAST)</u></li> <li>• <u>Enhancing Conjunctive Management of Surface and Groundwater Resources in Selected Transboundary Aquifers: Case Study for Selected Shared Groundwater Bodies in the Nile Basin</u></li> <li>• <u>First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish 1)</u></li> <li>• <u>Flood and Drought Management Tools</u></li> <li>• <u>Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIOSAP) project</u></li> <li>• <u>Lake Victoria Environmental Management</u></li> <li>• <u>Lake Victoria Environmental Management Programme Phase 3</u></li> <li>• <u>LME-AF Strategic Partnership for Sustainable Fisheries Management in the Large Marine Ecosystems in Africa (PROGRAM)</u></li> <li>• <u>Mainstreaming Groundwater Considerations into the Integrated Management of the Nile River Basin</u></li> <li>• <u>Marine and Coastal Environment Management Project (MACEMP)</u></li> <li>• <u>Nile Transboundary Environmental Action Project, Phase I</u></li> <li>• <u>Nile Transboundary Environmental Action Project, Tranche 2</u></li> <li>• <u>Partnership Interventions for the Implementation of the Strategic Action Programme (SAP) for Lake Tanganyika</u></li> <li>• <u>Pollution Control and Other Measures to Protect Biodiversity of Lake Tanganyika (LTBP)</u></li> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Removal of Barriers to the Introduction of Cleaner Artisanal Mining and Extraction Technologies</u></li> <li>• <u>Safeguarding Zanzibar's Forest and Coastal Habitats for Multiple Benefits</u></li> <li>• <u>SIP-Equatorial Africa Deposition Network (EADN)</u></li> <li>• <u>SIP-Lake Victoria Environmental Management Project II</u></li> <li>• <u>Western Indian Ocean LMEs Strategic Action Programme Policy Harmonization and Institutional Reforms (WIO LME SAPPHIRE) Project</u></li> </ul>
<p><b>Reunion</b></p>	<ul style="list-style-type: none"> <li>• <u>Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLME)</u></li> </ul>



## Annex C: Resource Mobilization Options

Financial resource mobilization exists along a spectrum of types of capital. At one end of the spectrum is philanthropy, while commercial finance lies at the other end and is driven mainly by the potential for profit or financial return.

Historically, the private sector's involvement was mostly in the form of Corporate Social Responsibility (CSR), an obligation often prescribed by national legislation.

The private sector is moving towards business models which attempt to incorporate sustainability as a central tenet to their own objectives, providing greater room for engagement.<sup>146</sup>

Existing capital flows must be redirected towards improved ocean governance and sustainable blue economies.

To improve private sector engagement, mainstream finance must be understood – this means that the types and sources of investment capital must be used in the correct context and appropriate investment models examined.

### *Main Capital Types*

Engagement with the private sector to mobilize financial resources can be done by using various capital types. The type of capital provided depends on the willingness of the investors to encounter risk and what is expected as a return. For instance, non-financial return, scale, and level of impact are also considerations determining the capital types and sources mobilized.

It is further important to differentiate between established sectors of the blue economy, where the trend is to redirect commercial capital towards sustainable activities, and emerging sectors with new investment capital. Typically, emerging sectors receive funding mostly from philanthropy and official development assistance. However, more recently, new funds have increased from venture capital and impact investment<sup>147</sup>, while larger-scale investments, like blue bonds (which are not universally applicable) are the exception, not the rule.

Capital types can roughly be grouped as follows: impact-only money (public financing, official development assistance, philanthropic grants); debt (loans and bonds); and equity (public equity, equity investment). These types of capital can be mobilized through a variety of investment models. Grouped in the same manner, these include bank loans and project bonds as the more common examples of mainstream finance, while conservation trust funds, impact bonds and crowd financing are more innovative ways of mobilizing financial resources.<sup>148</sup> Focus should be given to seed investment in promising start-ups, impact investing in commodities, and the development of conservation trust funds for projects based on natural capital approaches.

The following section examines the role of debt and equity as types of financial resources from the private sector and includes a brief reference to investment models that can be considered.

#### ➤ Impact only

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<sup>146</sup> UNEP Policy Coordination Unit (February 2020) "United Nations Environment Programme Strategy for South-South and Triangular Cooperation" 26pp at 14.

<sup>147</sup> De Vos K., Hart B., Ryan K., et al (2020) "The Ocean Finance Handbook Increasing finance for a healthy ocean" 113pp at 7.

<sup>148</sup> De Vos K., Hart B., Ryan K., et al (2020) "The Ocean Finance Handbook Increasing finance for a healthy ocean" 113pp at 67.

- Grant financing, often from philanthropic sources (high net worth individuals and philanthropic foundations) as well as official development assistance and corporations, are often aimed at a specific idea that the donor wants to execute.
  - CSR investment provides a good opportunity to build internal stewardship of environmental objectives over the longer term as part of the private sector's profit and social motivations. CSR is often linked to a company's supply chain, i.e. fishing, shipping, aquaculture and waste management, creating the potential for CSR investment in all sectors in the Western Indian Ocean. The consumer goods company Mars, for instance, invests in coral reef rehabilitation. This is an important CSR investment for the company not only for conservation but because of the role that coral reefs play as nursery grounds for fisheries like tuna, which Mars sources for its pet care division. Not only does this reduce the private sector's long-term exposure to risk, it is also an indirect return on investment. CSR can also be a way for the private sector to build new markets for their products through investing in activities such as infrastructure or capacity building. CSR activities in the blue economy often focus on supply chain interventions and opportunities to scale-up existing supply chain investments and new areas of investment. To ensure private sector engagement through CSR, it is important to identify private sector stakeholders who operate within the WIO region or who have vested interests in the region, either by means of social, economic or cultural interest. Countries should also receive support to improve donor engagement by underlining the importance of the ocean as the "World's Lungs" and their (and our collective) reliance on its continued health. Meetings should be set up with high level CSR representatives, cases/rationale should be provided for support, and there should be engagement on project co-creation opportunities.
- Debt instruments (loans and bond)
- Generally, these types of instruments are low-risk, low-reward and provides a certain level of freedom to all parties.
  - More recently, standards for green and sustainable investments have been implemented for debt instruments.
  - Debt models include microfinance loans, revolving loan funds, bank loans, conservation impact bonds, project bonds and sovereign bonds.
  - Conservation impact bonds, or environmental impact bonds, for example, are financial packages where private capital is mobilized for a conservation project against agreed measurable conservation outcomes. The investor is then repaid once the agreed conservation outcomes are verified.
- Equity
- In this instance, the private sector, ranging from an impact investor to a venture capitalist, invests by taking an ownership stake in an investment. There are different types and scale of equity investments, ranging from high-risk, high-reward venture capital to buying shares in an asset. Equity is broadly divided into publicly or privately-traded equity. The nature of publicly-traded equity allows investors, once they own a specific percentage of shares of a company, to influence the company's performance and how it is being run. This is an enabling option for "activist investors" – those who bought the shares with the aim of redirecting performance changes towards sustainability.

- Furthermore, various environmental standards and principles are aimed towards public equity investments because they build on existing reporting requirements. An example is the Principles for Responsible Investment and the Task Force on Climate Related Disclosures (TCFD). TCFD-based reporting became mandatory for all Principles for Responsible Investments (PRI) signatories in 2020.
- Larger and more established sectors like tourism, energy, shipping, and the industrial end of the fishing sector are more likely to be publicly traded. Where the private sector is involved in smaller sectors focused on ecosystem services or conservation, companies often tend to be privately held and do not trade publicly.<sup>149</sup>

### *Equity Models Including Impact Investing, Seed Financing and Crowd Investment*

Hybrid models include Conservation Trust Funds, Carbon credit schemes and Debt swaps. An example is the Quintana Roo Trust, a coastal zone management trust established in Mexico through a multi-sector partnership involving state government, local hotel owners and The Nature Conservancy (TNC). The trust fund receives taxes from the tourism industry and local governments for the protection of coral reefs through continuous maintenance and the buying of reef insurance. Reef damage, suffered after storm surges, are repaired by using money paid out by the insurance policy. The trust fund will also support ongoing maintenance of the reef and beaches, both before and after storm events. There is considerable scope for financing and scaling opportunities around nature-based resilience to protect natural infrastructure like wetlands and reefs. This is a foundational part of how the industry models, manages, transfers and finances the risks brought with climate change.

## Sources of Capital flows

Private finance is often provided from the following sources: equity investors, impact investors, venture capitalists, commercial banks, pension funds and new and innovative sources like crowd funding.

- Impact investors:
  - In addition to wanting a financial return on their investments, impact investors also seek social and/or environmental returns.
  - Investment can be through both equity and lending, and often it will be used in a single project to achieve a desirable risk-adjusted return.
  - These types of investments will be focused on a specific sector, like fisheries or protected areas, often with a specific purpose.
  - Generally, impact investors are willing to invest from US\$500,000 upwards in a project. To date, these investments in the blue economy space have been fairly small. This is not due to a lack of interest, but rather because of the lack of available projects with a sufficiently attractive investment proposition – either they are too high-risk for impact investors or, more frequently, their funding requirements are too small even for impact funds.

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<sup>149</sup> De Vos K., Hart B., Ryan K., et al (2020) "The Ocean Finance Handbook Increasing finance for a healthy ocean" 113pp at 55.

➤ Venture capitalists:

- Venture capitalists often invest in a wide variety of products or projects, often in the same sector.
- In the context of the blue economy, venture capitalists can assist with mobilizing capital towards new start-ups and in ocean technology investments. Examples include venture capital investment in renewable energy projects or robotic monitoring of ecosystems. Venture capital can mobilize financial flow to many projects at once, hoping that one of these projects has the potential to succeed and transform the industry.
- By definition, investment in the blue economy values impact and change, which results in an overlap between venture capitalists and impact investors. Additional venture capital has been mobilized by joining impact-oriented venture capital with other tools to enable investments, such as project accelerators or “blue clusters”.

The Iceland Ocean Cluster operates a business cluster with select member businesses. It is an example of how to create value by connecting entrepreneurs, businesses and knowledge in marine industries while providing a range of services and investing resources in new marine spin-offs and projects. One of the projects initiated through the Icelandic Ocean Cluster is the Green Marine Technology Initiative, a joint marketing effort of ten Icelandic technology firms that provide eco-friendly and cost saving technology solutions for fishing and fish processing.

The Katapult Ocean’s accelerator programme is both an early-stage impact investor and accelerator for blue economy projects based in Oslo, Norway with a global focus. With a broad range of investors, research institutions, and partners (the World Wildlife Fund Norway is a founding partner, for example), the programme includes investment opportunities in technology-based projects in renewables, shipping, fisheries, aquaculture, ocean health (including waste), and the circular economy. Its focus is mainly on large technological innovations in the blue economy. It recently closed its first investment fund at US\$ 4 million, targeting investments in 24 blue economy start-ups. It has plans to scale up to an additional 40 start-ups through a new fund.<sup>150</sup>

An example of an African-based initiative that provides a platform for entrepreneurs to collaborate and access resources is the Ocean Hub Africa. It was launched early 2020 and is based in Cape Town. Ocean Hub Africa is an ocean-impact catalyser with the aim to accelerate “African ocean-minded” start-ups. This hub brings main ocean economy actors together and assists start-ups accepted into its programme with the mobilization of resources, including working space, access to mentors, expertise and market leads.

➤ Commercial banks:

- Commercial banks lend money to private businesses across different sectors which can mobilize financial resources in various ways, from project finance to construction and operating finance to re-financing.
- Dutch commercial banks have been noted as particularly focused on investing in elements of the sustainable blue economy, with ASN Bank, Triodos, Rabobank and ABN AMRO identified in an EU mapping exercise (European Commission, 2018).

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<sup>150</sup> De Vos K., Hart B., Ryan K., et al (2020) “The Ocean Finance Handbook Increasing finance for a healthy ocean” 113pp at 47.

Others, such as Standard Chartered and Credit Suisse, have been pioneers in mapping out the potential investment opportunities in the blue economy space or providing some of the aforementioned banking services in early examples of blue economy investment models, such as the Seychelles Blue Bond.

## Resource Mobilization from Diverse Sources

It is also important to develop a framework for more efficient resource mobilization from diverse sources. Important target groups for micro-investments include corporates and individuals, including high net worth persons and foundations.<sup>151</sup> Approaches could include:

- Creating systematic engagement to ensure the steady flow of resource mobilization;
- Approaching foundations and high net worth individuals with aligned interests to build upon common values and thematic areas of mutual interests;
- Benchmarking against the activities and functionalities of other UN organizations and agencies;
- Fundraising from this target group by means of establishing a central coordination point for foundations or high net worth individuals;
- Developing a consistent approach for member-based alliance and partnerships fora, initiatives, networks, and platforms;
- Charging membership fees for member-based fora, initiatives, networks, and platforms aimed at covering the costs of the operations. This would help to create financial independence; improve transparency towards private sector partners; streamline internal procedures; enhance efficiency; and increase benefits for all parties from the engagement.

## New and Innovative Approaches

Innovation is one of the parameters that guides the UN Funding Compact. Consideration of new and innovative approaches should be incorporated in the manner in which small-scale enterprises are engaged. Mechanisms include voluntary contributions, such as:

- Pledge giving:
  - Individuals or small-scale enterprises provide funds on a monthly basis throughout the year. One mechanism is through a direct debit facility. It is a predictable and sustainable source of private sector income. In certain instances, a tax rebate could be applicable.
- Legacy giving:
  - Legacies, or bequests, are funds or assets that individuals leave in their wills. They provide a high long-term return on investment and are a significant source of regular resources.

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<sup>151</sup> E.g. Global Environment and Technology Foundation, Pew Charitable Trusts

- A strong private sector fundraising track record should include large databases of supporters in various countries, together with increasingly wealthy ageing populations. This creates growth potential in the area of a bequest.
- Individual giving:
  - Social media and online and mobile payments allow for crowdfunding and remove barriers of entry for individual giving.
  - While this is not a reliable source of investment, it can address the “missing middle” – the gap between microfinance, typically less than US\$50,000 and impact investments larger than US\$500,000 – of which there are many in the blue economy.

## Non-financial Resources

To further accelerate the transition to an inclusive and sustainable economy, focus must also be placed on the mobilization of non-financial contributions from the private sector. This includes innovation, technological expertise, human and logistical resources. Often, non-financial contributions will support a specific project or activity which reflects an area of shared interest between the private sector and stakeholders.

By mobilizing non-financial contributions and investing in communities and the environment through people, time, and energy, the private sector further contributes to corporate responsibility and to meeting their obligations undertaken as signatories to global compacts.

Non-financial contributions and possibilities for engagement with the private sector include:

### *Technical Expertise and Innovation*

- Engagement with the private sector based on specific project needs and areas of shared interest, in particular, areas where the technical expertise of the private sector will be needed for successful implementation.
- Provision from the private sector of expertise and knowledge to assist projects and programmes to enhance practices and develop solutions.
- The designing of products and services that appeal to other investors, thereby further supporting resource mobilization and helping to build and support the blue economy.
- Examples include: co-creation of product innovation or innovative solutions; ocean innovation hub/ incubator / accelerator platforms.

### *Human Resources*

- Deployment of staff from the private sector to support implementation of projects and campaigns.
- Appointment of “Blue Ambassadors” that champion the needs of WIO communities within the private sector and its networks to enable greater support.

- Other options include business advisory services, corporate staff secondment, feasibility studies, implementation and evaluation activities.

### *Logistical Resources*

- Hosting meetings, events and workshops, providing venues and logistical support.
- Arranging campaigns.