ROCKING THE BOAT
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean
ROCKING THE BOAT

The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean
United Nations Economic Commission for Africa and Indian Ocean Commission, 2022

Cover photo credit: Getty Images/ Suriyapong Thongsawang

Kigali, Rwanda

All rights reserved.

The material in this publication may be freely quoted or reprinted. Acknowledgement is requested, together with a copy of the publication.

The designations employed in this publication and the material presented in it do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Economic Commission for Africa concerning the legal status of any country, territory, city, or area or its authorities, or concerning the delimitation of its frontiers or boundaries.
Acknowledgements

Rocking the Boat: The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean is a product of the United Nations Economic Commission for Africa, Sub-Regional Office for Eastern Africa (UNECA SRO-EA). It was requested by and produced in collaboration with the Maritime Security (MASE) Programme for Eastern and Southern Africa and Indian Ocean, through the Indian Ocean Commission (IOC).

This study was conceptualized and developed, under the guidance of Mama Keita, Director of UNECA SRO-EA, and Raj Mohabeer, Chargé de Mission of the IOC and Coordinator of MASE Programme. It was managed by Raquel Frederick, Associate Economic Affairs Officer, UNECA, and Abdoul-had Ahmed Mouhoussoune, Deputy Director, Regional Coordination Operation Centre (RCOC). The study was authored by Maisie Pigeon (Maritime Security Consultant, Lead Author) and Philippe Lallemand (Independent International Consultant).

We would like to thank the staff of UNECA and the MASE Programme for their support. This report would not have been possible without the substantive contributions of the following collaborators and reviewers:

- Raquel Frederick, UNECA
- Honita Cowaloosur, UNECA
- Raj Mohabeer, IOC Coordinator of MASE Programme
- Hassani Ahamada Soilihi, IOC Maritime Expert
- Navi Ramgolam, Deputy Director, Regional Maritime Information Fusion Centre (RMIFC)
- Abdoul-had Ahmed Mouhoussoune, Deputy Directeur, RCOC
- Nelson Delicieux, RCOC ILO Madagascar
- Houmed Ismael Kako, RCOC ILO Djibouti
- Outam Kumar Guness, RCOC ILO Mauritius
- Romain Salmon, RCOC ILO France
- Major Renny Bulmer, RCOC ILO United Kingdom
- Said Lavani, RMIFC ILO Comoros
- Christopher Jilo, RMIFC ILO Kenya
- Nicolas Flury, RMIFC ILO France
- Major Antonio Gomme, RMIFC ILO Seychelles
- Aro Tiana Ramanantsoa, RMIFC ILO Madagascar

Comments received from Jean-Paul Adam, Director, Louis Mitondo Lubango, Environmental Affairs Officer, Deka Moussa Ragueh, Regional Advisor, and staff of the Technology, Climate Change and Natural Resources Division of UNECA, as part of the internal peer review process, are acknowledged with appreciation.

Many thanks to the following officials for the valuable data and analysis provided: Mialítiana Razafindralambo (Chef de Service des Statistiques des Echanges et Services dans la Direction des Statistiques Economiques, Madagascar Institut National de la Statistique); Mathew Collins Omondi (Director, Macroeconomic Statistics, Kenya National Bureau of Statistics (KNBS)); Anthony Makau (Trade Statistician, KNBS); and Bhavna Ramjus (Senior Statistical Officer, Statistics Mauritius).

We also thank the team at Epsilon Publishers for the editing, translation, and publishing of this report.
Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

Ariel view of boats, Mont Choisy beach, north-west coast, Mauritius
Credit: Getty Images/Roberto Moiola/Sysaworld
4.6 Other Regional Efforts to Curb IUU Fishing and Overfishing 97

5 Conclusions and Recommendations 102

5.1 A Holistic View of Maritime Security 104
5.2 Addressing Limited Resources and Assets 105
5.3 Multi-Agency and Multinational Communication 106
5.4 Addressing IUU Fishing and Adapting to Climate Change 107
5.5 Ensuring the Sustainability of the MASE Centres 109

6 References 112

7 Annexes 122

7.1 IMO’s Conventions and the WIO States 122
7.2 Oil Spill Response Arrangements & Resources by WIO Country 123
7.3 Fishing Intensity in the WIO region 124

List of Case Studies

Case Study 1: Ahlu Sunna Wal Jama, Northern Mozambique 63
Case Study 2: Exxon Valdez oil spill in Alaska, USA 71
Case Study 3: Wakashio oil spill in Mauritius 71
List of Tables

Table 2-1: Share of unreported landed value by the top fishing nations in each EEZ, 2016-2018 average 38
Table 2-2: Total cost of Somali piracy to industry, 2019 50
Table 2-3: Total trafficking incidents in the Western Indian Ocean region, 2019 - 2021 56
Table 2-4: Number of cases of drug seizures in the Indian Ocean region 57
Table 2-5: Illustrative seizures of non-traditional drugs, 2015-2019 59
Table 3-1: Number of maritime incidents related to Yemeni Conflict 82
Table 4-1: Annual cost estimate for full operationalisation of the AMS-I 94
Table 7-1: Selected International Maritime Organisations conventions ratifications/ denunciations by Western Indian Ocean State 122

List of Figures

Figure 1-1: Map of Western Indian Ocean countries covered in this report 25
Figure 1-2: The Seychelles Blue Economy in figures, 2020 28
Figure 1-3: Seaborne share of the value of total Trade, 2019 30
Figure 2-1: Reported versus unreported catch by State, 2018 39
Figure 2-2: Volume of reported and unreported catch in the WIO (metric ton), 2011 – 2020e 40
Figure 2-3: Share of unreported catch value in each fishing sector, 2018 41
Figure 2-4: Distribution of estimated unreported catch by fishing sector, 2018 41
Figure 2-5: Percentage of stock of fish by stock status in Western Indian Ocean, 2000 – 2018 42
Figure 4-1: Maritime Security Programme Architecture 88
Figure 7-1: Summary of oil spill response arrangements by WIO country 123
Figure 7-2: Apparent fishing effort between 1 January and 31 December 31, 2020 124
## Abbreviation and Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AfCFTA</td>
<td>African Continental Free Trade Area</td>
</tr>
<tr>
<td>AIS</td>
<td>Automatic Identification System</td>
</tr>
<tr>
<td>AU</td>
<td>African Union</td>
</tr>
<tr>
<td>AU-IBAR</td>
<td>African Union Inter-African Bureau for Animal Resources</td>
</tr>
<tr>
<td>BEA</td>
<td>Blue Economy in Africa</td>
</tr>
<tr>
<td>BEVTK</td>
<td>Blue Economy Valuation Toolkit</td>
</tr>
<tr>
<td>BIMCO</td>
<td>Baltic and International Maritime Council</td>
</tr>
<tr>
<td>BMP5</td>
<td>Best Management Practices to Deter Piracy and Enhance Maritime Security in the Red Sea, Gulf of Aden, Indian Ocean and Arabian Sea</td>
</tr>
<tr>
<td>CCRF</td>
<td>Code of Conduct for Responsible Fisheries of the Food and Agriculture Organisation of the United Nations</td>
</tr>
<tr>
<td>CDI</td>
<td>Chemical Distribution Institute</td>
</tr>
<tr>
<td>CGPCS</td>
<td>Contact Group on Piracy off the Coast of Somalia</td>
</tr>
<tr>
<td>CIF</td>
<td>Cost Insurance and Freight</td>
</tr>
<tr>
<td>CLIA</td>
<td>Cruise Lines International Association</td>
</tr>
<tr>
<td>CLC</td>
<td>International Convention on Civil Liability for Oil Pollution Damage</td>
</tr>
<tr>
<td>COLREG</td>
<td>Convention on the International Regulations for Preventing Collisions at Sea</td>
</tr>
<tr>
<td>CRF</td>
<td>Croix-Rouge Française</td>
</tr>
<tr>
<td>DCOC</td>
<td>Djibouti Code of Conduct</td>
</tr>
<tr>
<td>EAC</td>
<td>East African Community</td>
</tr>
<tr>
<td>EA-SA-IO</td>
<td>Eastern African-Southern African-Indian Ocean</td>
</tr>
<tr>
<td>ECA</td>
<td>Economic Commission for Africa</td>
</tr>
<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU NAVFOR</td>
<td>European Union Naval Force</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation of the United Nations</td>
</tr>
<tr>
<td>FiTI</td>
<td>Fisheries Transparency Initiative</td>
</tr>
<tr>
<td>FOB</td>
<td>Free on Board</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GFW</td>
<td>Global Fishing Watch</td>
</tr>
<tr>
<td>GIA</td>
<td>Global Industry Alliance</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>GI</td>
<td>Global Initiative</td>
</tr>
<tr>
<td>GISIS</td>
<td>Global Integrated Shipping Information System</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
</tr>
<tr>
<td>HNS</td>
<td>Hazardous and Noxious Substances</td>
</tr>
<tr>
<td>HRAS</td>
<td>Human Rights at Sea</td>
</tr>
<tr>
<td>ICC</td>
<td>International Chamber of Commerce</td>
</tr>
<tr>
<td>ICC CCS</td>
<td>International Chamber of Commerce, Commercial Crime Services</td>
</tr>
<tr>
<td>ICC IMB</td>
<td>International Chamber of Commerce, International Maritime Bureau</td>
</tr>
<tr>
<td>ICC IMB PRC</td>
<td>ICC IMB, Piracy Reporting Centre</td>
</tr>
<tr>
<td>ICJ</td>
<td>International Court of Justice</td>
</tr>
<tr>
<td>ICS</td>
<td>International Chamber of Shipping</td>
</tr>
<tr>
<td>ICZM</td>
<td>Integrated Coastal Zone Management</td>
</tr>
<tr>
<td>IDRL</td>
<td>International Disaster Relief Law</td>
</tr>
<tr>
<td>IFSMA</td>
<td>International Federation of Shipmasters’ Associations</td>
</tr>
<tr>
<td>IGP&amp;I</td>
<td>International Group of P&amp;I Clubs</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>IMTS2010</td>
<td>International Merchandise Trade Statistics: Concepts and Definitions 2010</td>
</tr>
<tr>
<td>INTERPOL</td>
<td>International Criminal Police Organisation</td>
</tr>
<tr>
<td>IOC</td>
<td>Indian Ocean Commission</td>
</tr>
<tr>
<td>IORA</td>
<td>Indian Ocean Rim Association</td>
</tr>
<tr>
<td>ISA</td>
<td>International Seabed Authority</td>
</tr>
<tr>
<td>ISS</td>
<td>Institute for Security Studies</td>
</tr>
<tr>
<td>ITC</td>
<td>International Convention on Tonnage Measurements of Ships</td>
</tr>
<tr>
<td>ITOPF</td>
<td>International Tanker Owners Pollution Federation Limited</td>
</tr>
<tr>
<td>IUU</td>
<td>Illegal, Unreported and Unregulated</td>
</tr>
<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
</tr>
<tr>
<td>LLP</td>
<td>Lessons Learned Project</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships</td>
</tr>
<tr>
<td>MASE</td>
<td>Maritime Security Programme</td>
</tr>
<tr>
<td>MDA</td>
<td>Maritime Domain Awareness</td>
</tr>
<tr>
<td>MoT</td>
<td>Mode of Transport</td>
</tr>
</tbody>
</table>
MSCHOA  Maritime Security Centre, Horn of Africa
MSC  Marine Stewardship Council
NOAA  National Oceanic and Atmospheric Administration
OPRC  Convention on Oil Pollution Preparedness, Response and Co-operation
ORF  Observer Research Foundation,
PPP  Public-Private Partnerships
PSMA  Port State Measures Agreement
RAV  Record of Authorised Vessels
RCOC  Regional Coordination Operations Centre
RECOMAP  Regional Coastal Management Programme
RFMO  Regional Fisheries Management Organisations
RMIFC  Regional Maritime Information Fusion Centre
SAU  Sea Around Us
SDG  Sustainable Development Goal
SIF  Stop Illegal Fishing
SNA  System of National Accounts
SOLAS  International Convention for The Safety of Life at Sea
SRO-EA  Sub-Regional Office for Eastern Africa
SSF  Small Scale Fishery(ies)
STCW  International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
UN  United Nations
UNCTAD  United Nations Conference on Trade and Development
UNECA  United Nations Economic Commission for Africa
UNECA SRO-EA  United Nations Economic Commission for Africa, Sub-Regional Office for Eastern Africa
UNODC  United Nations Office on Drugs and Crime
USD  United States Dollar
VOI  Vessel of Interest
WFP  World Food Programme
WIO  Western Indian Ocean
WWF  World Wildlife Fund
Foreword

Healthy and safe oceans are essential to growth and sustainable development. Reliable access to maritime resources provides much of the world’s population with food and livelihood and facilitates a large and increasingly diverse range of economic activities. For centuries, coastal and island countries in Eastern Africa and the Western Indian Ocean (WIO) have exploited maritime ecosystem resources and built connectivity into the global trade system. Maritime activities demonstrate strong growth prospects in the region if maritime assets are secured and managed sustainably.

The annual output of maritime activities in WIO was estimated at USD20.8 billion in 2015, primarily through coastal tourism, carbon sequestration, and fisheries (WWF, 2017). Coastal tourism is a major source of employment and foreign exchange for small island economies such as Comoros, Mauritius, Seychelles, and Zanzibar. The annual tuna catch in the Indian Ocean represents 20-24% of the global market supply (WWF, 2017). From the East African seaboard to the most remote WIO islands, the region’s offshore oil and gas potential is under exploration (Collins, 2020). The Northern Mozambique Channel supports 30% of global tanker traffic (UNEP, 2015). Investments in Djibouti’s port and subsea network have helped position it as a major logistics and trade hub for the Horn of Africa. Similarly, Dar es Salaam, Mombasa, and Durban are critical gateways to East, Central, and Southern Africa.

Juxtaposed with this vast socio-economic potential is a confluence of human activities and natural calamities that undermine the safety and security of the waters in the region. Maritime crimes such as piracy, and resource over-exploitation activities such as illegal, unreported, and unregulated fishing, threaten this potential. Furthermore, many countries on the coast of East and Southern Africa serve as a source, trans-shipment point, and/or destination, for the trafficking of humans, drugs, weapons, and other illicit goods. While these threats impose significant direct costs for countries in the region, it is the indirect costs that constitute the heaviest part of the burden. Insecurity constrains the ability of maritime industries to address larger development priorities such as poverty reduction, food security, and opportunities for economic growth. As fishing and trade are compromised, their costs increase and result in an erosion of the purchasing power of domestic consumers. Countries also suffer from loss of economic opportunities when local and foreign investors are discouraged from exploring new industries due to insecurity at sea.

A regional approach is necessary for securing the safety and sustainability of maritime activity. Although the capacity of each State to counteract maritime threats at national level varies, their overall potential remains low. However, multi-country collaborations, such as the Maritime Security Programme (MASE), have been very successful in contributing to an improved maritime security through enhanced monitoring, control, surveillance, and information sharing. These efforts have enabled an expansion of regional trade, heightened global security, and contributed to creating a favourable environment for regional economic development. It is imperative that we build on this momentum.
Against this backdrop, we welcome this report, Rocking the Boat: The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean, jointly published by the United Nations Economic Commission of Africa (UNECA) and the Maritime Security (MASE) Programme for Eastern and Southern Africa and Indian Ocean. As the report notes, measurable losses associated with maritime threats may cost the region over USD 11 billion annually – approximately 5% of regional GDP. This is a gross understatement of the full costs, as so much of the socio-economic impact discussed in the report, is unmeasurable. The situation on the coast and in the ocean has greatly improved in recent years. However, insecurity, as well as many of the underlying factors driving these threats, persist. The positive trends can easily be compromised, or even reversed if there is reduced or unsustainable vigilance.

The key takeaway from this report is that: the burden of maritime insecurity is shared by all countries in the region. As such, continued collaboration is necessary, and is the most effective approach to addressing these threats.

We hope that this report sheds light and facilitates discussion on the need for countries in the region and other partners to maintain and increase investment in the security of the maritime space.
Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

Nosy Komba, Madagascar
Credit: Getty Images/Kamil Sztandera
EXECUTIVE SUMMARY
Executive Summary

Eastern Africa and the Western Indian Ocean region (WIO) has a rich and diverse Blue Economy which includes many maritime-based sectors that possess the incredible potential to drive regional economic development. For example, over USD 20 billion is earned annually in ocean-related activities in the WIO (WWF, 2017). On average, around 90% of Africa’s trade is done via the sea (AU, 2019). Even though the fishing sector accounts for a relatively small share of regional exports (5% overall, but as high as 18% and 56% in Mauritius and Seychelles respectively (UNCTAD, 2022)), it still provides employment to almost four million East Africans (FAO, 2022). Along with other ocean-based sectors, such as cruise and coastal tourism, aquatic renewable energy, and subsea communications networks, the Eastern African Blue Economy holds much promise to diversify and increase the resilience of regional economies. However, without a secure maritime domain, these sectors are unable to develop sustainably.

An array of maritime threats undermines the growth of Blue Economy sectors in the region. This region was once home to arguably the biggest maritime security threat to the international community in decades, in the form of piracy, off the coast of Somalia. However, as several experts have noted, Somali pirates no longer represent the acute risk to ships transiting the region that they once did. The costs, though substantial at US$156 million in 2019, declined more than 60% since 2017. Today, steady-state threats such as illegal, unreported, and unregulated (IUU) fishing, illicit trafficking of different commodities, and maritime mixed migration represent bigger challenges. Beyond the purely economic cost of maritime crimes and threats, significant social, human, political, and environmental costs, are simultaneously incurred. This report examines the cost of maritime threats on the Eastern African coast and Western Indian Ocean, quantifying direct costs where possible, and discussing the indirect costs associated with social, political, and environmental impact. The quantifiable costs in 2019 were approximately USD11 billion – about 5% of the region’s GDP. Intangible costs, such as the socio-economic losses due to rising drug use or human trafficking, undoubtedly have a larger and more pervasive impact on the region’s wellbeing and development potential. Though unquantifiable, they are critical to consider when valuing the benefits of investing in greater maritime security in the WIO. Thus, the report provides both quantitative and qualitative discussions of the wide-ranging socio-economic impact.
Regional collaborative efforts have been undeniably welcome and effective in boosting the region's maritime security and reducing the reported incidents of certain threats, namely piracy. However, most of the money invested in maritime security initiatives is funneled into temporary projects rather than permanent solutions.

After a brief background that underlines the urgent need for such a study in the region, Chapter One of this report outlines the potential of the Blue Economy in the WIO region. Chapter Two addresses the major maritime threats and their costs to the region. Threats assessed are: IUU fishing; piracy and armed robbery against vessels; illicit trafficking; maritime mixed migration; and environmental disasters and climate change. The chapter describes the current context, recent events, trends, and economic and social implications of each threat to the region.

Chapter Three examines several other threats that merit consideration, despite not yet representing full-blown risks to the region. It alludes to challenges resulting from climate change, crude oil theft, illegal dumping, maritime terrorism, and coastal conflict. It discusses how these threats have manifested in other parts of the world, and why it is in the best interest of the WIO region to consider pre-emptive mitigation before these deviances devolve to crisis level.

Chapter Four describes the organised regional responses to maritime threats, including the programme to promote Maritime Security in the Eastern and Southern Indian Ocean (MASE), the Indian Ocean Forum on Maritime Crime, the Djibouti Code of Conduct, the Regional Coastal Management Programme, and the Indian Ocean Rim Association (IORA).

Chapter Five summarises the findings of the report and draws propositions for the region to collectively improve maritime security moving forward. Below are the recommendations of this report in brief:

- **Taking a Holistic Maritime Security View**: First, the report encourages governments and partners to take a more holistic view of maritime security. Efforts and funding that focus on single-issue challenges leave criminal actors with significant room to adapt their business models and other strategies. Understanding how various maritime crimes and criminal actors interact with one another is critical for more effective and efficient security efforts.

- **Addressing Limited Resources and Assets**: Second, noting that countries suffer from limited resources (including but not confined to financial, human, and technological) and many competing priorities, the report advocates for the pooling of resources and efforts to tackle these threats. The regional agreements under the MASE programme are evidence that such approaches can work and are indeed necessary to ensure maritime security.
Multi-agency and Multinational Communication: Third, the report supports systems that enable cooperation across national agencies and governments throughout the region. For example, the maritime safety mechanism set up within the framework of the MASE agreements includes national centres for collaboration. However, many signatory States of the agreements are yet to create national centres, thus undermining the programme’s overall effectiveness.

Addressing IUU Fishing: As this report will show, one of the most urgent challenges to the region is IUU fishing, which risks the destruction of marine biodiversity, food insecurity, and violence. Both individual governments and the collective region can take action to slow IUU fishing activities in the WIO.

Ensuring the Sustainability of the MASE Centres: Finally, the report calls on States to ramp up combined efforts to sustain the achievements of the MASE Programme, whose mandate and funding are set to expire at the end of 2022. Continuing and fully operationalising the Programme from 2023 would require USD 3.5 million, in addition to country-specific costs for each signatory and host state. However, these costs pale in comparison to the significant economic and social losses that may be deterred through the full operationalisation and strengthening of the MASE Programme Architecture.

The following infographic provides a high-level summary of the situation of maritime security in Eastern Africa and the WIO. Readers are encouraged to seek further detail and nuanced discussion of each modality of this subject in the comprehensive report.
The Eastern African coastline and Western Indian Ocean (WIO) are critical sources or conduits for food, employment, leisure, trade and foreign exchange for countries in the region.

### Production
- **Over US$20.8 billion**
  - Earned annually in ocean-related activities, primarily coastal tourism, carbon sequestration, and fisheries

### Trade
- **At a regional level 90%**
  - Of Africa’s trade goes by sea

### Employment
- **Almost 4 million jobs**
  - Directly and indirectly provided by the regional fishing sector

### Main Threats

#### IUU FISHING
- **Illegal, unreported and unregulated (IUU) fishing conservatively estimated at US$ 11.5 billion annually**
- **Main direct costs:** Unreported catch
- **Socio-economic impacts:** Lost livelihoods for fisheries sector workers; increasing food insecurity; and territorial violence

#### ILLICIT TRAFFICKING
- **Illegal products or legal products traded illegally**
- **WIO nations are origin, transit, and destination countries for drugs, wildlife products, arms, and other contraband**
- **Socio-economic impacts:** Drug addiction/ overdoses overwhelms health systems; loss of human capital and productivity; weapons flow exacerbate existing conflicts and promote violent crime and terrorism

#### PIRACY AND ARMED ROBBERY
- **Direct economic impact:** US$ 156 million annually
- **Main direct costs:** Insurance premiums, private security
- **Socio-economic Impact:** Human cost and violence faced by seafarers; increased cost of insurance fees and traded goods reducing purchasing power of consumers
- **Decline in reported attacks in recent years, but enabling conditions remain largely unchanged**

#### MIXED MIGRATION
- **Human smuggling and trafficking via maritime routes**
- **Main direct costs:** Government spending on preventing and supporting victims; law enforcement and judiciary
- **Socio-economic impacts:** Economic and welfare impacts in host and origin countries
- **Global smuggling market worth:** US$ 5.5 - 7 billion. Migration motivated by conflicts, natural disasters, and poor economic conditions

#### ENVIRONMENTAL DISASTERS
- **80% of global oil exports transit the Indian Ocean, making region vulnerable to spills**
- **Main Economic costs:** Clean-up costs, restoration materials and equipment
- **Socio-economic costs:** Health costs; lost livelihoods; destruction of marine environments; decline in tourism industry and fish stocks, with revenue losses

### Emerging Threats
- Climate Change
- Crude Oil Theft
- Illegal Dumping
- Maritime Terrorism and Coastal Conflicts

### Recommendations

1. **Take a holistic view of maritime security - adopting and supporting efforts that tackle multiple threats**
2. **Boost resources and assets for maritime enforcement, for example, by pooling funding within region**
3. **Enhance multi-agency and multi-national communication and information sharing through security centres**
4. **Strengthen national laws and regional efforts targeting IUU fishing**
5. **Ensure the sustainability of the MASE Centres and their achievements**

Designed by UNECA SRO-EA

Sources: UNECA, AU, IOC, RCOC, RMIFC, WWF
CHAPTER 1

Introduction
1 Introduction

Maritime threats in the Western Indian Ocean region have broad implications that extend well beyond the coast, deep inland. Piracy and armed robbery disrupt global shipping, by which 80% of goods are transported internationally (UNCTAD, 2021). Illegal, unreported, and unregulated fishing can devastate fish stocks, affecting livelihoods and food sustainability. Illicit drugs flood domestic markets, encouraging higher levels of local drug use and dependency. The global demand for illegal wildlife products – most often arriving in destination markets by maritime modes of transport – ravages local populations of beloved species such as African elephants and black rhinos, impacting biodiversity and disrupting the balance of ecosystems of which these large land mammals are essential pieces. Trafficked weapons fuel and exacerbate conflicts. Migrants travelling by maritime routes face a multitude of challenges beyond surviving their perilous journeys. Environmental disasters in the maritime space destroy marine and coastal environments, and spilled oil can leach into food and water supplies. This poses grave public health implications. Climate change heightens the vulnerability of coastal and island communities and economies.

This report seeks to understand the costs associated with the many maritime threats to the WIO region, examining the most pertinent threats to maritime security in the region today in greater detail. The cost of maritime threats is not strictly quantifiable in dollar terms. Insecurity in the maritime domain has proven implications for physical security, sustainable livelihoods, biodiversity, and public health. Moreover, given that many of the maritime crimes discussed in this report are inherently clandestine activities, the full extent of these crimes is not fully documented. In addition, several costs are imminent down the road that the region should acknowledge should it be caught unprepared when crises hit. This report quantifies the economic impact of maritime threats where possible and highlights the socio-economic costs to vulnerable coastal populations and to those whose livelihoods depend on the sea.

This report was produced during the global COVID-19 pandemic. Effects on maritime crimes and threats, the shipping industry, and coastal communities throughout the region of interest continue to evolve. As such, for any quantified estimate, this report uses data from 2019 in an attempt to disaggregate the effects of the pandemic from the effects of any maritime crimes. That said, the COVID-19 pandemic has obviously impacted illicit actors and their business models, as well as legitimate ones. The report will include discussion of such effects where reliable data is available.
1.1 Background

The Eastern Africa and the WIO region, as defined in this report, include the coastal countries of Comoros, Djibouti, Eritrea, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, and Tanzania (Figure 1-1). Altogether, these 10 countries’ Exclusive Economic Zones (EEZs) cover 5,858,622km² and have a total population of 205.6 million.

Figure 1-1: Map of Western Indian Ocean countries covered in this report

Source: Authors
In recent decades, much international attention and funding focused on counterpiracy programming because between 2008-2012, pirates posed a credible threat to international shipping traffic transiting the region. However, the confluence of counterpiracy initiatives – which included international cooperative efforts, sustained naval presence, a robust regional judicial response, and ship protection measures – helped to quell the threat. While incidents of piracy have all but abated, the underlying factors which enabled the piracy business model to thrive in the first place – the so-called “root causes” – remain unchanged on the ground in Somalia.

While piracy activity has been all but eradicated in the region, “[s]everal other maritime security incidents unrelated to piracy were reported in this region in 2019. An attack on a fishing whaler southwest of Mogadishu was claimed by the Somalia-based Islamist insurgent group, Al-Shabaab. Vessels were intercepted and detained by Eritrean forces and the Houthis in the southern Red Sea, and by Iranian forces in the Strait of Hormuz. The Houthis also used remotely controlled water-borne improvised explosive devices against Saudi vessels, and sea mines in their port approaches. Tankers sustained damage from an explosion in the Gulf of Oman and allegedly in the Red Sea, which was related to the conflict between Iran and the Kingdom of Saudi Arabia coalition” (One Earth Future, 2020).

A dispute over claims to maritime territory in the region has embroiled the neighbouring countries of Kenya and Somalia in court proceedings dating back to 2014.¹ In October of 2021, the International Court of Justice (ICJ) ruled largely in Somalia’s favour over roughly 100,000 km² of maritime territory claimed by both countries.² With potential implications for both security and economic interests (the area is thought to be rich in offshore oil and gas deposits)³, the Kenyan government criticised the court’s decision⁴ and has stated publicly that it did not recognise the decision’s findings, saying that it ‘embodies a perpetuation of the ICJ’s jurisdictional overreach and raises a fundamental question on the respect of the sovereignty and consent of States to international judicial processes.’⁵ What follows is uncertain, as the ICJ has no means of enforcing its decision.

Moreover, 2020 saw the largest environmental disaster in the history of Mauritius, with the Wakashio oil spill. This raised questions about the ability of WIO countries to effectively respond to such catastrophes.

Meanwhile, the growing maritime capability was observed from groups like Al-Shabaab in Somalia and Ahlu Sunnah Wa-Jamaa in the Cabo Delgado province of Northern Mozambique. Illegal, unreported, and unregulated fishing remained a

---


⁴ Ibid.

widespread challenge, risking the loss of marine biodiversity and livelihoods to many coastal communities, as foreign fleets were accused of pillaging fish stocks up and down the East African coast. Maritime mixed migration, which refers to the array of motivations and movements of migrants, continued, putting migrants' lives in danger as they traversed perilous maritime routes to reach their intended destinations. This was tragically demonstrated by boats full of migrants capsizing en route to the Arab Peninsula in the Spring of 2021. These incidents illustrate the broader political instability and lack of capacities in the region. These limitations have spilled over into the maritime domain.

The region possesses practically limitless potential to develop blue economy sectors. Simultaneously, it faces a litany of threats, both natural and man-made. Positioned alongside one of the world's most geopolitical shipping chokepoints, this enormous region contains some of the longest coastlines in Africa. These factors make the WIO region more susceptible to a gamut of maritime threats. Moreover, the region remains extremely vulnerable to the effects of climate change, compounding the other threats. Warming ocean temperatures will exacerbate the impacts of overfishing, while both climate-related disasters and conflicts, will spur the migration of people. The effects of some of these imminent threats will reach far beyond the WIO and the effects will be felt around the world. For these reasons, there is an urgent need for the region to develop response plans to cater to a wider array of maritime and coastal threats. For the most part, proactive and long-term programming is currently absent in the region.

The countries of the WIO region have organised around several frameworks to combat maritime insecurity and to address “sea blindness” – both at the national and regional levels. They have been successful in securing the maritime domain but are urgently needed to maintain progress. Threats to maritime security and stability continue to frustrate the region's ability to develop blue economy sectors to their full potential. The millions of people living in the WIO region's coastal areas who stand to profit from such sectors underscore the importance of maritime security initiatives.

1.2 Blue Economy Potential

The importance of blue economy sectors – such as fisheries, tourism, shipping, and maritime transportation and services, mineral exploration, and offshore oil and gas, among others – illustrate the importance and urgency of maritime security efforts in the WIO region. Spanning multiple regions, the Indian Ocean is bordered by 28 countries, "accounting for 35% of the world's population and 19% of global GDP." (IOC, 2020) The 2050 Africa's Integrated Maritime Strategy of the African Union, also known as the AIM Strategy (AU, 2014) emphasizes the African Blue Economy and argues that maritime security challenges are key because they interfere with economic growth. The 2050 AIM Strategy describes maritime security in the following terms:
“The concept of “Maritime Security” will focus on enhancing sustainable socio-economic development, the condition that reflects the freedom of public and private entities to conduct legitimate activities such as the exercise of sovereign and jurisdictional rights, resource extraction, trade, transport, and tourism, free of threats or losses from illegal acts of aggression, for an integrated and prosperous Africa.”

In 2016, UNECA’s Sub-Regional Office for Eastern Africa (SRO-EA) launched the Blue Economy Policy Handbook for Africa (UNECA, 2016a) which proposed a multi-sectoral approach to policy development, linking various blue economy sectors through their economic, social, and environmental dimensions and strengthened synergies. This methodology has been leveraged in recent works, developing blue economy strategies in Comoros, Madagascar, Seychelles, and regionally by the Indian Ocean Commission (IOC), the Intergovernmental Authority on Development (IGAD), and the African Union (AU). More recently, SRO-EA has supported efforts to more accurately measure and value the Blue Economy in the region. Between 2020 and 2021, this involved producing a prototype of the UNECA Blue Economy Valuation Toolkit (BEVTK), and then using it to develop comprehensive socio-economic-ecological assessments of the Blue Economy in two oceanic countries: a small island State (Seychelles) and a coastal-State (Djibouti). To illustrate the importance of the Blue Economy in the WIO, Figure 1-2 presents the main findings from the BEVTK assessment in Seychelles.

Figure 1-2: The Seychelles Blue Economy in Figures, 2020

Even though comprehensive assessments are not available for most countries, it is apparent how vital the Blue Economy is to the sustainable development of coastal and small island economies, global food and energy security, and international commerce. In 2017, WWF estimated the economic value of ocean-related activities to be USD 20.8 billion.6 As significant as this is, it represents only 3.7% of the regional economic activities and only 0.8% of the total global ocean economy, indicating that there is enormous potential for further development of the region’s blue economy. The section below discusses the areas of the region’s blue economy which carry the potential for development and growth.

---

6 Note: The WIO region in WWF’s report represents a slightly different subset of countries (Comoros, Réunion, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa and Tanzania), but the analysis is reflective.
1.2.1 Fisheries for Food Security and Trade

One billion people in developing countries depend on seafood as their primary source of animal protein (Stable Seas, 2020c). Within Eastern Africa and the WIO, fish contributes to more than 20% of the animal protein supply in Comoros, Mozambique, Seychelles, and Tanzania (FAO, 2020). However, these official statistics may underestimate the true importance of the fishing industry due to unreported and subsistence fishing. For example, in Madagascar in 2010, small-scale fisheries alone provided food protein to 99% of households and employed an estimated 87% of the adult population (Barnes-Mauthe, Oleson, & Zafindrasilivonona, 2013).

In addition to contributing to domestic consumption, food security and employment, maritime fisheries represent a critical foreign exchange earner for some countries in the region. For Eritrea, Mauritius, and Seychelles, exports of fish and fish products accounted for 13%, 18%, and 56% (respectively) of total goods exports from 2018 to 2020 (UNCTAD, 2022). Somalia’s fish exports account for less than 10% of total exports, suggesting that there is an opportunity to grow this area of trade. Researchers estimate that the potential value of a well-managed fishing industry in Somalia is over USD380 million annually (Okafor-Yarwood, Kadagi, Belhabib, & Allison, 2022). However, the overexploitation of marine fisheries resources, the impacts of climate change, and maritime crimes such as IUU fishing and piracy and armed robbery at sea can threaten these industries and undermine coastal economies and trade opportunities.
1.2.2 Marine and Coastal Tourism

The WIO region is well endowed with many aquatic-based tourism assets. Many highly sought-after beach destinations have helped to make the regional maritime tourism industry another significant foreign exchange generator. Safe and clean coastlines are therefore essential for the economic stability of small island economies because their beaches are the primary attraction for tourists. For example, in Seychelles, the travel and tourism industry directly accounted for around 40% of total GDP and 42% of total employment before COVID-19. Estimated visitor spending amounted to 45% of total exports (WTTC, 2021). In Comoros and Mauritius, the industry’s contribution to GDP in 2019 was 10% and 20%, respectively.

1.2.3 Maritime Transport

Maritime transport is a pillar of international trade and the global economy. Over 80% of the volume of international trade in goods is carried by sea, and the percentage is higher for most developing countries (UNCTAD, 2021). In Africa, maritime trade facilitates 90% of international trade volumes (AU, 2019). In Eastern Africa, well over three-quarters of the value of trade transit via the WIO, as illustrated by selected countries in Figure 1-3. As the Indian Ocean Commission put it in a 2020 policy brief, “Global trade depends on the WIO’s major maritime routes. At the intersection of Asia, Africa, and Europe, the WIO is of growing importance” (IOC, 2020). However, maritime transport is also a critical conduit for intra-African trade, which is expected to grow significantly over the next few decades.

The African Continental Free Trade Area (AfCFTA) – the largest single market for goods and services – is the AU’s primary strategy to accelerate intra-African trade and leverage trade more effectively as an engine of growth and to strengthen Africa’s common voice in global negotiations. UNECA estimates that by 2040, intra-African trade will be boosted by 15-20% with just the removal of tariffs, or even as high as 40-50% after full implementation of the liberalisation envisioned under the AfCFTA (UNECA, 2015c). Undoubtedly, this would increase demand for all modes of transport, and associated infrastructure and services. More recently, UNECA has forecasted that implementing the AfCFTA would double Africa’s maritime freight, causing higher port traffic in many countries (UNECA, 2022).

Figure 1-3: Seaborne Share of the Value of Total Trade, 2019

![Seaborne Share of the Value of Total Trade, 2019](Source: KNBS (Kenya), INSTAT Madagascar, Statistics Mauritius)
1.2.4 Offshore Oil and Gas

As the demand for fuel increases and the precariousness of global politics makes the case for reduced dependence on selected key suppliers, offshore oil and gas drilling will become more attractive. Currently, “offshore production is an integral part of the world’s oil and gas supply, accounting for more than a quarter of global oil and gas output in 2016” with the Middle East, Brazil, and Mexico as the leading players (IEA, 2018). According to International Energy Agency (IEA), the popularity of offshore wind-generated electricity will also increase in the near future as technologies allow for the erection of bigger turbines. This will in turn increase generation capacity. The potential for offshore generation of fuels in the Indian Ocean has been spattered by the dispute between Kenya and Somalia over the 100,000 km$^2$ of sea which possibly contains gas reserves. However, discoveries of natural gases in Mozambique’s Rovuma Basin and Tanzania renew hope of new frontiers for economic diversification over the East African maritime domain. These discoveries have inspired many countries of the WIO to formulate policy frameworks allowing exploration of oil and gas reserves in their waters by third parties who have the knowledge and capacities in that area. Seychelles and Comoros are such examples.

1.2.5 Minerals Exploration

The Indian Ocean spans over 70.5 million km$^2$. She abounds with unexploited minerals areas, which could ease the pressure of supply from the current mining sites where labour exploitation concerns are recurrent. Decades back, scientists limited deep-sea mining of minerals to near shore and on continental shelf areas, but advanced technology now allows the regulatory body, the International Seabed Authority (ISA), to open seabed areas for exploration of polymetallic nodules and hydrothermal vents at the depth of even 6,000 meters. These polymetallic nodules often contain zinc,
copper, iron, gold, nickel, cobalt, lead, manganese, and platinum. In 2011, the ISA granted China a 15-year license to explore 10,000 km² of the Indian Ocean in search of these minerals. China has since sent autonomous underwater vehicles to explore the Indian Ocean seabed and has confirmed the presence of mineral-rich areas in five specific zones (The Economic Times, 2017). Similarly, ISA granted India a 20-year contract for the exploration of 150,000 km² in the central Indian Ocean basin (The Economic Times, 2016). The mining of these metals is crucial for commercial as well as strategic political purposes.

1.2.6 Bunkering

With the restrictions applied by the International Maritime Organisation (IMO) on the sulphur content in marine bunker fuels, there is global pressure to source cleaner bunker fuel alternatives such as methanol, liquefied natural gas, and ethanol. The newly identified gas reserves in Mozambique hold promise for a lucrative bunkering opportunity to service the 17,031 km of Eastern African coastline.

The threats discussed in this report have the potential to significantly reduce coastal welfare and limit the ability of countries to make the most of the opportunities offered by legal maritime industries as those listed above. As a result, maritime threats can push underemployed communities toward black markets and more transnational maritime crime.
Volunteers clean the ocean coast from oil after a tanker wreck Mauritius
Credit: Shutterstock/ohrim
2 Maritime Security Threats

In present-day WIO region, media stories detail coverage of everything from maritime attacks by Al-Qaeda-affiliated terrorist groups in Somalia and Mozambique, to oil spills, to the pressing threats posed by illegal, unreported, and unregulated fishing targeting highly valuable species in the waters off the East African coast. While piracy and armed robbery may bear some responsibility for initially drawing international attention to maritime security in the region, several other trans-national maritime crimes have begun to garner attention, and arguably, these pose a far greater risk to coastal populations than piracy ever did.

The following sections will explore the status of threats to maritime security in the WIO region, assess their economic and social impacts, evaluate the efforts to combat these threats, and propose the way forward for the region.

2.1 Illegal, Unreported and Unregulated Fishing

Maritime Security Threat #1: ILLEGAL, UNREPORTED AND UNREGULATED (IUU) FISHING

Estimated Annual Economic Impact: $11.5 billion
Direct Costs: Unreported catch
Socio-economic Impact: Lost livelihoods, territorial violence
Primary Victims: Coastal fishers and fisheries sector workers

2.1.1 Current Context

Illegal, unreported, and unregulated (IUU) fishing includes a wide variety of fishing activities that fall under one of three categories, as defined by the UN Food and Agriculture Organisation (FAO):
Illegal fishing is fishing conducted by national or foreign vessels in waters under the jurisdiction of a State without the permission of that State, or in contravention of its national laws and regulations, conservation measures, or international obligations;

Unreported fishing is fishing activities that have not been reported, or have been misreported, to the relevant national authority; and

Unregulated fishing is conducted by vessels without nationality; or by flying a flag of a State not a party to that entity; misidentified nationality; or conducted in areas or for fish stocks for which there are no applicable conservation or management measures, and where such fishing activities are conducted in a manner inconsistent with responsibilities for the conservation of living marine resources under international law.

Illegal, unreported, and unregulated fishing activities also include: “fishing without a license or quota for certain species; failing to report catches or making false reports; keeping undersized fish or fish that are otherwise protected by regulations; fishing in closed areas or during closed seasons, and using prohibited fishing gear; and conducting unauthorized trans-shipments, for example, transfers of fish) to cargo vessels” (NOAA, n.d.).

FAO estimates that global IUU fishing activities cause a loss of 11-26 million tonnes of fish each year – an estimated economic value of USD10-23 billion (UN, 2021). Given the global demand for fishery products, there are clear and significant economic gains to eluding legal catch limits, taxes on the catch, and other constraints or costs of doing business. In addition to profit motivations, IUU fishing can materialise where there is insufficient regulation or low capacity for effective monitoring, control and surveillance (FAO, 2022).

Fisheries in the Indian Ocean account for roughly 14% of global marine capture harvest. The Indian Ocean represents the second-largest tuna production area in the world and accounts for “nearly 20% of the world commercial tuna catch”, or roughly one million tonnes annually (IOC, 2020). Notably, catches have been increasing since the 1980s. Of these stocks, 30% ‘are not fished within biologically sustainable levels.’

There is some debate about the extent to which most of the IUU fishing in the WIO is attributable to local versus foreign fishing fleets, and there is strong evidence for either side. Nevertheless, local fishers, who individually may not be responsible for large-scale overfishing, collectively account for a significant
amount across each EEZ. “Local” refers to fishers carrying the flag of the State whose EEZ their activity primarily resides. This includes local fishers of varying sizes – from the subsistence and small-scale fishers to large-scale commercial fishers. Estimates of unreported catch from Sea Around Us (SAU) allow us to gauge the extent of IUU fishing in the WIO (Pauly, Zeller, & Palomares, 2020). They confirm that in some countries, domestic fleets are responsible for most unreported catches (Table 2-1). For example, between 2016 and 2018, virtually 100% of the unreported catch in Comoros, Madagascar, Mozambique, and Tanzania was from the domestic fleet.\textsuperscript{11}

However, SAU data suggests that Thailand is responsible for more than half (59%) of unreported fishing in the WIO, primarily from activities in Somali waters. Anecdotal evidence suggests that this data may understate the level of activity of other foreign fishing fleets, especially from China and Taiwan.\textsuperscript{12}

Table 2-1: Share of unreported landed value by the top fishing nations in each EEZ, 2016-2018 average

<table>
<thead>
<tr>
<th>EEZ</th>
<th>Top Unreported Fishing Entities</th>
<th>% Total Unreported in EEZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comoros</td>
<td>Comoros</td>
<td>100%</td>
</tr>
<tr>
<td>Djibouti</td>
<td>Yemen</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>Somalia</td>
<td>13%</td>
</tr>
<tr>
<td>Eritrea</td>
<td>Eritrea</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Egypt</td>
<td>40%</td>
</tr>
<tr>
<td>Kenya</td>
<td>Kenya</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Tanzania</td>
<td>31%</td>
</tr>
<tr>
<td>Madagascar</td>
<td>Madagascar</td>
<td>100%</td>
</tr>
<tr>
<td>Mauritius</td>
<td>Mauritius</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>4%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Mozambique</td>
<td>99%</td>
</tr>
<tr>
<td>Seychelles</td>
<td>Seychelles</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>7%</td>
</tr>
<tr>
<td>Somalia</td>
<td>Thailand</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>South Korea</td>
<td>2%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Tanzania</td>
<td>100%</td>
</tr>
<tr>
<td>All WIO</td>
<td>Thailand</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td>Mozambique</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Madagascar</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: UNECA adaption of SAU (Pauly, Zeller, & Palomares, 2020)


\textsuperscript{12} Working Group for this Maritime Security Study, 21 February 2022.
In some instances, distant water fishing fleets are known to contribute to the region’s overfished stocks. Usually, these are Asian and European fleets. Some observers also note that Iran has conducted substantial unregulated fishing in the Indian Ocean, in Somali and Yemeni territorial waters. A research report jointly authored by Global Fishing Watch and Trygg Mat Tracking and supported by the Federal Government of Somalia indicated that nearly 200 Iranian vessels were operating in Yemeni and Somali waters. Automatic Identification System data reinforced this conclusion. One expert interviewed for this study indicated that the behavior of the Iranian fishing fleet is particularly difficult to track because they are often reluctant to share tracking data with international observers attempting to trace fish stocks and monitor fleets.

How significant thus is the problem of unreported catch in the region, and does it rise to a high enough cost to warrant intervention? Data shows that 60% of the value of all fish caught in the region was unreported in 2018 (Figure 2-1), which accounted for roughly USD11 billion (SAU 2020). In that year, three-quarters of all reported catch value in the entire region came from Mozambique while 95% of all unreported catch value was just in Somalia’s EEZ. Thailand was responsible for the bulk of unreported catch value in Somali waters (96%).

Figure 2-1: Reported vs unreported catch by State, 2018

SAU’s estimate of 60% in catch value being unreported in 2018, corresponds to about 230,000 metric tonnes of fish. This is almost a third of the total volume of catch landed across the region (Figure 2-2). As significant as this is, it represents a decline in both the volume and share of unreported catch since the turn of the 21st century. In part, this may be attributable to the increased efforts to fight

---

14 Ibid.
15 Ibid.
16 Interview, Fisheries Scientist with expertise in the Horn of Africa, 7 December 2021.
illegal fishing, by States and regional entities such as the Indian Ocean Commission (including the MASE Programme discussed in a later chapter), Interpol, the FISH-i Africa Task Force, and NGOs such as the Pew Charitable Trusts (Secure Fisheries, 2018).

**Figure 2-2: Volume of reported and unreported catch in the WIO (metric ton), 2011 – 2020**

Source: Adapted from SAU (Pauly, Zeller, & Palomares, 2020)

Note: Extrapolation for 2019 and 2020 estimated using a polynomial function of the 6th order.

A thorough investigation of IUU warrants a deeper understanding of the distinct types of fishing activities. This report utilises the following categorisation of fishing activities (adapted from FAO):

- **Subsistence fisheries**: Fisheries where fish are caught and consumed directly by families, rather than being bought and re-sold in local markets.
- **Artisanal fisheries**: Traditional fisheries use relatively small vessels, small amounts of capital and energy, making short trips close to shore to catch fish, primarily for local sale and consumption.
- **Industrial fisheries**: Large-scale commercial fisheries that tend to operate further from the coast, using ocean-going fishing vessels.
- **Recreational fisheries**: A non-commercial fishing activity exploiting marine living resources for recreation, tourism, or sport.

Not all fishing sectors are equal offenders in terms of unreported catch. Unsurprisingly, in States where there is a vibrant fishing culture and high dependence on fish for domestic consumption, most of the subsistence fishing goes unreported. Similarly, for the informal recreational fishing sector, it is estimated that all fishing goes unreported. In 2018, a third of the catch value in the region was in the artisanal sector, but it was estimated that most of it was reported (SAU, 2021). By contrast, the sector requiring the closest attention is industrial fisheries – where across the WIO, over 93% of the catch was not reported (Figure 2-3). This issue is most prevalent in Djibouti, Eritrea, Kenya, and Somalia.
Approximately 62% of the value of unreported catch across WIO is attributable to industrial fisheries (Figure 2-4). In some WIO countries where industrial fishing accounts for more than three-quarters of the country’s total catch value, such as both Djibouti and Somalia, this means that most of the overall fishing industry goes unreported, unmonitored, and untaxed. In addition to threatening the sustainability of fish stocks, the scale of unreported industrial fisheries endangers the long-term opportunities for small-scale fisheries. This can slow progress to achieving Target 14. b of the SDGs, which calls for protecting resources and market access for small-scale fisheries.
In 2018, SAU (Pauly, Zeller, & Palomares, 2020) analysed 414 fish stocks and found that most of the WIO catch came from either fully exploited stocks\(^\text{17}\) (72%) or developing ones (21.9%) a trend that has been relatively steady for the past 20 years. Not surprisingly, less than 1% of all WIO catch came from collapsed stocks during the same period, while catch from over-exploited stock saw a decrease since 2011, reaching a low of 5% of all WIO catches in 2018 (Figure 2-5). While one cannot conclude with certainty that IUU fishing has been primarily responsible for collapsing or overexploiting stocks, it brings other negative impacts such as loss of tax intake for the State, loss of livelihoods, and environmental damage from the use of illegal equipment.

**Figure 2-5:** Percentage of stock of fish by stock status in WIO, 2000 – 2018

Based on research by Agnew et al, (2009) on an assessment of IUU fishing against the national governance index, there are indications that the risk of IUU fishing is higher where there is less effective governance. There are clear differences among the WIO countries with regards to IUU fishing-conducive environments. Some countries, such as Mauritius and Seychelles, are at or above- average, in governance.\(^\text{18}\) This may contribute to the relatively low share of the unreported catch in the industrial sector (Table 2-2). However, other countries have relatively weaker governance and limited structure such as Madagascar and Comoros, with comparatively higher rates of unreported catch. This will result in a varied capacity of these islands to implement activities related to SDG 14\(^\text{19}\) (EU, MRAG, 2018).

---

\(^{17}\) SAU (Pauly, Zeller, & Palomares, 2020) use the five designations of fish stock development stages developed by (Froese & Kesner-Reyes, 2002): (1) undeveloped - Year before maximum catch and catch is less than 10% of maximum value; (2) developing - Year before maximum catch and catch 10-50% of maximum value; (3) fully exploited - catch larger than 50% of maximum value; (4) overfished - year after maximum catch and catch 10-50% of maximum value; (5) collapsed – year after maximum catch and catch less than 10% of maximum value.

\(^{18}\) As defined by the Worldwide Governance Indicators (WGI) for six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption. http://info.worldbank.org/governance/wgi/#reports

\(^{19}\) SDG14 is to Conserve and sustainably use the oceans, seas and marine resources for sustainable development (https://unstats.un.org/wiki/display/SDGeHandbook/Goal+14)
It is also helpful to observe how the WIO’s region’s vulnerability to, exposure to, and response to IUU fishing compares to the rest of the world. A network of experts in the Global Initiative Against Transnational Organised Crime collaborated with a fisheries consultancy to develop an IUU fishing index (Macfadyen & Hosch, The IUU Fishing Index, 2021). The index compares the degree to which States are exposed to, and effective at combating IUU fishing. On average the region ranked in the lower third for its overall level of vulnerability to IUU fishing. On one end of the spectrum of WIO States, the country with the most room for improvement towards effectively combatting IUU fishing is Somalia. She is ranked the most vulnerable in Africa and the 4th most vulnerable globally (behind China, Russia, and South Korea). The report noted Somalia's weaker areas such as insufficient clarity and management of their EEZ and ports to reduce the risk of IUU fishing; limited compliance to the port state obligations of regional fisheries management organisations (RFMOs) et cetera. On the other end of the WIO spectrum, Djibouti was the least exposed/vulnerable to IUU fishing, and amongst the 20 best-performing nations worldwide based on the assessment in 2021. The country reduced its relative risk of IUU fishing since the assessment in 2019, in part by improving port management of foreign vessels. Thus, a more updated view of Figure 2-3 (see page 41) may show a significantly lower share of unreported fishing in the industrial sector.

2.1.2 Socioeconomic Impacts

IUU fishing is often linked to overfished stocks, which have grave implications for the health of the marine ecosystem and for coastal food security, especially in light of the compounding pressures on fish stocks, such as warming ocean temperatures. This is critical for food security, sustainable economic growth, and efforts to minimise the impact of climate change on coastal communities. The presence or absence of fisheries regulation across the WIO also has a socio-economic impact in the region. In those countries where monitoring and enforcement of fishing laws are limited, some vessels, such as trawlers, can exacerbate the physical damage to the environment. This is more prevalent in reef areas.

IUU fishing can also be linked to some violence as weapons smugglers have been observed to be employing fishing dhows to clandestinely transport arms, including ballistic missiles and unmanned aerial vehicles. For example, dhows

22 Interview, Fisheries Scientist with expertise in the Horn of Africa, 7 December 2021.
have been observed delivering weapons to the Houthis in Yemen.\textsuperscript{23} There have been instances where conflicts arise between foreign fishing fleets and local fishers. Iran has been accused of firing on Yemeni fishing boats and fishermen, and it has been reported that large numbers of foreign fishing vessels also have restricted the movement of local fishing vessels.\textsuperscript{24} The conflict between fishers is particularly acute when they compete for the same kinds of fish. A fisheries scientist with expertise in the Horn of Africa area opines that, for instance, some countries with comparable boat sizes ‘are going after the same kinds of things as the small-scale fishers.’\textsuperscript{25}

IUU fishing has clear effects on the people in coastal communities who depend on fishing, either for their livelihoods or as a regular part of their diet. While some continental States, such as Somalia, do not rely on fish consumption (though the number of those who do is slowly increasing),\textsuperscript{26} dependence on fish protein is very high among island and coastal communities. Unaddressed, IUU fishing – and by extension overfishing – will further threaten food security in the region, and lead to ‘a shortage of fatty acids and essential micronutrients for millions of people in the region, with a disproportionate risk of malnutrition in low- and middle-income countries.’\textsuperscript{27}

\subsection*{2.2 Piracy and Armed Robbery Against Vessels}

\begin{center}
\textbf{Maritime Security Threat \#2:}

\textbf{PIRACY AND ARMED ROBBERY}

\begin{itemize}
\item \textbf{Estimated Annual Direct Economic Impact:} US $156 million
\item \textbf{Direct Costs:} Insurance premiums, privately contracted maritime security teams
\item \textbf{Socio-economic Impact:} Reduced purchasing power, lost opportunities in cruise industry
\item \textbf{Primary Victims:} Seafarers, local fishers
\end{itemize}
\end{center}

Article 101 of the United Nations Law of the Sea (UNCLOS) defines piracy as consisting of any of the following acts:

\begin{itemize}
\item Any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or passengers of a private ship or a private aircraft and directed:
\end{itemize}

\begin{itemize}
\item \textsuperscript{23} “Iran’s ‘massive illegal fishing operation’ in Indian Ocean exposed,” Al-Mashareq, 20 July 2020, https://almashareq.com/en_GB/articles/cnmi_am/features/2020/07/20/feature-01.
\item \textsuperscript{24} “Iran's ‘massive illegal fishing operation’ in Indian Ocean exposed,” Al-Mashareq, 20 July 2020, https://almashareq.com/en_GB/articles/cnmi_am/features/2020/07/20/feature-01.
\item \textsuperscript{25} Interview, Fisheries Scientist with expertise in the Horn of Africa, 7 December 2021.
\item \textsuperscript{26} Interview, Fisheries Scientist with expertise in the Horn of Africa, 7 December 2021.
\item \textsuperscript{27} “Unregulated Fishing on the High Seas of the Indian Ocean: The Impacts on, Risks to, and Challenges for Sustainable Fishing and Ocean Health,” WWF in cooperation with Trygg Mat Tracking, with data and analytical support from Global Fishing Watch, 2020, https://wwf.panda.org/wwf_news/?1014116/Unregulated-fishing-on-the-high-seas-of-the-Indian-Ocean (8).
\end{itemize}
(i) On the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft;
(ii) Against a ship, aircraft, persons, or property in a place outside the jurisdiction of any State;

Any act of voluntary participation in the operation of a ship or an aircraft with knowledge of facts makes it a pirate ship or aircraft.

Piracy, as defined by UNCLOS, posed a major threat to vessels transiting through WIO, particularly off the coast of Somalia where most pirate groups originated, from 2005 and through much of 2012. The origins of piracy are often explained as a response to unchecked IUU fishing in Somali waters by foreign fishing fleets, which resulted in diminished catches for Somali fishers. What began as a policing activity by coastal Somalis for IUU fishing activity in their waters, and occasionally impounding vessels deemed to be partaking in illegal fishing activity, eventually spread to targeting vessels of all types, where pirate groups held crews and vessels hostage in order to extract a ransom payment from the shipping company or the families of hostages. However, this explanation of the origins of piracy is disputed as other experts purport that most pirates exclusively operate from a place of opportunism and greed.28

2.2.1 Current Context

In 2019, 12 incidents of piracy were recorded in East Africa, out of which five were robberies, four were failed attacks, two were armed robberies, and one was a successful vessel hijacking.29 The region also recorded several so-called “suspicious approaches” in 2019 (as reported by ship masters to reporting

---

28 Interview with maritime security expert, 8 December 2021
centres). However, those reported in the Bab-el-Mandeb Strait and the Gulf of Aden are often not linked to piracy; rather, they are more closely associated with the conflict in Yemen, fishing vessels and trolling skiffs operating in the region, and smuggling activity.\textsuperscript{30,31}

Piracy in the WIO region no longer poses the threat that it once did. In 2019, the size of the ‘High-Risk Area’\textsuperscript{32} in the WIO was shrunk in response to the low level of activity.\textsuperscript{33} Many experts, including those interviewed for this study, attribute the precipitous decline in piracy from 2012 onwards to a combination of factors, including the rise in use of privately contracted armed security personnel (PCASP) on board vessels transiting the region, international naval patrols throughout the region, and a regional judicial system bolstered by international capacity building efforts which provided support to Kenya, Seychelles, and Somalia in training lawyers and judges to hear trials of suspected pirates, as well as assistance in building prisons to house those convicted of piracy.

It is critical to note that while piracy activity has decreased substantially, the network of former pirates has not disappeared. It is most likely that given the combination of deterrents being deployed in full force, the risk/reward ratio is not particularly favourable to piracy. In response to this, pirates have paused their actions and sought other profit-making ventures, both licit and illicit.\textsuperscript{34}

Piracy off the coast of Somalia generated powerful criminal networks. The international crackdown on piracy turned pirates into ‘poly-criminals’ who have since diverted their criminal activities into new transnational organised maritime crimes and threats.\textsuperscript{35}

The situation in Somalia, which originally enabled piracy to thrive (for example, due to lack of viable, licit economic opportunities, ungoverned spaces, access to vessels transiting close to shore, and basic seafaring knowledge) remains unchanged. The International Maritime Bureau’s 2019 Annual Piracy Report ‘cautions ship owners and masters against complacency. Somali pirates still retain the capability and capacity to carry out incidents.’\textsuperscript{36} Therefore, a resurgence of piracy activity is possible, and vessels transiting the region should remain vigilant.

\textsuperscript{31} Reaffirming this, the annual report on global maritime security from the Maritime Information Cooperation and Awareness Center (MICA Center) of the French Navy included Yemen in the list of the 10 areas most affected by maritime approaches in 2021, noting 10 incidents in 2021.
\textsuperscript{32} The High Risk Area was first developed at the height of the Somali piracy crisis, in 2010, to make clear to vessels transiting the western Indian Ocean where pirates were known to be operational and where crews should exercise additional vigilance.
\textsuperscript{34} Some former pirate financiers and kingpins are known to have invested some of their profits in real estate, hotels, and restaurants. Others are suspected to have jumped to other illicit activities, such as drugs and weapons smuggling across the Horn of Africa.
2.2.2 Socioeconomic Impacts

The impact that piracy and robbery against vessels have on seafarers onboard vessels transiting the most high-risk areas, as well as on the international community is indisputable. In 2010, pirates hijacked 44 vessels in the WIO region and took over 600 seafarers hostage.\(^{37}\) Dozens of seafarers were killed in piracy incidents, either during initial attacks by the pirates after a successful hijacking, as a result of lack of access to food or essential medicines, or as the unfortunate result of being caught in the crossfire between pirates and international naval forces during rescue attempts.

Several victims of piracy were held for ransom for long periods. Crews were sometimes held for months or even years at a time. For example, the crew from the FV \textit{Siraj} were held for more than five years. The \textit{Siraj} was captured by pirates in March 2015 and the last of the remaining crew were released in August 2020.\(^{38}\) Tragically, many languished during their captivity and in the absence of adequate medical care, died in captivity.

At its peak, pirates in the WIO region were known to have received on average USD four to five million in ransom from hijacked vessels.\(^{39}\) The largest ransom ever paid was USD 13.5 million for the Very Large Crude Carrier (VLCC) \textit{Irene SL}.\(^{40}\) Pirates also posed a significant threat to the cruise industry, whose ships called in places like Port Victoria, Seychelles, and Mombasa, Kenya, resulting in a precipitous decline in the industry in the region, thereby costing regional economies millions of dollars of lost opportunities.\(^{41}\) At its peak, the combined expenses of ransoms paid to pirates to release hijacked vessels and for individual ship protection measures - including hiring privately contracted armed security personnel on board vessels transiting high-risk areas, and insurance - cost the international community as much as USD seven to 12 billion, annually. This is without factoring in the secondary costs on coastal communities, such as loss of jobs and other opportunities resulting from reduced number of tourists.

Piracy posed enough of a threat to warrant several UN Security Council Resolutions, a handful of regional agreements, and international naval forces coalescing in the region to perform patrols of the waters and to protect World Food Programme vessels. In 2010, the “High-Risk Area” demarcation in WIO was established\(^{42}\) in response to pirates stalking vessels ever further out to sea. At one point, the area of operations for Somali pirates extended nearly to the Indian coastline.

---

\(^{37}\) Anna Bowden, \textit{The Economic Cost of Piracy} 2010, One Earth Future Foundation.


\(^{39}\) Anna Bowden, \textit{The Economic Cost of Piracy} 2011, One Earth Future Foundation.


2.2.3 Economic Costs

For many years, Somali piracy costs the international community millions of dollars annually. The shipping community paid for insurance to cover vessels transiting High-Risk Areas, hired privately contracted armed security personnel on board vessels, and invested in ship protection measures – such as razor wire and sandbags around the vessels. Countries from all over the world deployed assets and personnel to assist the region in patrolling the waters off the coast of Somalia. Inter-governmental organisations such as the United Nations provided support in the form of capacity building to bolster regional judicial systems so that apprehended pirates could be held, tried, and imprisoned in the region. These initiatives appear to have been successful because the last vessel known to have been captured by Somali pirates is the *Aris-13* in 2017.

Despite the decline in incidents of piracy, vessels transiting the waters off the coast of Somalia are advised to remain vigilant and to continue to employ Best Management Practices to deter incidents of piracy. The following section attempts to estimate the cost of such protection measures to the international shipping community. This report employs conservative estimates of all the relevant cost categories and drew estimates only in areas in which reliable data was available.

This report estimates the total cost of piracy in the WIO in 2019 to be USD 156 million, based on the cost of several anti-piracy measures employed by vessels transiting the region (refer to Table 2-2 for a detailed breakdown). Other studies, in recent years, have developed estimates ranging from USD 1.7 billion to USD 1.4 billion per annum, The difference can be explained on several levels.

---


44 In the past, other groups have included additional costs to the shipping community, such as the cost of re-routing around and speeding through the high-risk area, or the cost of installing citadels in vessels. However, the authors did not include any of these in their estimates. There was not significant evidence of vessels continuing the practices of re-routing or speeding in 2019, based on interviews with experts. In 2017, the last years Oceans Beyond Piracy drafted its State of Maritime Piracy study, the group wrote regarding speeding, “OBP did not find any statistically significant rerouting in 2017.” As such, this report does not attempt to quantify. As for the cost of citadels, experts interviewed indicated that there is tremendous variability in cost across vessels; for instance, it is relatively inexpensive to include one when a new vessel is being built, but to retroactively add the same citadel structure to an older vessel will cost considerably more. Due to this, and the variability as to what a citadel might entail (everything from a room with a lock, to closed circuit television systems, to ballistic protection, to food and water for mustering crew), the authors felt this would not be an accurate estimate and opted against including it in the study.

45 A detailed description of the specific expenditures included in the cost estimate, as well as methodology will be discussed later in this section.


48 One critical piece of information needed to calculate these figures is the number of vessels operating in the region. We estimate the number of vessels transiting the region in 2019 to be 11,932. For its analysis of costs related to piracy and armed robbery in 2015, Ocean Beyond Piracy employed AIS data to come up with an estimate of vessels in the Western Indian Ocean region between 10,300 and 11,350. Using the average of those two numbers, 10,825, as the baseline, the authors multiplied that number by the annual seaborne trade volume expansion rate percentages estimated in the United Nations Conference on Trade and Development’s annual Review of Maritime Transport studies for 2016, 2017, 2018, and 2019, in which the rates were 2.6%, 4%, 2.8%, and 0.5%, respectively.
First, this report does not include the same list of expenses to the shipping industry as used by previous reports. For example, this study did not estimate the cost of vessel re-routing around or speeding through the High-Risk areas. Moreover, the most recent assessment of the economic cost of piracy in the region was conducted in 2017. As is evident from the comparison between the costs of piracy and armed robbery to the industry in 2017 and 2019 in Table 2-1, the overall spending to counter piracy and armed robbery has declined substantially during that time. One maritime security expert consulted for this project suggests that this is largely because of the decrease in associated risk to vessels transiting the waters of the WIO. While incidents of attacks against vessels are still reported, the International Maritime Bureau has only recorded one event between 2019 and 2021. As a result, the perceived risk is lower, as is the adherence to anti-piracy ship protection measures.

Finally, the cost of the piracy deterrents themselves has declined. For instance, as piracy first emerged as a threat in this region over a decade ago, many vessels which frequently transited the area had already invested in ship protection measures such as sandbags and razor wire, which made boarding vessels more difficult. Therefore, this report’s costing for such measures is examining only the replacement rate, under the assumption that the vessels would have already made the initial investment and now only spend on maintenance and replacement. Moreover, the cost of private security is presumed to have gone down. When private security teams first emerged onboard vessels in order to protect the vessels against piracy attacks, the teams were composed primarily of highly trained former military and police from the United Kingdom. As the use of private security teams grew more pervasive, the compositions of the team largely shifted:

While the number of non-UK multinational teams decreased, the number of Greek, Indian, and other single nationality teams grew in 2016 -potentially a cost-saving measure as UK personnel are grouped with less costly counterparts or bypassed completely.

Similarly, over time, team size was reduced. The average team size now is three. Finally, the rates at which vessels hire private security teams are assumed to have gone down. Between 2015 and 2017, a 13 percent drop in the usage of private security teams was observed, from 38% of vessels to 25.1% respectively. This report assumed a similar percent drop in usage between 2017 and 2019. Coincidentally, the cost of hiring private security teams reduced drastically over time.

---

52 Ibid.
### Table 2-2: Total Cost of Somali Piracy to Industry, 2019

<table>
<thead>
<tr>
<th>Category</th>
<th>2019 Cost (USD)</th>
<th>2017 Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance</td>
<td>62.3 million</td>
<td>50.6 million</td>
</tr>
<tr>
<td>Ransoms</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hazard Pay</td>
<td>18.5 million</td>
<td>78.1 million</td>
</tr>
<tr>
<td>Ship Protection Measures</td>
<td>4.1 million</td>
<td>6.8 million</td>
</tr>
<tr>
<td>Private Security</td>
<td>70.8 million</td>
<td>292.5 million</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>156 million</strong></td>
<td><strong>$428 million</strong></td>
</tr>
</tbody>
</table>

*Source: Authors’ estimations*

### Insurance

Ship owners and operators opt for insurance to protect the crews, cargoes, and the vessels themselves during transit. Various kinds of insurance are required and are available, depending on the kind of operation being undertaken. ‘[T]he three most common types of marine insurance are hull, cargo, and Protection and Indemnity (P&I)’ which cover the physical loss of, or damage to a vessel, loss or damage to goods being transported, and the liability of a vessel owner, respectively. Furthermore, some ship owners and operators will opt to purchase an “Additional Premium” on top of the “Annual Premium” paid to an insurance company which is ‘calculated as a percentage of a ship's insured value for regular worldwide trading.’ The Additional Premium ‘...becomes payable when a ship intends to enter an excluded area presenting a perceived enhanced risk. These premiums are also charged as a percentage of the ship's insured value, and usually cover a seven-day period.’ The areas determined to be of enhanced risk are determined by protection & indemnity (commonly known as P&I) clubs.

### War Risk Insurance

War risk insurance is ‘insurance against loss or damage due to the acts of war.’ The estimates of War Risk Insurance in this report are informed by numbers from the Hellenic War Risk Club, a war risks insurer which covers over 80% of all Greek-owned ships. Assuming the percentage of HWR members passing through the WIO War Risk Area was 50% of total HWR membership, as has been the trend in past years, and that HWR represented 10.82% of global market share, then the total for War Risk Insurance in 2019 would be at USD 60,175,600.

### Kidnap and Ransom Insurance

Kidnap and Ransom Insurance can be purchased to provide an additional layer of protection for the ship’s crew. In 2017, in the last economic study of the cost

---

of piracy conducted by Oceans Beyond Piracy, the group estimated that 12% of vessels transiting the WIO region purchased K&R insurance in 2019. Assuming that the average cost of coverage is USD1,500 per transit, the authors estimate the cost of K&R insurance to be USD 2,147,760.\textsuperscript{59}

**Cost of Labour**

Seafarers suffer tremendous abuses during incidents of piracy and armed robbery. Over the course of a piracy incident, crewmembers may be shot at, beaten, held hostage, have food and/or medical attention withheld, be tortured, and have their families terrorised by their ordeal. On top of the trauma that an incident of piracy may produce, piracy incidents may also result in seafarers and their families--who disproportionately hail from developing countries--incurring significant financial burden as there is a loss of livelihood.

This section accounts for two labour costs: (i) the cost of hazard pay owed to seafarers by their employers when transiting the High-Risk Area in the Indian Ocean and (ii) the cost of captivity pay. In total, the cost of additional labour costs attributed to piracy and armed robbery in 2019 is estimated at USD 18,466,525.\textsuperscript{60}

**Hazard Pay:** As defined by the International Bargaining Forum (IBF)\textsuperscript{61} Warlike and High-Risk Area list of designated areas, *Hazard Pay* is a bonus wage awarded to seafarers for the duration of the transit through the designated High-Risk Area (HRA), which is equal to their base wage. In other words, seafarers transiting the HRA are entitled to double their normal wage. In 2014, there were 20,000 transits in HRA, each of which took approximately 2.6 days. From 2017 and 2019, it is assumed that there has been a reduction of approximately 30% of transits in HRAs, resulting in approximately 6,000 transits in 2019, each taking around one day. Assuming a daily crew wage of USD 3036.75,\textsuperscript{62} the hazard pay owed to crews in 2019, is estimated at USD 18,220,500.

**Captivity Pay:** Captivity pay, as determined by the IBF, is equal to a seafarer's base wage plus 35%, paid to captive seafarers or their families. This report

\textsuperscript{59} This number was determined based on the 11,932 estimated number of transits in the region. 11,932*.12*1500=$2,147,760.

\textsuperscript{60} Labour costs includes the cost of hazard pay plus the cost of captivity pay, which will be discussed in detail in the following subsections.

\textsuperscript{61} The International Bargaining Forum (IBF) is the mechanism by which maritime employers and seafarers unions negotiate over wages and conditions of seafarers. This includes guidelines for the rights and responsibilities for employers and seafarers in three categories of areas that may pose a risk of piracy and kidnapping: (1) Warlike Operations Areas (WOA), High Risk Areas (HRA) and Extended Risk Zones (ERZ)

assumes a base wage of USD134 per day. In 2019, four crewmembers from the FV Siraj remained in pirate captivity. One was released on 22 September 2019 due to severe medical needs. Three of the four seafarers were held 365 days in 2019. They were owed USD198,068. The final seafarer was owed USD 47,939. In total, the crew of the FV Siraj was owed USD 246,025 for their time in captivity in 2019.

**Ship Protection Measures**

The estimate of ship protection measures includes the cost of razor wire, sandbags, and warning signs to protect the perimeter of the vessel. These ship protection measures were initially outlined in the first version of Best Management Practices to Deter Piracy in the Gulf of Aden and off the coast of Somalia, which was originally released in 2009. This report assumes that the vessels transiting the region have already initially outfitted their vessels.

However, conditions at sea deteriorate physical barriers over time. Therefore, the estimate for ship protection measures in this report is informed by the rate of refitting. Fifteen percent of vessels transiting the region are estimated to refit their ship protection measures annually. Based on this, the cost of ship protection measures is estimated to have been a total of USD 4,142,745 in 2019.

**Privately Contracted Armed Security Personnel**

One of the later additions to the fight against piracy off the coast of Somalia— but one that is generally agreed to have contributed to its decline—is the use of Privately Contracted Armed Security Personnel (PCASP) on board vessels transiting the high-risk area. Initially, PCASP teams composed of eight personnel were recommended. As the perception of the risk of piracy incidents declined, so did the PCASP team size.

The trend toward three-man teams which was noticeable in 2013, 2014, and 2015 continued in 2016. From the start of the year to the end of the year, the number of ships employing three-man teams increased steadily - while the use of four-man teams steadily declined.

Based on the assumption that three-man teams continued to be the norm, and that roughly 12% of vessels transiting the region employed PCASP teams for an average of seven days at a time, at a daily rate of USD 1,350, this report estimates the total cost of PCASP teams in the region to be USD 70.8 million in 2019.

Several maritime security experts who consulted for this report estimated the cost of teams between USD 5,000 and USD 10,000 and assumed that the average is likely

---


64 Maisie Pigeon et al., The State of Maritime Piracy 2017, Ocean Beyond Piracy.

Illicit trades of all sorts of commodities largely rely on the same routes and modes of transportation as those used by legal commodities. By dint of the large share of shipping traffic which populates the Indian Ocean, and the region’s geographic position between Africa, Asia, and Europe, WIO is home to a pervasive illicit trafficking network that services a wide variety of illicit products, or legal products traded illegally.

66 Interview, Maritime Industry Expert, 13 January 2022.
67 Interview, Maritime Security Analyst, 14 January 2022.
68 Interview, Maritime Industry Expert, 13 January 2022.
Since the onset of the COVID-19 pandemic, the virus has had and continues to have far-reaching implications for economies around the world. The global shipping industry was particularly hard-hit as production slowed and seaports closed around the world. However, an easing of COVID-19 restrictions may have contributed to the recent rise in smuggling incidents in the Indian Ocean which saw everything from old Soviet arms to African psychotropic plants illegally crossing its waters.69

As recently as in November 2021, the Iranian Navy seized a vessel in the Gulf waters which was found to be carrying over 150,000 liters of ‘contraband diesel’.70

There have been several international programmes aimed at shutting down the illicit trafficking of various commodities. These include the Global Maritime Crime Programme of the United Nations Office on Drugs and Crime (UNODC) as well as its Container Control Programme. They have joined forces with the European Union to train port personnel, as well as customs and law enforcement administrations, to stem the flow of illicit trades.71

Over the coming years, UNODC will be implementing the EU Port Security and Safety of Navigation Programme in...Angola, Comoros, Kenya, Mozambique, Madagascar, Mauritius, Namibia, Seychelles, and Tanzania. The project will be rolled out in close collaboration with the International Maritime Organisation (IMO), INTERPOL and the World Customs Organisation (WCO) - under the coordination of the Indian Ocean Commission.72 Similarly, the United Nations Development Programme (UNDP) and the Global Environment Facility are cooperating in a joint initiative called Reducing Maritime Trafficking of Wildlife between Africa and Asia which aims to strengthen law enforcement at ports in order ‘to detect trafficking activity and increase cooperation between ports and other stakeholders.’73

This report is unable to quantify the cost of illicit trades across the region because of the lack of publicly available information on seizures of illicit shipments, as well as court and incarceration statistics. Where some strong data on these figures exist, availability varies considerably from country to country, and from commodity to commodity. From interviews with experts, the authors of this study gathered that only a small number of individuals in a single country have access to information regarding the seizure of illicit consignments being smuggled. It also was not apparent

Vessel at container terminal in port of Mombasa on June 17, 2022 in Mombasa, Kenya.
Credit: Shutterstock/Druid007
as to which agencies have such data. Greater availability of such data would contribute to the development of a more robust regional response to these kinds of crimes.

Table 2-3: Total Trafficking Incidents in WIO region, 2019 - 2021

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>106</td>
<td>102</td>
<td>184</td>
</tr>
<tr>
<td>Fuel</td>
<td>26</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Weapons</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Wildlife and other contraband</td>
<td>33</td>
<td>55</td>
<td>83</td>
</tr>
<tr>
<td>TOTAL</td>
<td>166</td>
<td>173</td>
<td>278</td>
</tr>
</tbody>
</table>

Source: RMIFC.

Note: the RMIFC’s area of interest spans the east coast of Africa, from the Red Sea in the north to South Africa, and west to the coast of India.

It is essential to understand the different areas of illicit trade to better anticipate the impact of any growth in these activities on the economies of the region. The subsections below will look at the illicit trade in drugs, arms, and illegal wildlife products in more detail.

### 2.3.1 Drugs

Africa’s eastern seaboard and island States are crucial parts of the international drugs trade as transit or trans-shipment points. The so-called “Southern Route” colloquially known as the “Smack Track” is a route by which illicit opiates are trafficked out of Afghanistan into Pakistan. From Pakistan, the drugs are picked up at the coast, often by fishing boats and small dhows. They are then trans-shipped to larger merchant vessels in the Indian Ocean. Illicit shipments travel south along Africa’s east coast, before being landed in southern East Africa, oftentimes in Mozambique or Tanzania, where port inspection processes may at times be perceived as relatively relaxed. ‘Mozambique has an extensive coastline with hundreds of miles of isolated and unpatrolled beaches and coastline where drugs are off-loaded frequently.’ This has, in turn, resulted in a gradual increase in the usage of drugs domestically, and Africa on the whole ‘...is now experiencing the sharpest increase in heroin use worldwide...’

The RMIFC reports that “all agencies agree that 2021 will be an exceptional year” for trafficking of drugs by maritime routes, and that “…the reopening of borders has led to a significant increase in ‘drug trafficking on traditional vessels.”

---


2021 quarterly report for October-December also indicates a significant flow of drugs from the Iran-Pakistan area to Mozambique where the province of Cabo Delgado is prey to a jihadist insurgency, as well as traces of a secondary axis between Madagascar and Mauritius.\(^{77}\)

### 2.3.1.1 Current Context

Unfortunately, there is no shortage of media headlines naming various countries in the region as drug trafficking hubs. According to the United States Department of State INCSR Report on Drug and Chemical Control, Kenya is a transit country for several types of illicit drugs, including heroin and cocaine. Although most of the drugs entering the country are destined for markets in Europe and elsewhere, drug consumption has been growing within the country as well.\(^{76}\) Mozambique ‘is increasingly used as a base of operations by transnational organised crime networks from West and East Africa, and for South Asia as a transit point for illicit drug trafficking’.\(^{79}\) Drugs trafficked include heroin, cocaine, precursor chemicals, pharmaceuticals, and methamphetamine. Tanzania was also named by the US Department of State as a “significant” transit country.\(^{80}\)

Data compiled by the RMIFC quarterly and annual reports show that in 2021, drug seizures were up from 2019 and 2020. However, it is important to note that a rise in drug seizures may be attributable to either increased drug trafficking, improved regional capacity to conduct search and seizure operations, or simply good luck on the part of regional authorities, or some combination of all three.

#### Table 2-4: Number of Cases of Drug Seizures in the Indian Ocean Region

<table>
<thead>
<tr>
<th></th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>184</td>
<td>102</td>
<td>106</td>
</tr>
</tbody>
</table>

*Source: RMIFC*

Illicit drugs predominantly travel into the region via maritime routes and use transshipment at sea from larger vessels to smaller, coastal craft,\(^{81}\) which are capable of landing at informal ports along unmonitored beaches up and down the coast.

---


\(^{81}\) Lucia Bird et al., *Changing Tides: The evolving illicit drug trade in the western Indian Ocean*, Global Initiative Against Transnational Organized Crime, June 2021 (9).
[H]eroin is trafficked to transshipment points on the East African seaboard, including Kenya, Tanzania, and Mozambique, before being later transported to Madagascar, Mauritius, and Seychelles. Several sources report that shipments are also transported directly from the Makran coast to Malagasy waters, to be transferred onto smaller vessels before landing. The Regional Maritime Information Fusion Centre, based in Madagascar, argues that Madagascar is too far for dhows to reach from the Makran coast. They posit that trans-shipment to smaller boats occurs further north, in the waters near the Seychelles. Some sources estimate that at minimum, 40 tonnes of heroin transit the WIO region to enter East Africa, every year.

Over time, the landing points for drug shipments have moved further south: Disembarkation points for vessels carrying heroin have ...shifted southwards along the East African coast over a number of years: from Kenya through to Tanzania and ports in Northern Mozambique. Growing law enforcement focus on disrupting flows has played a role in displacing landing points south. Increasing seizures of heroin off the Mozambique coast and disruptions due to the conflict in Mozambique’s Cabo Delgado province may now be contributing to Madagascar’s increasingly prominent role as a repackaging and redistribution hub.

Once on African soil, the drugs are then dissimulated and shipped by air routes to destination markets which are often in Europe or North America.

The use of dhows for transporting illicit commodities of all kinds is well-documented. The popularity of dhows in illicit flows is partly due to the ubiquity of these vessels in the Indian Ocean, and their ability to travel to ports not suitable for larger vessels. Dhows are also relatively durable over long distances. Some vessels involved in heroin trafficking were adapted to further enhance their long-distance capabilities, including by adding extra-large fuel tanks. Yet their popularity may be waning. While many interviewees in law enforcement still highlighted dhows as the major vessel for trafficking, interviewees also cited purse seiners (a larger type of fishing vessel), while others argued that trafficking modalities as a whole were shifting away from the use of dhows towards bulk carriers, steel-hulled vessels and containers, as authorities are now highly aware of dhows’ historical connection to trafficking.

The sheer number of dhows in WIO waters makes interdiction of those carrying illicit shipments - of drugs or other commodities - extremely challenging, particularly for those countries whose Maritime Law enforcement capacity is already limited.

While the volume of drugs trafficked through the WIO has increased since 2015, the kinds of drugs observed have diversified: ‘Long-standing heroin flows have been joined by a flood of synthetic cannabinoids...’ According to a recent 2021 report by

---

82 Ibid.
84 Lucia Bird et al., Changing Tides: The evolving illicit drug trade in the western Indian Ocean, Global Initiative Against Transnational Organized Crime, June 2021 (14).
85 Lucia Bird et al., Changing Tides: The evolving illicit drug trade in the western Indian Ocean, Global Initiative Against Transnational Organized Crime, June 2021 (13).
86 Lucia Bird et al., Changing Tides: The evolving illicit drug trade in the western Indian Ocean, Global Initiative Against Transnational Organized Crime, June 2021 (1).
the Information Fusion Centre for the Indian Ocean Region, the Indian Navy reported an increase in overall smuggling incidents from earlier in the year. Among the products smuggled were ‘...arms and drugs, most commonly methamphetamines, but also heroin, cannabis, and khat, a type of plant-based stimulant native to the Horn of Africa....’

However, drug trafficking is not limited only to traditional drugs such as cannabis, cocaine, or amphetamines. It also extends to synthetic drugs, banned, or controlled pharmaceutical products often containing opioids, depressants, and fake or sub-standard medication. While banned and/or controlled pharmaceuticals are popular in the more developed countries of the WIO such as Mauritius and Kenya, fake and substandard medication find a market in poorer countries where HIV and malaria are largely prevalent. A larger demography suffering from a disease creates the mass need for medication. In the case of malaria and HIV which require long-term treatment, there is a market for fake medication as more people with no or limited means require long-term medication. Between 2015 to 2019, UNODC recorded the seizure of 66,030 kilograms of non-traditional drugs in the WIO, by both air and sea.

<table>
<thead>
<tr>
<th>Non-Traditional Drugs Type</th>
<th>Kgs seized between 2015-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>405</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>0.5</td>
</tr>
<tr>
<td>Opioids</td>
<td>34,276</td>
</tr>
<tr>
<td>Precursor</td>
<td>87</td>
</tr>
<tr>
<td>Sedatives and Tranquillisers</td>
<td>47</td>
</tr>
<tr>
<td>Substances not under International Control</td>
<td>31,214</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>66,030</strong></td>
</tr>
</tbody>
</table>

Source: UNODC

### 2.3.1.2 Socioeconomic Impacts

Illicit drug flows influence the consumption habits of populations in both destination countries, as well as trans-shipment points.

---


88 Transnational Alliance to Combat Illicit Trade (TRACIT)/ UNCTAD Report, MAPPING THE IMPACT OF ILLICIT TRADE ON THE SUSTAINABLE DEVELOPMENT GOALS, Pharmaceuticals, 2019
The ongoing prominence of the ‘southern route’, where heroin cultivated in Afghanistan is trafficked via East and Southern Africa to end markets in Europe and the United States, has meant that increasing volumes of heroin are being trafficked through the WIO. This has shaped a secondary flow of heroin to Mauritius and the Seychelles which has had a dramatic impact on these small island nations. Mauritius and Seychelles are home to deeply entrenched heroin markets. Seychelles is estimated to have the highest per capita rate of heroin consumption in the world.89

In Kenya, “[a]ccording to a survey conducted by the National Authority for the Campaign Against Alcohol and Drug Abuse in 2017, 18.2% (4,913,254) of Kenyans aged 15-65 years are currently using at least one drug or substance of abuse” of which 4.1% and 1% are using khat and cannabis, respectively.90 Estimates furthermore indicate that almost 55,000 Kenyans and over 32,000 Tanzanians inject heroin.91 Of all of the methods of consumption, the injection has the greatest potential for health risks as...the rates of HIV among people who inject drugs are several times higher than those among the rest of the population, and there are astronomically high rates of Hepatitis C in this group.92

Relatedly, while it is not believed to be widespread, experts have documented the practice of ‘flash blood’ across the region, which ‘...involves a person injecting the blood of another intoxicated user into his or her own veins, in order to ‘share’ the drugs’93 – an ineffective way to get high but an excellent method of contracting various infectious diseases.

As recently as 2018, experts estimated that roughly 40 tonnes of heroin transit the WIO region every year. About five tonnes of this stay within the region to supply local demand.94 That same year, one gram of heroin cost roughly USD 20 USD in Kenya, while costing USD 60 USD in the United Kingdom and USD 213 in Denmark.95 However, looking ahead, as the middle class continues to grow in Africa, the recreational drug market is likely to grow along with it, driving up the cost of illegal drugs on the market, and thereby potentially encouraging syndicates and smugglers to keep larger percentages of shipments in Africa. Overall, Sub-Saharan Africa is projected to sustain an increase of 5% in illicit drug use between 2018 and 2050.96

Given the region’s projected population growth over the same period, the continent is expected to experience ‘the largest increase in absolute numbers of illicit drug

89 Lucia Bird et al., Changing Tides: The evolving illicit drug trade in the western Indian Ocean, Global Initiative Against Transnational Organized Crime, June 2021 (1).
92 Ibid.
users...of any region in the world. This is likely to have serious implications for healthcare systems.

Beyond the obvious public health impact of drug culture becoming entrenched in coastal and island states, other ill effects that have been observed are: violence linked to the drug trade, decreased public trust in government and institutions, and economic effects. While no numbers are available for the WIO to allow this report to project the indirect costs of drug abuse, this report refers to the experience of the United States. The US federal government estimated the cost of drug abuse in the United States in 2007 at USD193 billion. The 2007 computation also accounts for USD 120 billion as lost productivity, "mainly due to labour participation costs, participation in drug abuse treatment, incarceration, and premature death". The total figure also includes USD 11 billion in healthcare costs, and USD 61 billion in criminal justice costs. In Kenya, 'money derived from heroin and cocaine has been used to fund multiple election campaigns, and drug traffickers themselves have campaigned for political power funded by drug money.' ‘Drug markets penetrate the society of each of the island states under study, driving cultural change and entrenching inequality.’ Finally, organised crime - including the drug trade - has a multitude of effects on local economies. ‘Money laundered into businesses distorts the market for other entrepreneurs who find it hard to compete with businesses that have slush funds and do not need to turn a profit.’

2.3.2 Arms and weapons

The flow of illicitly trafficked arms to an array of regional actors continues uninterrupted by dint of the several pockets of violent conflict across the region. Most notably, conflicts in Yemen and Somalia, as well as more recently, in Mozambique, Ethiopia, and Sudan. These drive demand for weapons across the Horn of Africa and East Africa. The WIO region possesses one of the most prolific weapons trafficking routes in the world; as shipments travel in both directions between Somalia and Yemen. 'Long-established commercial trade routes linking the Persian Gulf with the Indian Ocean and the Gulf of Aden has facilitated the movement of illicit weapon shipments.'

2.3.2.1 Current Context

In Yemen, a civil war that has spanned six years and resulted in the deaths of tens of thousands of people sees the Houthis revolting against the Yemeni Government. The possibility that the Houthis in Yemen are backed by Iran and that Iran was potentially supplying them with weapons has been reported. Iran has repeatedly denied involvement with the trafficking of arms to its Houthi allies at any point during the civil war. Several experts have suggested that human traffickers have added arms smuggling to their list of activities, from the Horn of Africa and East Africa to Yemen.

Smuggling routes include various sea routes, including some via the Red Sea and Yemeni islands to the west, and some others via the Arabian Sea and southern coast in Hadramut and al-Mahrah, and these are exploited for incidents such as the one reported about 'a shipment of AK-47 rifles and over 1,000 rounds of ammunition [that] was found in an otherwise innocent looking fishing vessel.'

Despite the difficulties in tracking and detecting weapons, since September 2015, international naval forces have carried out 13 maritime seizures of weapons shipments believed to have been destined for Houthis in Yemen.
Case Study 1: Ahlu Sunna Wal Jama, Northern Mozambique

Ahlu Sunna Wal Jama, or ASWJ, is an insurgent group in the Cabo Delgado region of Northern Mozambique. Starting in 2017, the group launched several violent attacks in the country, eventually capturing the coastal port city of Mocimboa da Praia and holding it for nearly a year.

The group’s presence in the region has resulted in violence, and nearly 700,000 persons were internally displaced as of March 2021. This also caused French oil giant, Total, to cease operations in the north of the country. A 2022 report by the Global Initiative for Transnational Organised Crime indicated that in response to the violence, trafficking routes along the Mozambican coast have migrated south to circumvent the insurgent group’s activities.

ASWJ appears to receive most of its financial support and weapons locally. The aforementioned GI-TOC report assumes that ‘in the early days of the conflict, insurgents may well have tapped into pre-existing sources and illicit flows of weapons in the region’ as well as from government sources. Over time, ASWJ’s weapons cache has grown considerably. “The bulk of this weaponry comes directly from Mozambican military sources, including weapons captured from security force camps, border posts and police armouries in towns and villages overrun by the insurgents and abandoned by Mozambican security forces in retreat.”

A theory exists in which smuggled weapons “have been moved south via seagoing dhows from Tanzania to insurgent-held territory along the Mozambican coast” as in the past, basic supplies were transported from southern Tanzania by boat to evade helicopter fire from security contractors patrolling the area. However, to this point, this theory has not been confirmed.

2.3.2.2 Socioeconomic Impacts

The proliferation of weapons linked to both the conflicts across the region has severe security implications, not only for neighboring countries but for the entire region. Small Arms and Light Weapons (SALW) are documented as the “primary tools of violence” in Sub-Saharan Africa and are known to escalate violence during periods of instability. This creates a vicious cycle, in which instability simultaneously inhibits economic growth.

---


112 Ibid.

113 Ibid.

114 Ibid.


116 Ibid.
Firearms are pervasive across the African continent and reportedly, ‘Civilians, including rebel groups and militias, hold more than 40 million small arms and light weapons, while government-related entities hold fewer than 11 million ....’

2.3.3 Wildlife

2.3.3.1 Current Context

Given the proximity to Asia, port cities on the East African coast, notably Mombasa, Kenya, and Dar es Salaam, Tanzania, are known to be hotspots for wildlife products, such as ivory and rhinoceros horn, departing the continent. Asia has the biggest market for illicit wildlife products. Seaports are key transit gateways for illegal wildlife products. According to the Elephant Trade Information System, up to 72% of ivory is trafficked by sea. Smugglers prefer trafficking by maritime routes for several reasons. First, several kinds of wildlife products, including ivory, rhino horn, and rosewood lumber are heavy and bulky. Therefore, discreet transport by air is both difficult and expensive. Secondly, it is nearly impossible to imagine universal container inspections upon arrival or departure in ports. Rather, ‘only about 20% of trafficked ivory from Africa is actually caught and seized when shipped through ports.’

Huge demand for ivory, rhinoceros horns, pangolin scales, rosewood, and other illegal wildlife products, drive trade internationally. Rhinohorn and pangolin scales are purported to have medicinal benefits in Traditional Chinese Medicine, though the actual benefits are widely disputed by medical professionals globally. Pangolin meat is also considered a delicacy in many parts of Asia. Significant markets for illegal wildlife products survive in Thailand, China, the United Arab Emirates, and Saudi Arabia. Despite hundreds of poachers being arrested every year for various wildlife crimes, the high-level kingpins “who really drive the international illegal wildlife trade” mostly evade consequences.

2.3.3.2 Socioeconomic Impacts

Wildlife crimes pose a serious threat to biodiversity, economies, and communities in the places where these crimes take place. The 2014 Ebola outbreak in West Africa as well as the COVID-19 pandemic have raised collective understanding of the potential toll of zoonotic diseases, which are transmitted between animals and people. ‘Research shows that as we degrade the natural world, these

---


120 Ibid.

Pile of animal tusks
Credit: Shutterstock/Pav-Pro Photography Ltd
diseases are more likely to spread.\textsuperscript{122} Despite the many terrible consequences, the international wildlife trade survives. \textit{Globally, the illegal wildlife trade is estimated to generate up to USD 23 billion annually, making it the fourth most lucrative illegal trade after narcotics, human trafficking, and counterfeiting.}\textsuperscript{123}

2.4 Mixed Migration

\begin{figure}
\centering
\includegraphics[width=\textwidth]{maritime_security_threat_4}
\caption{Maritime Security Threat #4: Mixed Migration}
\end{figure}

2.4.1 Current Context

The term \textit{mixed migration} refers to: (1) human smuggling, by which people choose to pay a smuggler to transport them, and to (2) cross-border movements of people, which includes refugees fleeing persecution and conflict, victims of trafficking, and people seeking better lives and opportunities.\textsuperscript{124} It is important to note that a single individual can be both a victim of human smuggling and human trafficking - often on the same voyage, as smugglers extort their passengers for a higher sum than what was originally agreed upon and force them into labour situations when they are unable to pay.

Migration is common across Africa, and the same is true for the countries of the WIO region. A person may choose to migrate domestically or internationally. As this report is concerned with maritime routes, the focus of this discussion is on international migration by maritime routes.

An array of conditions may motivate a person to pursue migration and many countries from which migrants emigrate experience several crises simultaneously. These include endemic poverty, natural disasters, or general instability, resulting from political disarray or conflict. A desperate economic situation in one’s country of origin may lead to the belief that there are better conditions outside the country. Oftentimes, this belief leads migrants from Africa to attempt to reach Europe or the Middle East. Natural disasters such as the 2011 famine in Somalia and Cyclones Kenneth and Idai in southern Africa spurred migration too. Violent internal conflicts in Somalia and Mozambique have resulted in migrants seeking refuge outside their countries.

\textsuperscript{122} Ibid.
\textsuperscript{123} Ibid.
\textsuperscript{124} Mixed Migration Centre, “MMC East Africa & Yemen, Quarter 4 2021”: 2.
of origin. More recently, escalating political crises and civil war in Sudan and Ethiopia, respectively, are likely to spur mass migration. **Globally, the human smuggling market is estimated at between USD 5.5-7 billion USD (annually).** \(^{125}\) The COVID-19 pandemic had – and continues to have – sweeping implications on migration, both in the WIO region as well as globally. 'Extensive mobility restrictions have been implemented within and between countries in order to prevent the spread of the virus, leading to major changes in mobility patterns worldwide.' \(^{126}\) In 2020, 3.6% of the human population, or 281 million of international immigrants were counted globally. \(^{127}\) That same year, the International Organisation for Migration’s Missing Migrants Project recorded 4,202 migrants’ deaths during international journeys. IOM recorded 3,500 deaths globally in just the first nine months of 2021. \(^{128}\)

One of the most heavily trafficked maritime routes for migrants is that between the Horn of Africa and Yemen, as Africans attempt to reach the countries on the Arabian Peninsula and beyond, where they assume economic conditions are more favourable. However, since the onset of the conflict in Yemen, traffic on this route has increasingly grown in the other direction as Yemenis flee to Africa. Research organisations such as Mixed Migration Centre, which tracks East African refugees and migrants reported 27,693 arrivals in Yemen in 2021, down from 37,535 in 2020 and 138,213 in 2019. \(^{129}\)

Another highly trafficked route in the region is between the island of Anjouan and Mayotte. Migrants ‘cross a thin strip of the Mozambique Channel to reach Mayotte and the chance of a better life, usually on small *kwassa kwassa* fishing boats.’ \(^{130}\) Mayotte has ‘most of the trappings and advantages of an official French department-including membership of the EU’ \(^{131}\). There is therefore an assumption that a better economic outcome awaits there. One estimate suggests that between 7,000 and 10,000 migrants perished on the crossing to Mayotte between 1995 and 2012. \(^{132}\)

### 2.4.2 Socioeconomic Impacts

There are several ways to characterise victimhood when it comes to mixed migration: some migrants are economically taken advantage of by smugglers but ultimately reach their intended destinations; some migrants fall prey to situations of forced labour or commercial sex against their will, and some migrants perish on the journey to their intended destination. It is also very

---

\(^{125}\) Global Migration Indicators 2021, IOM UN Migration, 2021: 43.

\(^{126}\) Global Migration Indicators 2021, IOM UN Migration, 2021: 13.

\(^{127}\) Global Migration Indicators 2021, IOM UN Migration, 2021: 22.

\(^{128}\) Global Migration Indicators 2021, IOM UN Migration, 2021: 38.

\(^{129}\) Mixed Migration Centre, ‘MMC East Africa & Yemen, Quarter 4 2021’: 3.


\(^{131}\) Ibid.

\(^{132}\) Ibid.
difficult to name any one demographic as the primary victims of mixed migration schemes. “There is no single profile for trafficking victims; trafficking occurs to adults and minors in rural, suburban, or urban communities across the country.” However, globally in 2016, the United Nations estimated that 71% of trafficking victims are women and girls, and roughly 30% are children.

A large proportion of victims identified are women. Over time, a higher percentage of men have been identified, and it is acknowledged that men are also vulnerable to human trafficking. The proportion of children relative to adults for each age group is about the same.¹³³

Traffickers and smugglers are known to use tailored approaches to manipulate and control migrants. Whereas traffickers typically deploy psychological, physical, or sexual abuse on female victims, traffickers are more likely to control male victims using false promises and ‘labour related methods such as withholding of earnings and excessive working hours.’¹³⁴ Child trafficking is more common in West Africa than in the rest of Sub-Saharan Africa whereas a larger proportion of adults were known to be trafficked in East Africa. ‘Girls are rarely detected in East and Southern Africa.’¹³⁵

2.4.2.1 Trafficked Migrants

While anyone could be trafficked, some people are more vulnerable than others. Significant risk factors include recent migration or relocation, substance use, mental health concerns, involvement with the child welfare system, and being a runaway or homeless youth. Often, traffickers identify and leverage their victims’ vulnerabilities in order to create dependency.¹³⁶

Victims of violence, sexual assault, survivors of war and conflict or social discrimination are easy targets. In other words, while a clear profile for trafficking victims does not exist, those migrants already in a vulnerable position are more likely to be exploited by traffickers. Smugglers and traffickers often exploit migrants’ economic disadvantage in transit or destination countries:

Recruiters located in home countries frequently require such large recruitment and travel fees that victims become highly indebted to the recruiters and traffickers. These fees are inflated far beyond cost in order to create economic instability and dependency on the new employer or trafficker. Traffickers leverage the non-portability of many work visas as well as the lack of familiarity with surroundings, laws, and rights, language fluency, and cultural understanding in order to control and manipulate victims.¹³⁷

¹³⁴ Ibid.
In Africa, forced labour is the reality for an estimated 37 percent of trafficking victims, according to the Global Slavery Index.\textsuperscript{138} Forced labour may involve little to no pay for long hours in the agriculture, mining, and fishing industries, often in dangerous conditions with abusive environments.\textsuperscript{139}

Forced marriage is also a challenge for trafficking victims in Africa. In Africa, traffickers force an estimated 63% of victims into marriage without their consent, many of whom are children. According to the International Labour Office, forced marriage of young girls and women can be in exchange for money, paying off debt, or to settle disputes among families. Forced marriage can result in sexual and physical abuse, domestic servitude, and sexual exploitation. According to the Human Rights Watch, Africa and other governments included ending child marriage as one of their targets in the 2015 United Nations Sustainable Development Goals. Since then, UNICEF says several African countries have started to create and utilise preventative action plans and strategies to address child marriage.\textsuperscript{140}

### 2.4.2.2 Deaths of Migrants

Of the deaths and disappearances documented during international migration between 2014 and 2020, 9,938 were in Africa, of which 8,485 deaths were recorded, and 1,453 were estimated missing and presumed dead.\textsuperscript{141} Since 2014, the Missing Migrants Project estimated 525 migrants have died attempting the Horn of Africa to Yemen crossing, and 75 have died attempting the route from Anjouan to Mayotte.

---


\textsuperscript{139} \textit{Ibid}.

\textsuperscript{140} \textit{Ibid}.

\textsuperscript{141} Global Migration Indicators 2021, IOM UN Migration, 2021: 39.
2.5 Environmental Disasters

2.5.1 Marine Disasters in the WIO

The East African coast has some of the busiest international sea trade routes and is a major route for transporting oil. Over 30% of the world’s crude oil supplies and 80% of oil exports transit the wider Indian Ocean (IOC, 2020), thus leaving the region extremely vulnerable to shipping disasters.

The worst maritime disaster on record in the WIO’s modern history was the Katina P, which was disabled by a rogue wave on 17 April 1992. The vessel intentionally ran aground offshore of Maputo Bay, Mozambique, to prevent sinking at which point it had already lost roughly 3,000 tonnes of heavy fuel oil (ITOPF, 2021a). To avoid further leakage, it was towed out to sea for lightering to another tanker. While under tow, the vessel broke in two and sank on 26 April 1992, approximately 85 nautical miles off the coast of Mozambique.

More recently, in July 2020, the Japanese-owned bulk carrier MV Wakashio was stranded on a coral reef off the coast of Mauritius. By 10 August, roughly 1,000 tonnes of fuel had been spilled. Early salvage efforts were impeded by rough sea conditions and COVID-19-related restrictions. The National Oil Spill Contingency Plan was activated by the Mauritian Ministry of Environment, Solid Waste Management and Climate Change. On 6 August, damage to the ship’s hull resulted in approximately 800-900 tonnes of fuel oil leaking into the lagoon surrounding Pointe d’Esny, a protected marine park. (ITOPF, 2021c).

The Wakashio oil spill revealed weaknesses in the maritime response capabilities of the WIO (Bueger & Edmunds, 2020). Bueger (2020) noted that “the devastating oil spill in Mauritius sends a powerful reminder that for small states, such accidents are national security emergencies. They threaten the country’s economy and food security. Mauritius was not prepared for such an incident, and other small states urgently need to learn the lessons. A similar disaster could have occurred in Seychelles, [...] or elsewhere. Rapid response capacities are required.” Mauritius is heavily dependent on its tourism and fisheries sectors, and the disaster, which was visible from space, occurred at one of the country’s main marine tourist destinations. The economic consequences of the disaster will be felt for years, if not decades. It is considered a disaster of national security proportions considering the value of the pristine beaches and coral reefs for Mauritius (Bueger, 2020).
Case Study 2: Exxon Valdez oil spill in Alaska, USA

In March of 1989, the Exxon Valdez ran aground in Prince William Sound in the Gulf of Alaska, USA, spilling 11 million gallons of oil into the ecosystem. At the time, it was the worst oil spill in US history. The spill’s reach was enormous, impacting 1300 miles of shoreline along Alaska and resulting in the deaths of an estimated 250,000 seabirds, 2,800 sea otters, 200 harbour seals, 250 bald eagles, 22 killer whales, and billions of salmon and herring eggs.142

While many think of the Exxon Valdez as a primarily environmental disaster, the spill also had considerable implications for several industries as well as coastal communities. The spill may have had a role in the collapse of salmon and herring fisheries in the region, and with them, the fishing industry, and several coastal towns.143

Ultimately, Exxon paid approximately USD 1 billion in cleanup costs and an additional USD 1.8 billion to support habitat restoration and personal damages related to the spill.144 However, the cleanup effort had its limits; as recently as 2021, pockets of crude oil were detected in some locations.145

Case Study 3: Wakashio oil spill in Mauritius

At the end of July 2020, Mauritius suffered what would be the worst single environmental disaster of its history, when the MV Wakashio, a Japanese bulk carrier operated by Mitsui O.S.K. Lines ran aground into the Pointe d’Esny coral reef near the Mauritius coast. The ship began to leak fuel oil in the following weeks, and broke apart in mid-August 2020, with approximately 1,000 tonnes of heavy fuel oil leaking uncontained into an area sheltering some of Mauritius’ most sensitive ecosystems.

Soon after, the Mauritian Government issued a statement in which it committed to do whatever was necessary to assist all those affected by the ecological catastrophe. Besides financial help, the Government committed to restore, reconstruct, and repair the damages caused by the MV Wakashio.

To control the spill and minimise its impacts, Mauritian authorities isolated environmentally sensitive areas of the coast while awaiting foreign assistance to pump out ~2,500 to 3,000 metric tonnes of very low sulphur-fuel oil remaining onboard.

144 Ibid.
145 Ibid.
The grounding occurred in an area listed under the Ramsar Convention on wetlands of international importance and near the marine park of Blue Bay. Tourism plays a major role in the economy of Mauritius, representing about US$1.78 billion in 2019, and is centred around marine scenery and animals likely to be endangered by the oil spill. From 6 to 11 August, the spill expanded to over 26 square kilometers (10 sq mi).

The ship’s operator/charterer, Mitsui O.S.K. Lines pledged just over US$9.5 million in compensation. Wakashio is insured by the Japanese P&I Club for up to US$1 billion; the agency said it expected to pay at least some portion of the cost of the recovery effort.

Additionally, since then, the Government of Japan has accentuated its financial assistance to Mauritius. The support measures recorded from July 2020 to now include: technical assistance in the form of the Japan Disaster Relief Expert Team and the Japan International Cooperation Agency, equipment and materials to assist in clearing of the oil spill, a total grant of 1200, million JPY to set up “an effective coastal radar surveillance system”, grant of 600 million JPY for the acquisition of geotechnical equipment by the Ministry of National Infrastructure, a grant of 300 million JPY and a loan of 30 billion JPY for COVID-19 measures. In total, the financial assistance of the Government of Japan to Mauritius has since amounted to a grand total of USD 255 million.146

---

2.5.2 Current Context

Despite decades of policy work, countries party to the 1985 Nairobi Convention\(^{147}\) still possess varying capabilities to respond to marine pollution incidents, including equipment and personnel (Figure 7-1 in Annex page 122). During a recent oil spill preparedness workshop in Zanzibar, these countries asked for annual communication drills and joint multilateral exercises to ensure regional cooperation (Swanepoel, 2020).

For small states, an oil spill poses an obvious threat to the national economy but also to public health, as spilled oil can leach into water supplies and poison marine and coastal ecosystems. As such, spills should be regarded as issues of national security. As it currently stands, however, the attention of small state fleets, coast guards, and other maritime security forces is largely focused on blue crimes, such as piracy, smuggling, or illegal fishing. Many experts believe that insufficient attention has been paid to maritime disaster response and prevention (Bueger, 2020). Island states, such as Seychelles, Mauritius, Madagascar, and Comoros, who depend heavily on the sea, need to urgently review their maritime disaster response plans as part of their national security strategies.

2.5.3 Socioeconomic Impacts

In addition to the costs incurred from spill clean-ups, serious financial losses are often incurred by sectors that rely on clean seawater and coastal areas, such as commercial fisheries and tourism. (ITOPF, 2014). Overall, the following have been identified by ITOPF (2014) as key impacts of marine oil spill on social and economic activities:

- A wide range of industries that rely on clean seawater can incur substantial losses following an oil spill. The fisheries and tourism sectors are frequently the most seriously affected.
- Although enclosed port waters offer optimum conditions for spill response, the need to minimize disruption to port activities means working around ship movements and can result in extended clean-up operations.
- The consequences of a precautionary shut down of a power station or desalination plant may have far-reaching consequences and may be unnecessary if measures can be put in place to maintain operations.
- Other activities, such as the production of sea salt, coastal engineering, and even agriculture have all been adversely affected by oil spills. Where feasible, contingency plans should consider measures that could be used to mitigate impacts.

\(^{147}\) Protocol for the Protection of the Marine and Coastal Environment of the Western Indian Ocean from Land-Based Sources and Activities. The parties are Comoros, France, Kenya, Madagascar, Republic of Mauritius, Mozambique, Republic of Seychelles, Somalia, the United Republic of Tanzania and Republic of South Africa. (https://www.unep.org/nairobiconvention/who-we-are/contracting-parties)
Vessels at container terminal in port of Dar es Salaam, Republic of Tanzania.
Credit: Shutterstock/Druid007
CHAPTER 3
Emerging Threats
3 Emerging Threats

The Western Indian Ocean represents a complex region with a constantly evolving security picture. In addition to the maritime crimes which are currently observable in the WIO region, several threats deserve consideration, despite not yet representing full-blown risks to the region. These include climate change, illegal dumping, maritime terrorism, coastal conflict, and crude oil theft. It is especially not difficult to imagine the latter two activities finding a quick foothold in the region. Maritime terrorism attacks have to this point been few and far between. However, when such attacks do occur, they can be devastating. This was demonstrated by the three-day siege against the city of Mumbai by Lashkar-e-Tayyiba in 2008. It resulted in 12 bombings in Mumbai over 4 days, killing 175 people. The terrorists had reached Mumbai via sea. Given the number of violent nonstate actors operating near maritime areas, including Al-Shabaab in Somalia and Ahlu-Sunnah-Wa-Jam’ah in Mozambique, and the porous nature of maritime boundaries in the region, the threat of such groups adopting maritime capabilities is a real one, and one which would considerably expand the reach of insurgent groups. Worryingly, both groups have previously exhibited some degree of familiarity and comfort with using the maritime space.

Crude oil theft was observed for decades in the Gulf of Guinea region, and as the region continues to build an offshore oil and gas industry, attacks targeting offshore oil infrastructure and personnel of oil majors should be considered. Crude oil theft can result in violence against offshore installation and tanker crews, as well as considerable environmental degradation resulting from spills during illicit ship-to-ship transfers.

The next section will detail some maritime challenges which may emerge in the WIO region.

3.1 Climate Change

Whereas many of these threats are hypothetical, climate change represents an immediate threat to the region, which will continue into the foreseeable future. While oil spills and other disasters have clear, immediate impacts on marine ecosystems, climate change has the potential to wreak even greater havoc on the region’s maritime security in the
long term. Though contributing relatively little to global emissions, Africa is highly vulnerable to climate change. Its manifestation in the WIO can heighten all threats discussed previously in this report.

Firstly, the climate change-induced vulnerability of the WIO fisheries industry may worsen the vulnerability due to IUU fishing. Ocean warming and acidification contribute to the decline of some marine resources in the region, including corals, mollusk, and fish production and diversity (Hilmi, et al., 2015). In addition, a rise in sea level may hasten the degradation of coral reefs and other habitats; and the depreciation of harbours and other coastal facilities (Oppenheimer, et al., 2019). Relatedly, the rise of sea level may impact the durability and attractiveness of coastal tourism physical and natural assets thereby threatening the region’s tourism industry. This will further pressure the livelihoods and security of fisheries- and tourism-dependent communities in the WIO.

Secondly, climate change has already worsened and will continue contributing to elevated migration levels in Africa. There is a small but growing body of research exploring the evidence and potential for climate change to be the primary driver of displacement and migration, including in East Africa. By some projections, East Africa could see between 6.7 million to 10.1 million climate migrants by 2050 on average, with out-migration “hotspots including the “coastal regions of Kenya and Tanzania, western Uganda, and northern highlands of Ethiopia”. (Kumari Rigaud, et al., 2018). These projections include the effects of climate change not exclusive to the maritime space, for example, rising temperatures and droughts, and the associated impact on rainfed agriculture. Coastal zones and island States could also experience large out-migration due to sea-level rise, storm surges, and the resulting decline in land availability. For example, 750,000 people are projected to migrate out of the East African coastal zone between 2020 and 2050 due to climate change (Oppenheimer, et al., 2019).

Thirdly, and more broadly, as climate change negatively affects a wide range of economic activities in the WIO, this may nudge disadvantaged populations into illicit income-generating activities. Therefore, climate change may indirectly contribute to a rise in piracy and the trafficking of arms, drugs, and wildlife. It also has the potential to spark more transboundary conflict as countries contest diminishing maritime resources (Blasiak, et al., 2017).

3.2 Crude Oil Theft

The threat of crude oil theft in the Western Indian Ocean region is not comparable to such crimes on the other side of the continent, where oil theft for a time posed a significant challenge to governments and oil majors. The WIO region does not present the hub for the oil and gas industry that the Gulf of Guinea and the West and Central African regions do, but an estimated 9% of total seaborne-traded petroleum transits through the Bab el-Mandeb Strait.148

---

Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

Crude oil tanker at sea Credit: Shutterstock/Dedi57
Moreover, the discovery of oil reserves off the coast of Mozambique provides the country with tremendous offshore production potential.

Over the coming decade, Mozambique is expected to become a major liquefied natural gas (LNG) exporter due to the discovery of over 180 TCF of natural gas reserves in the Rovuma basin in the north of the country.\textsuperscript{149}

Given the rise in activity by Ahlu-Sunna-wa-Jammah (ASWJ), a violent armed insurgent group in Northern Mozambique, keeping an eye on the potential for crude oil theft in the region as the oil and gas industry continues to evolve, is prudent.

While incidents of this kind pose an obvious financial threat and demonstrate the potential cost to human safety and security, incidents such as the MV \textit{Wakashio} push us to also consider the unique and fragile ecosystem that can be affected in the WIO region. The risk of spills goes up considerably when transfers are being conducted by untrained personnel - namely, crude oil thieves - offering another compelling reason to prioritise their prevention.

### 3.3 Illegal Dumping

Developed countries produce huge amounts of waste, particularly electronic waste. These have been documented dumping industrial and e-waste in the waters off of developing nations. Environmental NGO Greenpeace explains the behavior in terms of ‘the cost of managing and disposing of this waste safely …governments began exporting the problem to developing countries where environmental and workplace legislation is either inadequate or unenforced.’\textsuperscript{150} In essence, waste containers were shipped to the places with the weakest legislation and the least amount of government pushback.

According to several governments in the WIO region, several foreign countries use the waters off of African States ‘as a dumping ground of toxic waste, even after the enactment of legislation aimed at ending the practice by the European Union.’ The primary offenders are the United States and some member states of the European Union.

The worst examples of such dumping in the recent past, according to a report by the international environmental campaign group Greenpeace, is at the Somali port of Eel Ma’aan, north of Mogadishu.

Greenpeace alleged that they were in possession of photographs showing shipping containers carrying toxic waste inside the Eel Ma’aan port in the 1990s.\textsuperscript{151} According to Greenpeace, in 2003, EU states adopted tough

\begin{center}
\textbf{European countries produced roughly 1.3 billion tonnes of household and industrial waste annually.}
\end{center}

\textsuperscript{151} Greenaction defines environmental racism as the disproportionate impact of environmental hazards on people of color.
regulations on e-waste but nearly 70 percent of e-waste remains ‘unaccounted for.’ European countries produced roughly 1.3 billion tonnes of household and industrial waste annually, in addition to 700 million tonnes of agricultural waste. Since the London Convention of 1993 banned ocean dumping of industrial and radioactive waste, dumping operations off the coast of Somalia have been noted, but remain unverified. ‘Between 1988 and 1994, Greenpeace revealed 94 attempted or actual cases of hazardous waste exports to Africa, involving over 10 million tonnes of residues.’

Illegal dumping poses considerable hazards to the marine environments in which materials are dumped, but there are public health considerations as well. Toxic waste dumping in the Gulf of Guinea has been equated to ‘environmental racism.’ One unsubstantiated claim argued that the toxic waste which washed ashore along Somalia’s coast following the Indian Ocean tsunami of 2004\[152\] spurred piracy off the Somali coast.\[153\] While at the time of writing, illegal dumping does not appear to be pervasive in the WIO, the consequences of such activity can be devastating - environmentally, socially, and economically - and countries in the region are correct to aim to prevent it.

### 3.4 Maritime Terrorism and Coastal Conflict

Violence at sea has been exacerbated by the spillover of land-based threats where Interstate conflicts and terrorist attacks ...are increasingly affecting the safety of navigation in the Indian Ocean area, notably in the Red Sea, the Bab-el-Mandeb Strait, the Arabian Gulf and the Northern Mozambique Channel.\[154\]

While maritime terrorism has yet to evolve into a full-blown crisis in the WIO region, maritime attacks by various terrorist organisations exist within the realm of possibility, as has been demonstrated by a handful of attacks dating back to 2000, with the attack on the US warship, the USS Cole. In October 2000, the US Navy destroyer, the USS Cole was attacked in the port of Aden, Yemen as it refueled.\[155\] The Cole’s assailants, who were found to be affiliated with al Qaeda, exploded a small boat as it pulled alongside the destroyer, ripping a hole in the ship’s hull, killing 17 on board.\[156\]

Since the attack on the Cole, ‘militants have grown more sophisticated in their maritime strategies, using drone boats, floating mines, and even maintaining their own maritime fleets.’\[157\] In 2008, 10 Pakistani men associated with Lashkar-e-Tayyiba

---


\[156\] Ibid.

traveled from Karachi to Mumbai by sea. They hijacked a fishing trawler along the way and killed the vessel’s crew before docking the stolen trawler in Mumbai and then taking the city under siege for three days. The attacks resulted in the deaths of 166 people.

Further, violent conflict in coastal regions can spill over into the maritime domain, as has been observed in Yemen. In 2014, Houthi insurgents in Yemen took control of Sana’a, the country’s largest city, demanding a new government. This launched a civil war that has raged since. By all accounts, the conflict is now the world’s largest humanitarian crisis, with 100,000 people estimated to have been killed since 2015. Starting in 2017, the Houthis have employed the use of maritime drones, also known as unmanned surface vehicles, drone boats, or water-borne improvised explosive devices, to attack vessels and port infrastructure.

While only one of these attacks to date has led to the loss of lives, others have caused material damage to a number of ships and led to the temporary shutdown of one of Saudi Arabia’s busiest ports.

---

161 Ibid.

By all accounts, the Yemen conflict is now the world’s largest humanitarian crisis, with 100,000 people estimated to have been killed since 2015.
“In 2019, the Houthis targeted ships in the southern Red Sea with remotely controlled water-borne improvised explosive devices (WBIEDs) and sea mines. Seizures of vessels by the Houthis were also reported” (One Earth Future, 2020). In 2019, three vessels were seized by the Houthis during two incidents. “On 15 November 2019, the South Korean-flagged tug Woongjin T-1100, towing the oil platform Woongjin G-16 with 16 crew members on board, strayed into Yemeni water due to bad weather.” (One Earth Future, 2020) The vessels were released five days later, on 20 November 2019. This trend has unfortunately continued with 17 related events in 2020 and 19 in 2021.

Table 3-1: Number of maritime Incidents related to Yemeni Conflict

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>17</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: RMIFC

In the WIO region, non-state actors in both Somalia and Mozambique have exhibited a degree of capability in expanding their operations into the maritime domain. In Somalia, Al-Shabaab has demonstrated an aptitude for maritime attacks and has anecdotally developed relationships with former pirate kingpins.

In 2011, Al-Shabaab established control over the ports of Kismayo and Mogadishu, which initiated a shift to a more maritime-focused portfolio and further cemented their pursuit of criminal financial activities. Although it eventually lost direct control over these strategic ports, largely due to successful African Union Mission to Somalia-led offensives, Al-Shabaab has found creative ways to reinvent their activities in Mogadishu and maintain a maritime presence.163

Links to Somali pirate leader known as ‘Garfanje’ have also provided Al-Shabaab with an avenue to acquire weapons, primarily via maritime routes. Garfanje has allegedly lent his fleet of boats to Al-Shabaab members.164 Additionally, “an attack on 3 April 2019 on a fishing vessel southwest of Mogadishu, during which a fisherman was killed, was claimed by Al-Shabaab. The Lower Shabelle area was seized by Al-Shabaab shortly before the attacks. In 2018, attacks on ships by Al-Shabaab were also reported in this region. In a similar attack in July 2018 off Lower Shabelle, the landing craft Alpha Kirawira came under mortar attack near the Port of Baraawe in Somalia” (One Earth Future, 2020).

Several thousand miles south of Somalia, Ahlu-Sunna Wa-Jama’a (ASWJ) has similarly experimented with maritime tactics. In March of 2020, members of ASWJ landed two speedboats in the port city of Mocímboa da Praia in the Mozambican province of Cabo Delgado.

---


164 Ibid.
As they attacked the port from the Indian Ocean, several other ASWJ militants approached overland from the west. The insurgents overran local security forces and killed dozens of soldiers and police. They also captured a weapons cache at the town’s military barracks, raided banks, freed inmates from the local prison, looted the local hospital for medical supplies, and forcibly displaced an estimated 24,000 civilians.\textsuperscript{165} Months later, ASWJ seized control of the port city.\textsuperscript{166}

In August 2020, following a series of reconnaissance missions against coastal towns, members of ASWJ “attacked and occupied” Mocímboa da Praia. Some experts indicate that ASWJ’s attacks on coastal towns illustrate ‘an unexpected comprehension of advanced tactics, such as indirect fire and maritime approaches.’\textsuperscript{167} Two HSI32 interceptors deployed in the wake of the attack were attacked by ASWJ and one of the vessels sank after it sustained a hit from a rocket-propelled grenade fired from the shore.\textsuperscript{168}

ASWJ is increasing their attacks against islands off the coast of Cabo Delgado and utilising maritime routes to move fighters and loot resources. The recent string of island-hopping attacks embodies a strategic effort by ASWJ to expand the group’s area of maritime control, secure free movement, and establish a zone of power projection.\textsuperscript{169}

In April of 2021, French oil giant Total indefinitely suspended its USD 20 billion liquefied natural gas project, largely due to the increasing activity of ASWJ in the area.\textsuperscript{170}

\textsuperscript{165} Ibid.
\textsuperscript{166} Ibid.
\textsuperscript{167} Ibid.
\textsuperscript{168} Ibid.
\textsuperscript{169} Ibid.
\textsuperscript{170} Ibid.
Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

View to the Blue Water Port on the Red Sea, Massawa, Eritrea.
Credit: Getty Images/Dave Primov
4 Regional Efforts

Over the past two decades, several regionally-led maritime security initiatives have emerged to combat an array of illicit maritime activities. Many of these frameworks have their origins in the international efforts to address piracy in the region from 2005 to 2012 but have since expanded to address a comprehensive list of threats in coastal and maritime areas across the region.

While international support to the region to fight piracy was undeniably welcome and effective, the crime of piracy was unique in its impact in that it targeted international shipping, delaying shipments, and took international crews hostage. Much of the support given to other maritime threats is the result of geostrategic interests (such as the situation in Yemen) or because the donor government has some nexus to the recipient country through shared heritage (such as France’s support to Mauritius following the oil spill involving the *Wakashio*.) However, a major gap in the region’s maritime security frameworks, and the international community’s support of them, is that most of the money invested in maritime security initiatives is funneled into temporary projects and initiatives rather than permanent solutions. This crystallises a framework in which programming is largely reactive rather than proactive. It was this lack of preparedness that initially enabled a threat like piracy to rise to crisis levels off the coast of Somalia.

The following sections will examine some of these efforts in more detail.

4.1 Maritime Security in Eastern and Southern Africa and Indian Ocean

The European Union’s programme to promote Maritime Security in the Eastern and Southern Indian Ocean, also known as MASE, was established ‘to strengthen the capacity of the Eastern and Southern Africa and the Indian Ocean in the implementation of the Regional Strategy and Action Plan against Piracy and for Maritime Security.’

“The EU-funded MASE Programme, regrouping the regional community (IGAD, EAC, COMESA, and IOC) has embarked on collective actions to set up a strong, cutting-
The programme’s five primary pillars are implemented by regional partners. The pillars include addressing livelihood concerns of coastal communities against piracy in Somalia (implemented by IGAD); enhancing legal, legislative and infrastructural capabilities to combat piracy and other maritime crimes (implemented by the East African Community); dismantling financial networks linked to maritime crimes and minimizing their economic impact (implemented by Common Market for Eastern and Southern Africa); and building and improving capacities for surveillance and control and sea; and promoting and coordinating exchange of maritime information (both implemented by IOC.)

Under the MASE Programme, the Indian Ocean Initiative (Figure 4-1) leads an initiative to develop a maritime security architecture based on two regional centres and employs two regional centres: the Regional Maritime Information Fusion Centre in Madagascar and the Regional Coordination and Operations Centre, based in Seychelles. Signatory countries include the Union of Comoros, Djibouti, Madagascar, Mauritius, Seychelles, France, and Kenya. “Signatories to the two regional agreements signal their political commitment to a regional maritime security architecture in the Western Indian Ocean. The regional agreements establish a strong capacity for Maritime Domain Awareness (MDA) through the RMIFC and the RCOC are enabled by ‘MAS’, a specially-developed Maritime Awareness System that offers a cutting-edge technological solution to the tasks of monitoring and surveillance in the maritime domain. This newly developed maritime security architecture enables signatory countries to play a prominent role in building the maritime intelligence needed to deliver maritime security in the Western Indian Ocean” (IOC, 2020). The MAS enables the exchange of information, as well as the coordination of joint maritime actions.

The Programme represents “an example of cooperation and pooling of resources to tackle common issues and overcome national limitations” (IOC, 2020). This is evident in the way in which the MASE programme targets specific threats, such as IUU fishing. The RMIFC tracks incidents of maritime crimes across the region, which allows for the identification of criminal patterns. For example, RMIFC reported 343 cases of IUU fishing from 2017 to 2020 and detailed where incidents occurred and what actors were responsible for IUU fishing activity. Noting that several of the countries in the region possess limited capability for monitoring and surveillance of maritime spaces, strong data allows countries to pool resources to combat IUU fishing in the area, as with the Smartfish programme in the southwest Indian Ocean, supported by the European Union. RMIFC notes that, as recently as 2020, countries in the region continue to show their ‘desire and ability to confront the challenges of IUU fishing together.”

---

172 Ibid.

173 Dr. Navi Ramgolam, “RMIFC’s Approach Towards Evolution of IUU Fishing in the WIO in the past four years (2017 to 2020)” Regional Maritime Information Fusion Center, December 2021.

174 Ibid.
The MASE programme was initiated in 2013 and the mandate is set to expire in 2022. The Programme’s costs to date are fully funded by the European Union through the end of 2022. Table 4-1 provides estimates of costs to continue and to fully operationalise the programme. From 2023, the MASE programme would require USD3.5 million to cover its regional operations; USD300,000 to cover functions in each of its seven signatory states; and an additional USD250,000 for hosting the two regional centres. These are nominal costs, which when juxtaposed against the significant economic and social losses that may be deterred through the full operationalisation and strengthening of the MASE Programme Architecture.

Towards the full operationalisation of the Architecture for Maritime Security for the Western Indian Ocean to promote Blue Economy and address challenges emerging from illicit maritime activities

2022 marks an important milestone in the operationalisation of the Architecture for Maritime Security (AMS) for the WIO (Indianocéanie) [AMS-I], which has reached its Initial Operational Capability. AMS-I now needs to achieve full operational capability using existing assets/means at national and regional levels. Future additional investments as described below should start from 2023 to keep up the momentum for the full operationalisation of AMS-I seamlessly and include the following:

1. **Capacity building for the full operationalisation of the AMS-I:**
   - National institutional capacity building for countries' full participation in AMS-I with a focus on their internal process (national strategies, national coordination, and processes), structures (national centres and human resources);
   - Capacity for legal finish for addressing all illicit maritime activities;
   - Technology and human resource development for MDA with a focus on the Regional Maritime Information Fusion Centre, the Regional Coordination Operations Centre, the national centres, and their secured networking and operations, including into the wider Africa, the Indian Ocean, and the Pacific zones.

2. **Sustained financing of the already established coordinated regional actions at sea**

3. **Full operationalisation of and deepening of the AMS-I in each of the planks of maritime security**

   1. **Capacity building for the full operationalisation of the AMS-I**

      1.1 **National institutional capacity building**

      The AMS-I’s full operationalisation rests on participating countries' capacity to play their roles effectively.

      **The issue: There is a lack of national-level institutional and operational capacity to effectively participate and benefit from AMS-I.**

      To address the existing constraints, capacity building is needed around the following:

      - Regular update of **National Maritime Security Strategies** which should provide to the concerned State a global view of the maritime security situation targeted monitoring of the maritime areas of interest and enable identification of national priority actions.
Proper functioning of National Maritime Security Committees which should formulate, implement, and regularly assess National Maritime Security Strategies and related policies. It should facilitate sharing of relevant information on all maritime activities, including illicit activities on a regular basis, promote inter-governmental collaboration in charge of state actions at sea, support cooperation among projects in the maritime sectors (port security, fishing, blue economy) at the national level for better coordination and multi-agency and multi-sectoral approach, namely during exercises and operations, and for better optimisation of the shared objectives.

Full operationalisation of the National Maritime Information Sharing Centre which services the NMSS and all its members responsible for illicit maritime activities. The Centre should aim to acquire advanced knowledge of the maritime sector and security issues. It should be linked to other Centres in neighbouring countries and international partners, facilitate the internal transmission of information and interaction with other national, regional and international Centres. The Centre should facilitate the transfer of technologies and equipment and the dissemination of the latest information on the tactics, techniques, and procedures of maritime law enforcement agencies; contribute to the design of practical and operational tools for collecting, gathering, analysing, and disseminating information on maritime crimes and security.

Expected objective: Countries develop adequate national institutional capacity to understand MDA, monitor maritime security issues of interest, and formulate, implement and evaluate maritime security policies and actions.

1.2 Capacity Building: Legal finish

The issue: the legal basis for sanctioning illicit activities at sea remains largely inadequate in the region.

Provision has already been made under the MASE Programme to assess:

- the national legal frameworks relative to illicit maritime activities priorities
- the level of incorporation or ratification of the relevant international conventions in relation to illicit activities at sea; and
- the compatibility/harmonisation of the legal provisions in the region.

The ongoing assessments will also determine the existence or the absence of the provisions for violation of the laws on maritime crimes, the various provisions relative to maritime crimes, the applicable
sanctions (and the degree of harmonisation between the regional signatories), the jurisdiction concerning incidents of maritime crimes, the laws of evidence, the laws of criminal proceedings and the existence of extradition treaties and/or of mutual legal assistance between the regional signatories. This assessment, which concerns the signatory States (excluding France), will provide input for a judicial reform aimed at removing obstacles in the fight against maritime crimes both at national and regional levels along the intervention chain (information, intervention, prosecution, custody).

There is need for highly specialised investigative, arrest and prosecution, and legal support to the region and facilitation for sustained interactions among countries to address the above gaps and thrive to prosecute all illicit maritime activities.

**Objective:** the countries in the region develop a solid national and regional legal basis for prosecuting crimes at sea which acts as a strong deterrence

1.3 Technology and human resource development for Maritime Domain Awareness

The Regional Agreement for Exchange and Sharing of Maritime Information in the WIO has enabled the establishment of the RMIFC in Madagascar. The role of the RMIFC is to ensure the monitoring in near-real-time of the maritime zone as provided in the MASE agreement by integrating and merging maritime information, improving the knowledge of the maritime sector, facilitating and promoting the exchange and sharing of maritime information, and the networking with national, regional and international institutional partners. Its core function is to identify Vessels of Interest (VOI) or vessels that require further inspection. For the AMS-I to be fully operationalised, the RMIFC should enable the monitoring of vessels across several maritime zones as well and this can be achieved when all the Centres are linked to each other including outside the WIO regions. The ultimate aim is the development of a comprehensive maritime picture and intelligence on vessel movements, followed by identification of VOI and their inspection to be facilitated by the RCOC.

**The issues:** The RMIFC, the RCOC, and the national Centres are not adequately equipped whether in terms of specialised skills and know-how or optimum use of available technology for MDA and play their roles effectively.

More specifically,

- many countries do not have an adequately structured or equipped operational centre.
the regional Centres have been equipped but needs adequately trained personnel and the systems in place need regular update and maintenance.

the national, regional, and international centres are not securely linked to each other for ensuring the monitoring of vessels across several maritime zones and exchange of maritime information among the community of users and maritime operations.

There is need to sustain the operations of the centres and establish a Disaster Recovery System to ensure business continuity.

**Objective:** The regional and national centres are adequately equipped and linked through a secured network to sustainably monitor the movement of all vessels and identify VOIs in the region.

### 2. Support for the regional coordinated action at sea

**Situation analysis:** WIO countries have vast EEZ with limited assets for inspection of VOI resulting in very few being inspected especially as they cross many maritime zones. The existing system does not constitute an adequate level of deterrence to maritime crimes. Under MASE, a regional agreement has been signed for coordinated actions at sea to be facilitated by the RCOC. This enables pooling of scarce assets and maritime crime in one maritime zone can be inspected in another. Moreover, a financial mechanism established under MASE, though delayed in implementation due to the COVID-19 pandemic, is currently being tested to facilitate regional and international cooperation in accordance with the provisions of the MASE agreement, i.e. the assets remain under the responsibility of the country concerned. Partnerships are being concluded to assist, such as that with the EU Naval Force Somalia. An initial fund has been created under MASE for an amount of EUR 3.6 million implemented through grant contracts, designed, concluded, and monitored by the IOC to cover additional costs as compared to purely national inspections at sea.

The Regional Agreement for the Coordination of Operations at Sea in the WIO has enabled the establishment of a Regional Coordination of Operations Centres in Seychelles and is already operational. The role of the RCOC is to plan and coordinate the actions at sea that are of regional interest, and to facilitate regional and international cooperation with the institutional agencies and partners to ensure and promote maritime safety and security. The RCOC coordinates with the national institutional partners (centres of maritime operations) of the signatory countries to keep a register of national assets made available for coordinated maritime operations. The RCOC can also facilitate networking with other international naval forces and mobilise its support for serious and complex maritime operations.
The issue: Lack of national assets and means for regionally coordinated actions at sea.

Expected objective: reduce the assets gap for inspection of VOI and fully operationalise the mechanism for regionally coordinated actions at sea.

3. Deepening of the AMS-I on each of the maritime security issues

The AMS-I makes provision for a set of illicit maritime activities as follows:

- Cross-border crime organised by sea route which includes traffic of drugs and narcotics, arms dealing, coal smuggling, illegal immigration, human trafficking, illegal fishing, piracy, and armed robbery against ships
- Maritime terrorism and unlawful acts at sea against critical maritime infrastructure
- Dealing of massive destruction weapons
- Threats against freedom of navigation
- Environmental risks by intentional or accidental pollution, effects of climate change, and illegal or accidental rejects and immersions
- Violation of regulations for the protection of sea or underwater cultural heritage
- Search and Rescue.

The issue: The operationalisation of the AMS-I requires the establishment of a regional and national work plan for each of the above focus areas.

Those on Polmar and cable security have been developed and adopted already and that on human trafficking is in progress.

Objective: Countries and the region develop adequate capacity to address the challenges related to each of the illicit maritime activities

Annual recurrent cost estimates for AMS-I full operationalisation

The AMS-I is being operationalised using existing means and assets at national and regional levels. The cost estimates provided below constitute additional recurrent costs from 2023. The estimates do not include future investment costs and will vary according to the number of participating countries with the underlying estimate confined to the current seven signatory States of the AMS-I.
### Table 4-1: Annual cost estimate for the full operationalisation of the AMS-I

<table>
<thead>
<tr>
<th>Annual recurrent cost estimates</th>
<th>Regional Cost (€)</th>
<th>National Cost (€)</th>
<th>Host Country Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update National Strategies for maritime security</td>
<td></td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Coordinated actions at sea</td>
<td>1,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMIFC/RCOC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMIFC/RCOC maintenance/upgrade</td>
<td>1,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Centres maintenance/upgrade</td>
<td></td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Posting of ILOs at RMIFC/RCOC</td>
<td></td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>Host country costs for RMIFC</td>
<td></td>
<td></td>
<td>250,000</td>
</tr>
<tr>
<td>Host country costs for RCOC</td>
<td></td>
<td></td>
<td>250,000</td>
</tr>
<tr>
<td><strong>Legal finish for prosecution against illicit activities at sea</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National assessment of legal basis</td>
<td></td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Support for legal finish</td>
<td>500,000</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td><strong>Regional consultations/coordination</strong></td>
<td>500,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thematic Capacity building</strong></td>
<td>500,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost Estimates</strong></td>
<td><strong>3,500,000</strong></td>
<td><strong>300,000</strong></td>
<td><strong>250,000</strong></td>
</tr>
</tbody>
</table>

*Source: MASE Programme*
4.2 Indian Ocean Forum on Maritime Crime

The Indian Ocean Forum on Maritime Crime (IOFMC) ‘...is an informal forum that will bring together maritime states and international actors to focus on practical remedies and cooperation and to close some of the loopholes that allow crime to flourish ...’\textsuperscript{176} The IOFMC encompasses the countries of the Horn of Africa, East Africa, and the Indian Ocean region and involves law enforcement authorities, including police, anti-narcotics units, agencies targeting organised crime, and prosecutors.\textsuperscript{177}

The IOFMC aims to amplify cooperation and coordination across regional countries by providing an open and inclusive forum for discussion of transnational maritime crime issues and mutual cooperation and capacity building in relevant areas involving transnational organised crime.\textsuperscript{178} The Forum’s priority objectives include information sharing to build a mutual understanding of maritime threats, capacity building, and the development of multinational cooperative frameworks to assist in preventing and combating maritime crimes.\textsuperscript{179}

4.3 Djibouti Code of Conduct

The signatories of the Code of Conduct concerning the Repression of Piracy and Armed Robbery against Ships in the WIO and the Gulf of Aden, also known as the Djibouti Code of Conduct, agreed to cooperate in combating piracy and armed robbery against ships in the investigation, arrest and prosecution of persons, who are reasonably suspected of having committed acts of piracy and armed robbery against ships. This includes those inciting or intentionally facilitating such acts; the interdiction and seizure of suspect ships and property on board such ships; the rescue of ships, persons and property subject to piracy and armed robbery and the facilitation of proper care, treatment and repatriation of seafarers, fishermen, other shipboard personnel and passengers subject to such acts, particularly those who have been subjected to violence; and the conduct of shared operations - both among signatory States and with navies from countries outside the region - such as nominating law enforcement or other authorized officials to embark on patrol ships or aircraft of another signatory.\textsuperscript{180}

Representatives from the countries of Djibouti, Ethiopia, Kenya, Madagascar, Maldives, Seychelles, Somalia, the United Republic of Tanzania, and Yemen adopted the agreement in January 2009. Since then, Comoros, Egypt, Eritrea, Jordan, Mauritius, Mozambique, Oman, Saudi Arabia, South Africa, Sudan, and the United Arab Emirates have also signed.\textsuperscript{181}

\textsuperscript{176} Indian Ocean Maritime Crime Forum, “Indian Ocean Maritime Crime Forum Info Sheet.”
\textsuperscript{177} Ibid.
\textsuperscript{178} Ibid.
\textsuperscript{179} Ibid.
\textsuperscript{181} Ibid.
In 2017, the Djibouti Code of Conduct mandate was “expanded to include human trafficking and other illegal maritime activities in the WIO and the Gulf of Aden area” through what became known as the Jeddah Amendment. These other illegal maritime activities included human trafficking and smuggling; IUU fishing; trafficking in narcotics and psychotropic substances; arms trafficking; illegal trade in wildlife; crude oil theft; and illegal dumping of toxic waste. As with the original Djibouti Code of Conduct, signatories ‘declared their intention to cooperate to the fullest possible extent in the repression of trans-national organised crime in the maritime domain, maritime terrorism, and other illegal activities at sea.’ However, unlike combating piracy and armed robbery, the illicit activities outlined in the Jeddah Amendment required a more coordinated approach among multiple agencies at the national level. The DCOC framework continues to evolve to support regional countries in enhancing information sharing, at both the national and regional levels.

It was agreed that the implementation of the Djibouti Code of Conduct - Jeddah Amendment should take place using a framework that comprises ‘a Steering Committee, a Working Group on Information Sharing and a Working Group on Capacity Building Coordination.’ The Djibouti Code’s framework originally relied on three information-sharing centres, in Yemen, Kenya, and Tanzania. However, due to the ongoing conflict in Yemen, the centre there is currently non-operational.

### 4.4 Regional Coastal Management Programme

Regional Coastal Management Programme (ReCoMaP) is a regional programme for the sustainable management of the coastal zones of the countries of the Indian Ocean. It targets the coastal areas of the Indian Ocean Islands as well as East Africa, particularly Tanzania, Kenya, and Somalia. Core aims include Integrated Coastal Zone Management (ICZM), providing tools and training for policy development, planning processes, and monitoring within ICZM; providing support in improving Environmental Impact Assessments for the WIO region; setting up of National ICZM committees or providing help to existing committees, and setting up of National ICZM plans through these committees. The programme includes a broad spectrum of activities ranging from the collection of data on coastal regions and the development of monitoring tools through support for civil society organisations and training programmes to the pooling of information and examples of good practices relating to the management of coastal areas.

---


183 Ibid.

184 Ibid.

185 Ibid.

4.5 Indian Ocean Rim Association

The Indian Ocean Rim Association (IORA) was established in 1997 to connect the countries bordering the Indian Ocean and to encourage socioeconomic cooperation. Currently chaired by the United Arab Emirates, IORA has 23 Member States and 9 Dialogue Partners, ‘...with an ever-growing momentum for mutually beneficial regional cooperation through a consensus-based, evolutionary, and non-intrusive approach.’

IORA’s work includes several priority areas, including trade and investment facilitation, disaster risk management, and women’s economic empowerment. It also includes issues related to ocean policy, including maritime safety and security, fisheries management, and the blue economy. The issue of maritime safety and security was designated by IORA in 2011 as a high priority because of the importance of a secure maritime area for international trade and economic development.

IORA’s work on maritime safety and security includes several initiatives ‘(…) to enhance international cooperation in security and governance to successfully tackle the challenges faced by the region.’ These activities include the IORA Leaders’ Summit in March 2017 whose theme was “Strengthening Maritime Cooperation for a Peaceful, Stable, and Prosperous Indian Ocean”; the IORA Working Group on Maritime Safety and Security; the IORA Meeting of Experts on Maritime Safety and Security which produced a “Blueprint for Maritime Safety and Security in IORA,” intended “…as a base document for initiatives to be implemented by the Working Group”; and the Indian Ocean Dialogue …which is held annually… bringing together key representatives including scholars, experts, analysts, and policymakers from think tanks, civil societies and governments from IORA Member States to discuss pertinent issues including maritime safety and security.

4.6 Other Regional Efforts to Curb IUU Fishing and Overfishing

Regional initiatives to better monitor and manage IUU fishing include the Joint Management Area signed in 2012 between Mauritius and Seychelles was one of the first ‘transboundary’ management agreements involving the Extended Continental Shelf (ECS) and covering the continental shelf in the Mascarene region and associated Contiguous Adjacent High Seas Areas. This represents a joint management project that enables the two countries to identify and demonstrate new management approaches to securing rights to additional seabed covering over 400,000 square kilometres in the Indian Ocean.

---

189 Ibid.
190 Ibid.
Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

Ghost net. Abandoned fishing net pollution of ocean environment
Credit: Shutterstock/Rich Carey
There are Regional Fisheries Management Organisations (RFMOs) operating in the WIO with a mandate to adopt legally binding conservation and management measures for fisheries. The Southern Indian Ocean Fisheries Agreement (SIOFA) is a “General RFMO” with a wide scope, covering most species or types of species, and many different types of fishing activity. Within the WIO, its Contracting Parties include France, Mauritius, and Seychelles, as well as Comoros as a cooperating non-contracting party. Kenya, Madagascar, and Mozambique signed the Agreement but have not yet ratified it (SIOFA, n.d.). Another RFMO is the Indian Ocean Tuna Commission (IOTC) which, as its name suggests, was established to manage and conserve tuna and tuna-like species in the Indian Ocean. The IOTC has broad membership, with 30 Contracting Parties (including almost all States included in this study), but this belies poor compliance with IOTC measures, and efforts to manage or rebuild certain tuna stocks (WWF, 2021).
Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean

Nosy Komba, Madagascar
Credit: Getty Images / Kamil Sztandera
Conclusions and Recommendations
5 Conclusions and Recommendations

Blue Economy sectors, when developed sustainably, have incredible potential to contribute to national economic growth and livelihoods of coastal populations, in addition to facilitating the flow of commodities into and from landlocked countries. While the WIO region's blue economy possesses enormous potential for maritime sectors to develop, the maritime domain must first be secure.

The WIO region remains vulnerable to an array of maritime threats, which levy both direct costs on the region as well as unquantifiable social impacts. This report assessed the maritime threats of piracy and armed robbery against vessels, illicit trafficking of contraband, IUU fishing, maritime mixed migration, and marine disasters. The costs of maritime threats which are directly quantifiable amounted to roughly USD11 billion per year, owing primarily to the costs of IUU fishing. The costs attributable to IUU fishing include unreported catch and lost opportunities for coastal governments which lose out on licensing revenue to unregulated and unreported fishing activity. IUU fishing also risks the loss of marine biodiversity and diminished fish stocks, with effects on food security for coastal populations. Estimates suggest that over half of the value of all fish caught in the region in 2018 was unreported. Further, IUU fishing has been linked to several other kinds of maritime crimes, including weapons and drug smuggling, human smuggling and trafficking, and the use of slave labour on board fishing vessels, making it a security concern in addition to an economic and environmental one.

While piracy and armed robbery once posed a menacing threat to commercial shipping traffic in the WIO, particularly off the coast of Somalia, the threat to vessels is largely contained today due to the combined efforts from the shipping industry, the region, and international stakeholders. Many experts attribute the precipitous decline in incidents of piracy in the region to the use of vessel self-protection measures and the hiring of onboard privately contracted armed security personnel to deter pirate attacks. Naval patrols and a bolstered regional judicial system to carry out pirate trials have also mitigated piracy attacks. As of 2019, piracy cost the industry around USD 156 million annually in insurance, labour costs, ship protection measures, and private security. This figure is down from USD 238 million in 2017. This decline is explained by the reduced expenses, as well as decreased adherence to many ship protection measures, as the perception of risk to vessels continues to fall. Despite
the absence of piracy attacks in recent years, the factors which enabled piracy to flourish from 2008 to 2012 remain largely unchanged, and experts advise ships transiting the region to remain vigilant.

**Illicit trafficking**, the trade of legal products traded in informal markets, or the trade of illegal commodities by maritime routes remains widespread. In the WIO region, drugs represent the most trafficked illicit product. This is because the East African coast lies along the Southern Route for heroin originating in Afghanistan and intended for destination markets primarily in Europe and North America. Heroin and other drugs enter countries along the Southern Route after traveling by maritime routes. They are then transferred to small, coastal craft for landing at informal ports on unmonitored beaches, before traveling by air to destination markets in Europe and North America. They contribute to growing drug markets in the region along the way. As the middle class in Africa continues to grow, the recreational drug market is likely to grow with it, driving up the cost of illegal drugs in Africa and further encouraging drug syndicates to grow in African markets. Increased drug usage has negative impacts on public health, straining public health infrastructure. Furthermore, growing drug markets have been linked to increased violence, decreased trust in government and public institutions, and adverse economic effects in lost productivity and criminal justice costs.

Other items illicitly trafficked in the region include weapons, wildlife products, fuel, and other kinds of contraband. Conflicts in Mozambique, Ethiopia, Sudan, Somalia, and Yemen all contribute to the flow of arms in the region. Shipments of weapons have been noted traveling in both directions between Somalia and Yemen. Ports in East Africa, including Mombasa and Dar es Salaam, are known hotspots for wildlife products, including ivory, rhinoceros horn, and rosewood, among others. Most trafficked wildlife products from Africa depart for destination markets using maritime routes, because of the associated cost of air shipments of bulky and heavy products like ivory and lumber.

The term “maritime mixed migration” spans a multitude of activities, including human trafficking and human smuggling by maritime routes. In the WIO region, the primary maritime routes are those between the Horn of Africa (typically Djibouti or Somalia) and Yemen in the Arabian Peninsula and between the island of Anjouan and Mayotte. While the route between the Horn of Africa and Yemen has seen increased traffic in both directions, the Anjouan-Mayotte route is generally Anjouans seeking to reach French territory and access its benefits in Mayotte. Since 2014, an estimated 525 migrants have died attempting the crossing between the Horn of Africa and Yemen, and 75 are estimated to have lost their lives attempting the crossing between Anjouan and Mayotte. Despite the risks, migrants continue to pursue the possibility of better lives elsewhere for themselves, and their families. This is motivated by domestic economic and political crises, environmental disasters, climate change, or conflict. Meanwhile, traffickers and smugglers remain motivated by profit. The global smuggling market is estimated between USD 5.5 and USD 7 billion.
Finally, environmental disasters, including oil spills pose a grave risk to the region. Countries across the WIO have varying capabilities to respond to marine disasters, as seen during the MV *Wakashio* spill in the summer of 2020. Environmental disasters destroy marine environments and wildlife and even have public health implications for coastal populations as oil can leach into food and water supplies.

Several other threats merit consideration as maritime security cooperation continues to evolve in the region. Climate change, the effects of which are already being felt, exacerbates every other threat discussed in this report. Crude oil theft, as has been observed in West Africa’s Gulf of Guinea in the past is a possibility as the offshore oil and gas industry in the WIO continues to develop. Reports of illegal dumping, particularly of electronic waste, have been noted and can pose public health and environmental hazards, particularly if items wash ashore. Expanded maritime tactics by insurgent groups or violent nonstate actors, as seen in Mumbai in 2008, and Sri Lanka with the Liberation Tigers of Tamil Elam, increase the reach of violent actors. In the WIO, groups like Ahlu Sunna Waljama’a in Mozambique and Al-Shabaab in Somalia have exhibited some capability in using the maritime space to their advantage. Further, conflicts occurring in coastal areas can spill over into the maritime space, putting passing vessel traffic in danger. This is most obvious in a conflict like that in Yemen, and several incidents against vessels in the Red Sea and the Gulf of Aden can be directly traced to the violence there. Maritime incidents reported by the RMIFC related to the Yemeni conflict increased from seven in 2019 to 19 in 2021.

**Recommendations**

While the countries of the Western Indian Ocean have made great strides in cooperating on maritime security efforts, more can be done to secure the maritime domain. Regional frameworks, including MASE, the IOFMC, the Djibouti Code of Conduct, RCMP, and IORA have been instrumental in combating the region’s most pertinent threats by improving communication and coordination at the national and regional levels. Now that the international community has trained its eye on the WIO region’s maritime security environment for well over a decade, there are some important lessons learned which have been documented and can help to inform maritime security programming going forward.

**5.1 A Holistic View of Maritime Security**

First and foremost, historically speaking, maritime security efforts focused on single-issue challenges: there was no shortage of international donors funding programming on preventing piracy and armed robbery or stopping IUU fishing by foreign fleets operating in the region.

However, this leaves criminal actors with significant room to adapt. This has been observed with the synergies between illegal human smuggling operations and arms trafficking. Criminal actors have exhibited tremendous resilience in changing course in response to changing external factors which affect their business models.
Single-issue mandates risk not seeing the forest for the trees. In other words, the international community can point to several instances in which criminal actors were engaged in multiple kinds of illicit maritime crime simultaneously, such as the nexus between IUU fishing, slavery onboard fishing vessels, and trafficking in drugs or weapons. Similarly, single-issue mandates allow criminals to evade detection by shifting their focus to a new venture - either licit or illicit - in response to shifting international law enforcement priorities. It is well understood that every individual ever engaged with Somali piracy is not currently behind bars; in fact, it is well-documented that some former pirate kingpins are now prolific weapons smugglers in Somalia - and perhaps working in support of violent non-state actors there.\footnote{Robyn Kriel and Briana Dugan, “CNN Exclusive: Somali pirate kings are under investigation for helping ISIS and al Shabaab,” CNN, https://www.cnn.com/2017/07/10/africa/somali-piracy-attack-spike/index.html, 10 July 2017.}

Thus, going forward, it will be important for stakeholders to continue to take a comprehensive view of maritime security and maritime security threats on both the national and regional levels. Understanding how various maritime crimes and criminal actors interact with one another will help these regional actors to address challenges in the maritime domain both effectively and efficiently.

5.2 Addressing Limited Resources and Assets

Secondly, it is impossible to ignore the fact that many countries in the region suffer from limited resources, including but not confined to financial, human, and technological resources. Among these limited resources, several competing security priorities exist. Unfortunately, patrolling maritime domains is a critical piece of maritime enforcement capacity, and requires both assets and personnel, which many countries in the region lack. It is clear that countries in the region are at varying levels of maritime enforcement capability.

The gaps in maritime law enforcement, undercompliance with international safety and security standards, as well as insufficient regional cooperation, have all constituted exacerbating factors that continue to render the region's seaports highly vulnerable to illegal trafficking.\footnote{UNODC, “UNODC & Partners Protect Maritime Trade Routes in the Indian Ocean,” 4 February 2021: https://www.unodc.org/unodc/en/frontpage/2021/February/unodc-and-partners-protect-maritime-trade-routes-in-the-indian-ocean.html.}

Further compounding the issue of limited assets and personnel is that several States in the region, including Somalia, Madagascar, and all the island nations, possess enormous coastlines. Massive maritime domains make patrolling them exceptionally difficult. It is incumbent on regions to make the case to their governments to better prioritise maritime security. However, the international community can assist with this because Blue Economy sectors in the WIO region present an opportunity to several multinational stakeholders, given the shared nature of the Blue Economy. These Blue Economy sectors...
represent considerable economic potential, and the case must be made that they are worth investing in and protecting.

Fortunately, the WIO is a region in which several organisations are simultaneously aimed at combating a particular maritime threat, effectively maximising resources. For instance, the Regional Plan for Fisheries Surveillance (PRSP) is an EU-funded programme aimed at combating IUU fishing in the WIO region. The regional centres set up under the MASE programme have every interest in collaborating with the PRSP to combat IUU fishing. Moreover, oil and maritime pollution, are included in the mandate of the regional MASE centres, demonstrating how working with the states of the Nairobi Convention can improve the effectiveness of the regional centres regarding maritime pollution.

Further, piracy and armed robbery are the subject of a UN Security Council resolution enabling numerous naval forces to intervene off the coast of Somalia. In the absence of naval means capable of being deployed quickly in response to a piracy incident in the area, the MASE regional centres have an interest in working with the forces that are already deployed there to fulfil their mission. The same is true for other threats to maritime security. Other centres contribute to regional maritime security, like the MASE Centres. These are set up by the Djibouti Code of Conduct and the MRCCs.

The regional agreements under the MASE programme are evidence that signatory states can mutually ensure maritime security in the region through several states pooling their limited means. Looking forward, signatory states must agree to a common fund to support the operation of the MASE Regional Centres, to ensure that this important regional asset does not rely on external funding from outside of the region.

5.3 Multi-Agency and Multinational Communication

Thirdly, because historically many countries across the world viewed maritime security issues through a narrow lens, several national agencies were created, and missions developed with overlapping mandates. Meanwhile, these same actors are not currently sharing information that may be relevant to other agencies and the result of this compartmentalization is that no agency understands the full picture or can perfectly depict criminal patterns of behavior. This makes the prevention and disruption of crimes much more difficult. Besides, no single agency is in possession of all information about maritime security threats in national waters. Accordingly, establishing a system that encompasses all national agencies and departments with pertinent interest in the maritime domain, and allows for effective exchange of information, would be essential to improving the understanding of maritime security threats.

Further, the problem is exacerbated when zooming out to the regional level to identify where governments share information regionally regarding maritime security incidents. While some government agencies report to Information Fusion Centres in the region that can analyse data and discern patterns, this is not necessarily currently standard practice. To maximise information sharing in the region, countries will need to establish
bilateral agreements which detail what information can be shared and outline procedures for exchanging intelligence.

The way forward on issues of maritime insecurity in the WIO will require cooperation across national agencies and across governments throughout the region, whether the challenge is IUU fishing or maritime terrorism. The maritime safety mechanism set up within the framework of the MASE agreements includes the national centres of the signatory states and the two regional centres. This mechanism can only work effectively if it is based on national operational centres. Many signatory States of the MASE agreements do not yet have national centres which would bring together all government agencies working at sea and provide a complete picture of the maritime domain of each member state. Therefore, it is urgent that the signatory countries of the agreements create national centres as provided for by the MASE mechanism.

### 5.4 Addressing IUU Fishing and Adapting to Climate Change

IUU fishing has emerged as one of the primary challenges to maritime security the world over. The WIO region is no exception. To ensure the sustainability of regional fish stocks for future generations, it is essential that regional countries collectively prioritise bringing an end to IUU fishing activities. As has been discussed in this report, IUU fishing can lead to conflict and food insecurity and is linked to an array of other crimes. These security risks can be used to build a case to accelerate national political will to adequately resource programming to counter IUU fishing.

On the national level, it is critical that laws to address IUU fishing are codified into national legislation and enforced by appropriate authorities. While limited resources to combat crimes such as IUU fishing presents a challenge in the immediate term, enhanced search and interdiction capabilities are far less useful without sufficient regulations, oversight bodies, or inspections at ports. Further, it is essential that agencies at the national level share information about IUU fishing operations.

On the regional level and beyond, it continues to be imperative that relevant authorities improve sharing of information (for instance, between flag, port, and coastal states, as well as fisheries management bodies.) The use of data from region-wide incident reporting enables authorities to target IUU fishing hotspots, which allows for strategic deployment of assets for monitoring and surveillance operations. Finally, regional countries must cooperate in the training of port officials and monitoring authorities, as well as on monitoring and interdiction missions, which facilitates interoperability between maritime enforcement capabilities as well as helps to contribute to the problem of limited resources.
Fisherman selling the catch of the day (fresh lobsters) on the beach at Pemba, Cabo Delgado, Mozambique.

Credit: Shutterstock (Senderistas)
To address the impacts of climate change, coastal and island States need to continue improving coastal and habitat management, and other mitigation and adaptation measures. These should be in addition to global efforts to reduce emissions and other drivers of climate change.

5.5 Ensuring the Sustainability of the MASE Centres

Finally, MASE signatory States should accelerate codifying regional agreements into national legal codes so that they are applicable under the law across the region. In particular, this includes:

- Ratification and domestication of relevant regional agreements and international conventions by member States
- Participation in the MASE mechanism by all member States and inclusion of all zones beyond the control and surveillance of member States.193

The MASE programme was established to fight against all types of maritime threats, and the regional agreements adopt this holistic vision of maritime security. MASE regional centres should be able to work in synergy with regional and international organisations targeting the specific objectives of maritime safety and security.

States and partners must combine their efforts to sustain the achievements of the MASE programme, which is due to end in the coming months, under the terms of its current mandate. Funding of maritime security and MASE should not be left to external support only. So far, the greatest support comes from the EU. More regional financing is needed, particularly as the benefits of the Programme significantly exceed its costs. Consequently, a study on the sustainability of two CRFIM/CRCO centres, which would include the future statutes of the centres, their organisation, their composition, their financing, and their mode of operation, is essential.

193 Currently, some coastal countries in Eastern and Southern Africa (Somalia, Tanzania, Mozambique, South Africa) are not yet signatories to MASE agreements. MASE advocates for the integration of states in the region that are not members of the agreements.
Man and woman carry a large marlin fish on the tropical sand beach near the sea of Zanzibar island.
Credit: Shutterstock/OlegD
6 References


Rocking the Boat
The Socio-Economic Impact of Maritime Threats in the Western Indian Ocean


Global Fishing Watch. (2021). GFW Map. Retrieved from GFW Fishing map: https://globalfishingwatch.org/map/?start=2020-01-01T00:00:00Z&end=2020-12-31T00:00:00Z&latitude=-12.523704788457724&longitude=48.05416553298526&zoom=3.848739-42048194&dvin[0][id]=fishing-ais&dvin[0][cfg][vis]=false&dvin[1][id]=-0&dvin[1]


### 7 Annexes

#### 7.1 IMO’s Conventions and the WIO States

The following table summarizes the IMO’s conventions ratified or denounced by the WIO States.

**Table 7-1: Selected IMO Conventions Ratifications/ denunciations by WIO State**

<table>
<thead>
<tr>
<th>As at 26/10/2021</th>
<th>Comoros</th>
<th>Djibouti</th>
<th>Eritrea</th>
<th>Kenya</th>
<th>Madagascar</th>
<th>Mauritius</th>
<th>Mozambique</th>
<th>Seychelles</th>
<th>Somalia</th>
<th>Tanzania</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety at Sea</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOLAS Convention 74</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>SOLAS Protocol 78</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>SOLAS Protocol 88</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>SOLAS Agreement 96</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>COLREG Convention 72</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>STCW Convention 78</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>STCW-F Convention 95</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td><strong>Prevention - Mitigation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARPOL 73/78 (Annex I/II)</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>MARPOL 73/78 (Annex III)</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>MARPOL 73/78 (Annex IV)</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>MARPOL 73/78 (Annex V)</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>MARPOL Protocol 97 (Annex VI)</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Cape Town Agreement 2012</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>SAR Convention 79</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>SFV Protocol 93</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>London Convention 72</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>London Convention Protocol 96</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>ANTI FOULING 2001</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>BALLASTWATER 2004</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td><strong>Compensation - Liability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLC Convention 69</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>CLC Protocol 76</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>CLC Protocol 92</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>FUND Protocol 76</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>FUND Protocol 92</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>FUND Protocol 2003</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>BUNKERS CONVENTION 01</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>LLMC Convention 76</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>LLMC Protocol 96</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td><strong>Spill Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALVAGE Convention 89</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>OPRC Convention 90</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>HNS Convention 96</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>HNS PROT 2010</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>INTERVENTION Convention 69</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>INTERVENTION Protocol 73</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>OPRC/HNS 2000</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
</tbody>
</table>

**Source:** IMO, 2021

**Note:** ■ = ratification, ● = denunciation
7.2 Oil Spill Response Arrangements & Resources by WIO Country

As proven by the recent oil spill in Mauritius, when coping with their environmental problems WIO countries depend on the private sector’s contribution of its vast technical, managerial and financial resources, as well as its expertise. As such, the private sector is an important stakeholder in marine environment protection projects and plays a critical role through public-private partnerships (PPPs) as well as IMO’s Global Industry Alliance (GIA) and the IMO’s Global Initiative (GI). IMO’s innovative public-private partnerships contribution to the maritime sector is a model aims to help create ways to address marine environment issues, including new technologies, training, and capacity building activities. With the exception of IMO’s participation in implementing the Djibouti Code of Conduct\textsuperscript{194}, IMO’s GI projects in Africa have been essentially with Western, Southern (IMO-IPIECA GI and GI WACAF) and Central African countries.\textsuperscript{195} With its Regional Coordination Centre in Kenya, IMO has a presence in Eastern and Southern Africa.

Figure 7-1: Summary of Oil Spill Response Arrangements by WIO country

Sources: UNECA comparative analysis of the most recent ITOPF country profiles for: Djibouti, Eritrea, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, and Tanzania.

\textsuperscript{194} The project delivers technical assistance activities and capacity-building to counter piracy and armed robbery against ships in the Western Indian Ocean and Gulf of Aden

\textsuperscript{195} As of 2017 (IMO, 2017)
7.3 Fishing Intensity in the WIO region

Figure 7-2 below shows the level of fishing effort intensity in the WIO area in 2020 and identifies hot spots where observed fishing activity is most concentrated. This map demonstrates that there are some high-density fishing areas in bright yellow to pale yellow. The density scaling used on the map is to put into perspective the fishing hot spots in the WIO. Thirty-thousand fishing hours per year is the maximum recorded which corresponds to 82 vessel hours per calendar day or roughly 10 vessels fishing every day of the year on a 2000km$^2$ area, or 1 vessel per 200km$^2$ (~14km by 14 km area) fishing every single day of the year.

Figure 7-2: Apparent Fishing Effort between 1 January and 31 December 31, 2020

Source: AIS data from Global Fishing Watch (2021)