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Assessment of the status of Monitoring, Control, and Surveillance (MCS) Systems for Conservation and Protection of Aquatic Biodiversity in shared African Aquatic Ecosystems in the East and Southern (ESA) regions of Africa

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Executive Summary

This Technical Report assesses the status of Monitoring, Control and Surveillance (MCS) systems in shared aquatic ecosystems (marine and freshwater ecosystems) at national and regional levels in the East and Southern regions of Africa with the aim of strengthening regional cooperation on transboundary MCS systems in identified shared aquatic ecosystem to enhance conservation of aquatic biodiversity and environmental protection. The advent of Illegal, Unreported, and Unregulated (IUU) fishing has been widely recognized as a major challenge to the sustainable development and utilization of aquatic resources in the region. Therefore, this assignment focuses on the East and Southern African (ESA) regions of Africa.

List of Acronyms

ABES	Africa Blue Economy Strategy
ASCLME	Agulhas and Somali Current Large Marine Ecosystems
ALC	Automatic Location Communicator
AU	African Union
AU-IBAR	African Union – InterAfrican Bureau for Animal Resources
AUMS	African Union Maritime Strategy
BCC	Benguela Current Convention
CAADP	Comprehensive Africa Agriculture Development Programme
CAMFA	Conference of African Ministers of Fisheries and Aquaculture
CBD	Convention on Biological Diversity
CMS	Convention on the Conservation of Migratory Species
COM	Committee of Ministers
DAFF	Department of Agriculture, Forestry, and Fisheries
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assesment
ESA	Eastern and Southern African
EU	European Union
FACT	Fisheries Analytical Capacity Tank
FAD	Fish aggregating device
FAO	Food and Agriculture Organization
FANR	Director of Fisheries Aquaculture and Natural Resources
FFA	Forum Fisheries Agency
FMC	Fisheries Monitoring Centre
FPA	Fisheries Partnership Agreement
FPV	Fisheries Protection Vessel
GDP	Gross Domestic Product
IFM	Integrated fisheries monitoring
ILO	International Labour Organization
IMO	International Maritime Organization
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
IPMU	Interim Project Management Unit
IPOA	International Plan of Action
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported and Unregulated
IPOA-IUU	International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing
IRCS	International Telecommunication Union Radio Call Signs
ISSF	International Seafood Sustainability Foundation
JMSLMR	Joint Management of Shared Living Marine Resources

KMFRI	Kenya Marine and Fisheries Research Institute
LTA	Lake Tanganyika Authority
LOSC	United Nations Convention on the Law of the Sea
LVFO	Lake Victoria Fisheries Organization
MASE	Maritime Security
MCS	Monitoring, Control and Surveillance
MCSCC	Monitoring, Control and Surveillance Coordination Center
MPA	Marine Protected Areas
NEPAD	New Partnership for Africa's Development
NPCA	Nepad Planning and Coordinating Agency
NFDS	Nordenfjeldske Development Services
OECS	Organization of Eastern Caribbean States
OEBI	Offshore Energy and Biodiversity Initiative
PFRS	Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa
RAP	Regional Agricultural Policy
REC	Regional Economic Communities
RISDP	Regional Indicative Strategic Development Plan
RFB	Regional Fishery Body
RFMO	Regional Fisheries Management Organization
RISDP	Regional Indicative Strategic Development Plan
SADC	Southern African Development Community
SIF	Stop Illegal Fishing
SWIOFC	Southwest Indian Ocean Fisheries Commission
SWOT	Strengths, weaknesses, opportunities and threats
TAFIRI	Tanzania Fisheries Research Institute (TAFIRI)
TEP	Threatened, Endangered, and
TLFN	Traditional Leaders and Fishermen Network
UNEP	United Nations Environment Programme
VMS	Vessel Monitoring System
WIOCCA	Western Indian Ocean Coastal Carbon Assessment project
WWF	World Wildlife Fund for Nature

Section 1: Introduction

The rapidly growing global demand for seafood has increased pressure on aquatic ecosystems such as rivers, lakes, and oceans. Anthropogenic activities such as fishing activities and other industrial activities have led to pollution, climate change, and habitat destruction which subsequently have contributed to the decline in aquatic biodiversity across the globe. To tackle these challenges, countries have implemented conservation and protection measures, including MCS systems. MCS systems are essential in ensuring the sustainable management of aquatic resources by monitoring the status of aquatic life and enforcing regulations in the fishing industry.

Several international agreements and conventions require countries to implement MCS systems, notably the United Nations Convention on the Law of the Sea (UNCLOS), the Code of Conduct for Responsible Fisheries (FAO), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Convention on Biological Diversity (CBD), among others. Despite the existence of these agreements, shared aquatic ecosystems in the Southern and Eastern regions of Africa are under enormous pressure due to overfishing and pollution among other threats. Specifically, IUU fishing remains one of the greatest threats to aquatic ecosystems, undermining national and regional efforts to manage fisheries sustainably and conserve aquatic biodiversity. IUU fishing activities in Africa are major concerns with regards to sustainability of aquatic biodiversity that include unauthorized fishing in closed areas/ seasons, illegal fishing, fishing with forged and fraudulent licenses or vessel registrations, unreported and misreported catches, fishing Threatened, Endangered and Protected (TEP) species, dumping of toxic waters, ecosystems and environmental degradation, pollution etc. Africa's annual share of the global IUU fishing catch has recently been estimated at 4.7 million tons of fish at a conservatively estimated value of $10 billion's. Recent BBC documentary news stated that over 50 % of IUU fishing incidences take place in African Exclusive Economic Zones (EEZ). Weak governance is a major factor responsible of IUU fishing in African aquatic systems.

The ESA countries have economically important commercial fisheries which face serious threats. These countries have collaborated to establish the Africa Blue Economy Strategy (ABES), which was endorsed at the highest political level of the continent. The Strategy incorporates key critical vectors for promoting blue economy development, including fisheries, aquaculture, and ecosystem conservation, shipping, maritime safety, and trade, climate change, environmental sustainability, and ecotourism, sustainable energy and extractive mineral resources; governance, institutions, and job creation. The objective of the ABES is to guide the development of an inclusive and sustainable blue economy that becomes a significant contributor to continental transformation and growth, through advancing knowledge on marine and aquatic biotechnology, environmental sustainability, marine ecosystem utilization, management and conservation and carbon sequestration, the growth of an Africa-wide shipping industry, the development of sea, river and lake transport, the management of fishing activities on these aquatic spaces, and the exploitation and beneficiation of deep sea mineral and other marine resources. At present, the ESA countries' capacity to derive maximum benefits from the fishing sectors in their waters is considerably hindered by the pervasive levels of IUU fishing activities in the region.

1.1 Biodiversity conservation in African aquatic ecosystems

Aquatic biodiversity in shared aquatic ecosystems of East and Southern Africa (ESA) holds immense importance for both the environment and human communities. Aquatic biodiversity plays a crucial role in maintaining the health and resilience of shared aquatic ecosystems. Diverse species of fish, birds, mammals, and other organisms interact to form complex food webs, regulate nutrient cycles, and provide critical ecosystem services like water filtration, carbon sequestration, and climate regulation.

Many countries in the ESA region heavily rely on shared aquatic ecosystems for fisheries and food security. These ecosystems support vital commercial and artisanal fisheries, contributing to the livelihoods and income of millions of people. Aquatic biodiversity ensures the sustainability of fish stocks and supports the resilience of fisheries in the face of environmental changes.

Aquatic biodiversity offers significant socio-economic spin-offs beyond fisheries. Coastal tourism, recreational activities, and cultural traditions related to aquatic ecosystems contribute to local and national economies. Protecting and conserving aquatic biodiversity helps sustain these economic opportunities. The specific areas that highlight the importance of aquatic biodiversity are discussed below.

a. Fisheries and Livelihoods

The fishery resources within shared aquatic systems in the region support the livelihoods of millions of people. In Lake Victoria, for instance, over 200,000 direct and indirect jobs are created by the fishery sector, with fish providing a vital source of protein and income for local communities (WorldFish, 2019).

b. Tourism and Recreation

The rich biodiversity of shared aquatic systems, such as coral reefs, wetlands, and lakeshores, attracts tourists from around the world. Lake Malawi, known for its unique fish species and pristine waters, generates significant revenue from tourism activities, supporting local economies and livelihoods (Scholes, 2010).

c. Agriculture and Irrigation

Healthy aquatic ecosystems contribute to agricultural productivity and irrigation systems. The Nile River, for example, supports extensive irrigation schemes in countries such as Egypt and Sudan, providing water for crop production and enhancing food security (FAO, 2018).

d. Water Supply and Hydropower

Shared aquatic systems provide a critical source of freshwater for domestic, industrial, and agricultural use. Additionally, they support hydropower generation, contributing to regional energy production. The Zambezi River, with its multiple dams and hydroelectric projects, is a prime example of water resource utilization for energy production (Kling et al., 2014).

e. Resilience to Climate Change

Shared aquatic ecosystems act as natural buffers against the impacts of climate change on coastal communities. For example, mangrove forests, seagrass meadows, and coral reefs found in these ecosystems provide coastal protection, mitigate storm surges, and support the adaptation of adjacent communities to

climate-related events.

f. Unique and Endangered Species

ESA shared aquatic ecosystems are home to a rich diversity of unique and endemic species. Protecting these ecosystems is vital for the conservation of iconic species such as the African penguins, turtles, dugongs, and various marine mammal species. Many of these species are also threatened or endangered, making their preservation crucial for global biodiversity conservation.

g. Cultural and Traditional Values

The aquatic biodiversity in shared ecosystems holds deep cultural and traditional values for local communities. Indigenous cultures often have strong connections to these ecosystems and the species that inhabit them. Preservation of aquatic biodiversity helps maintain cultural heritage and traditional knowledge systems.

Recognizing the importance of aquatic biodiversity, countries in the ESA region have implemented various conservation and management measures, including the establishment of protected areas, sustainable fishing practices, and collaborations for transboundary management. However, continued collaborative efforts are needed to address persistent challenges, such as overfishing, habitat degradation, pollution, and climate change impacts, to ensure the long-term preservation of shared aquatic ecosystems and their biodiversity.

1.2 Project objectives

1.2.1 Objective 1

To ratify and align relevant international and regional instruments related to blue economy themes and the protection and conservation of biodiversity in shared aquatic ecosystems, ESA countries can take the following steps:

a. Identify and assess relevant international and regional instruments

Countries should identify the international and regional agreements, conventions, and protocols that address the protection and conservation of aquatic biodiversity and align with their blue economy strategies. This may include instruments such as the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species (CMS), and Ramsar Convention on Wetlands, among others.

b. Conduct gap analysis

Once the relevant instruments have been identified, countries should conduct a gap analysis to evaluate existing national legislation, policies, and frameworks against the requirements and obligations outlined in these instruments. This analysis will help determine the areas where alignment is needed.

c, Develop national policies and legislation

Based on the gap analysis, countries should develop or update national policies, strategies, and legislation that align with the relevant international and regional instruments. These policies and legislation should provide a legal framework for the protection and conservation of shared aquatic ecosystems and biodiversity,

considering aspects such as habitat conservation, sustainable fishing practices, pollution control, and climate change adaptation.

d. Strengthen institutional capacity

Countries should strengthen the capacity of their institutions responsible for implementing and enforcing the policies and legislation related to aquatic biodiversity conservation. This can include providing training and resources to relevant government departments, establishing partnerships with research institutions and NGOs, and conducting awareness campaigns to promote public understanding and participation in conservation efforts.

e. Promote regional cooperation

ESA countries should actively participate in regional forums and platforms dedicated to the blue economy and aquatic biodiversity conservation. Collaborative efforts can help harmonise policies, share best practices, and coordinate transboundary conservation initiatives. Regional organizations, such as the African Union (AU), Intergovernmental Authority on Development (IGAD), and South African Development Community (SADC), play a significant role in facilitating such cooperation.

f. Establish protected areas and sustainable management practices

Alongside policy development, countries should establish protected areas and implement sustainable management practices in shared aquatic ecosystems. This can include designating marine protected areas, implementing fisheries management plans, promoting integrated coastal zone management, and reducing pollution and habitat degradation through effective waste management practices.

g. Monitor and report progress

Regular monitoring and reporting of progress is essential to track the effectiveness of conservation measures and identify areas for improvement. Countries should establish mechanisms for monitoring aquatic biodiversity, collecting relevant data, and reporting on their progress towards meeting their commitments under the international and regional instruments.

By ratifying and aligning relevant international and regional instruments, ESA countries can strengthen their commitment to protecting and conserving biodiversity in shared aquatic ecosystems, contributing to the sustainable development of their blue economies.

1.2.2 Objective 2

Eastern and Southern African countries can optimize conservation and sustainable use of biodiversity in shared aquatic ecosystems while minimizing conflicts among different blue economy sub-themes by taking the following actions:

a. Implement effective governance and regulations

Governments should revise, establish and enforce robust regulations and standards to ensure sustainable practices in coastal and marine tourism, oil and gas activities, and deep-sea mining. This includes licensing and permitting processes, environmental impact assessments (EIA), and monitoring and enforcement

mechanisms.

b. Promote sustainable tourism practices

Encourage the adoption of sustainable tourism practices that minimize the ecological footprint, such as promoting responsible tourism guidelines, supporting community-based ecotourism initiatives, and implementing sustainable tourism certification programs.

c. Strengthen marine protected areas (MPAs)

Expand and effectively manage MPAs to conserve and protect important marine biodiversity hotspots. Clear guidelines to manage MPAs should also be put in place. MPAs can help mitigate the impacts of tourism, oil and gas activities, and climate change on aquatic ecosystems by providing sanctuary for marine species, protecting critical habitats, and ensuring sustainable resource use.

d. Enhance environmental monitoring and research

Invest in monitoring programs and scientific research to better understand the impacts of tourism, oil and gas activities, deep-sea mining, and climate change on aquatic biodiversity. This data will inform evidence-based decision-making, identify potential risks, and guide mitigation strategies.

e. Foster international collaboration

Collaborate with neighbouring countries, regional organizations, and international bodies to share knowledge, expertise, and best practices. Strengthening regional cooperation can facilitate coordinated efforts in managing shared aquatic ecosystems and addressing cross-border impacts.

f. Climate change adaptation and mitigation

Develop and implement climate change adaptation and mitigation strategies, such as promoting sustainable coastal and marine spatial planning, enhancing resilience of ecosystems and communities, and reducing greenhouse gas emissions.

g. Public awareness and education

Promote public awareness and education about the importance of aquatic biodiversity and the need for its protection. Engaging local communities, stakeholders, and tourists in conservation efforts can foster a sense of ownership and responsibility for maintaining the biodiversity and integrity of aquatic ecosystems.

By implementing these measures, countries in Eastern and Southern Africa can work towards minimizing the negative impacts of coastal and marine tourism, oil and gas activities, deep-sea mining, and climate change on aquatic biodiversity and the environment.

1.2.3 Objective 3

To strengthen measures for mitigating the negative impacts of coastal and marine tourism, oil and gas activities, deep-sea mining, and climate change on aquatic biodiversity and the environment in ESA, countries can take several actions:

a. Integrated Coastal Zone Management (ICZM)

Implementing ICZM approaches can help reconcile different blue economy sub-themes and balance competing demands for resources. ICZM promotes coordinated planning and management of coastal areas, taking into account ecological, social, and economic considerations. For example, the Mangroves and Seagrasses in Mozambique and South Africa project used an ICZM approach to promote sustainable livelihoods, conserve biodiversity, and enhance adaptive capacity in shared coastal areas.

b. Ecosystem-based fisheries management

Adopting ecosystem-based approaches to fisheries management, such as the implementation of Marine Protected Areas (MPAs) and sustainable fishing practices, can optimize fishery resources while conserving biodiversity. The management of the Benguela Current ecosystem by the Benguela Current Commission (BCC) is an example of a transboundary initiative that seeks to balance conservation with sustainable fisheries management.

c. Blue Carbon conservation

Protecting and restoring coastal ecosystems, such as mangroves, seagrasses, and salt marshes, can contribute to both carbon sequestration and biodiversity conservation. This approach, known as blue carbon conservation, can be integrated into the blue economy by recognizing and valuing the ecosystem services provided by these habitats. The Western Indian Ocean Coastal Carbon Assessment project (WIOCCA) is an example of a collaborative initiative that aims to assess and promote blue carbon conservation in the region.

d. Sustainable tourism and marine protected areas

Balancing tourism development with conservation objectives can be achieved through the establishment and effective management of Marine Protected Areas (MPAs). MPAs can protect sensitive habitats, regulate human activities, and promote sustainable tourism practices. The St. Lucia Marine Protected Area in South Africa is an example of an MPA that achieves a balance between conservation and tourism.

e. Renewable energy development

Promoting the development of renewable energy sources, such as offshore wind, tidal, and wave energy, can contribute to sustainable blue economy development while minimizing environmental impacts. The Offshore Energy and Biodiversity Initiative (OEBI) promotes best practices in offshore renewable energy development to ensure the protection of marine biodiversity. These actions require strong governance, collaboration, and integration of different sectors. They aim to optimize the use of aquatic resources while minimizing conflicts and achieving the principles of sustainable blue economy development.

1.2.4 Objective 4

To strengthen gender inclusivity in aquatic biodiversity conservation and environmental management in ESA countries, the following strategies can be employed:

a. Gender mainstreaming

Governments and relevant stakeholders should mainstream gender considerations into policies, programs,

and projects related to aquatic biodiversity conservation and environmental management. This involves analyzing the different impacts, needs, and roles of men and women in these sectors and ensuring that their voices and perspectives are integrated into decision-making processes.

b. Capacity building and training

Capacity building is the process of developing and strengthening the skills, knowledge, resources, and abilities of individuals, organizations and communities to sustainably address their own needs and priorities. Typically, this involves providing technical assistance, resources, and support to build the capacity of individuals and organizations to better fulfil their roles and achieve their goals. Capacity building is critical, as it helps to empower individuals and communities to become more self-reliant and resilient..

Enhancing the capacity and skills of women and men working in aquatic biodiversity conservation and environmental management is crucial for ensuring gender inclusivity. Training programs and workshops can be organized to provide both technical and leadership skills, focusing on the participation of women in traditionally male-dominated fields.

c. Promote women's leadership and representation

Efforts should be made to increase the representation of women in decision-making bodies, such as national committees and working groups focused on aquatic biodiversity conservation. Encouraging women's leadership and providing opportunities for their active participation can enhance gender inclusivity and provide diverse perspectives in decision-making processes.

d. Foster gender-sensitive research and data collection

Research and data collection should be gender-sensitive, considering the specific roles and contributions of both men and women in aquatic biodiversity conservation and environmental management. This can be achieved by conducting gender-disaggregated data collection and analysis, as well as involving women in research design and implementation.

e. Encourage women's participation in community-based conservation initiatives

Community-based conservation initiatives play a vital role in aquatic biodiversity conservation. Efforts should be made to actively involve women in these initiatives, ensuring their equal participation and decision-making power. Recognizing and supporting women's traditional knowledge and roles in natural resource management can contribute to more sustainable and inclusive conservation practices.

f. Increase access to resources and economic opportunities

Providing women with equal access to resources, such as financial capital, training, and technology, can help empower them in aquatic biodiversity conservation and environmental management. Enhancing women's economic opportunities in these sectors can also strengthen their participation and influence.

g. Awareness-raising and communication

Conducting awareness campaigns and communication initiatives can help challenge gender stereotypes and promote a more inclusive approach to aquatic biodiversity conservation and environmental management.

By highlighting the contributions of women in these sectors and showcasing their successes, gender inclusivity can be emphasized and encouraged.

h. Collaborative partnerships

Strengthening partnerships between governmental agencies, non-governmental organizations, and civil society groups can help foster gender inclusivity in aquatic biodiversity conservation and environmental management. Collaboration can lead to the pooling of resources, sharing of experiences, and joint initiatives that prioritize gender equality and inclusivity. By implementing these strategies, ESA countries can strengthen gender inclusivity in aquatic biodiversity conservation and environmental management, ensuring a more equitable and sustainable approach to protecting shared aquatic ecosystems.

Below the report demonstrate successful gender mainstreaming efforts in ESA countries, highlighting the importance of integrating gender considerations into aquatic biodiversity conservation and management initiatives.

i. Lake Victoria Fisheries Organization (LVFO)

The LVFO, which covers Kenya, Tanzania, and Uganda, has mainstreamed gender into their policies and programs. They have established a Gender Development Unit that ensures that the gender aspect is integrated into fisheries and aquatic biodiversity conservation initiatives. This includes promoting participation of women in decision-making processes, training women in sustainable fishing techniques, and supporting women's entrepreneurship in the fishing industry.

ii. Lake Tanganyika Authority (LTA)

LTA, operating in countries such as Burundi, Democratic Republic of Congo, Tanzania, and Zambia, has integrated gender considerations into their strategies and activities. They have established a gender unit within their organizational structure to address gender disparities in aquatic biodiversity conservation and management. This includes promoting women's participation in fisheries and aquaculture, providing training and economic opportunities for women in the sector, and advocating for gender-responsive policies and laws.

iii. Community-based conservation initiatives

Various community-based conservation initiatives in East and Southern Africa have successfully mainstreamed gender in their approaches. For instance, the Lake Chilwa Basin Climate Change Adaptation Program in Malawi involved capacitating women in sustainable resource management practices and encouraging their active involvement in decision-making at the community level. This has led to better stewardship of the lake and improved livelihoods for women.

iv. Mara River Basin

The Mara River Basin, shared between Kenya and Tanzania, has implemented gender-specific interventions through the Mara River Basin Management Committee. They conducted gender-disaggregated data collection and analysis, leading to the development of gender-responsive programs such as women-led water resource management groups and income-generating activities for women based on sustainable utilization of aquatic resources.

v. Marine Protected Area management

In countries like Mozambique and Madagascar, efforts have been made to mainstream gender in MPA management. This has included training and capacity-building programs that empower women as community leaders, ensuring their active participation in decision-making forums, and recognizing women's traditional knowledge in sustainable resource management.

Section 2: Study Approach and Methodology

2.1 Approach

Mr. Stanley Ndara and Dr. Victoria Erasmus, two independent fisheries consultants, conducted the consultancy for the SIDA funded project 'Conserving Aquatic biodiversity in Africa Blue Economy'. African Union – Interafrican Bureau for Animal Resources (AU-IBAR) issued the official notification designating the consultants as the successful project proposer on 22 May 2023. Following that, multiple correspondences were exchanged before the parties formally signed the contract. The purpose of this study is to assess the status of MCS systems in African shared aquatic ecosystems at national and regional levels in the ESA regions. The study sought to provide a baseline document of relevant information and knowledge in the ESA regions that will enable the implementation of the project to support existing or ongoing regional MCS initiatives in identified transboundary aquatic ecosystems.

Prior to the commencement of this project, an inception meeting was held virtually on 15 June 2023 and AU-IBAR subsequently received an inception report on 26 June 2023, which detailed the methodology for the project. The minutes of this meeting and the inception report are appended separately to this report. The report included a list of documents and material to be reviewed, a summary of media relevant to MCS and a list of focal persons. This information formed the basis of the desktop review. Subsequently, the lead consultant, Mr. Stanley Ndara undertook working visits to the SADC Monitoring, Control and Surveillance Coordination Center (SADC MCSCC) in Mozambique and the Indian Ocean Commission (IOC) in Mauritius, from 7-12 August 2023, to gauge the views and understanding of their operations and how AU-IBAR could collaborate with these regional centres.

To achieve the overarching aim of this project, the following objectives were outlined:

1. 1. Ratify and/or align relevant international/regional instruments related to the blue economy themes (with specific reference to protecting and conserving biodiversity).
2. Optimizing conservation and sustainable use of biodiversity while minimizing conflicts among blue economy sub-themes.
3. Strengthening measures for mitigating the negative impacts of coastal and marine tourism, oil, gas, deep sea mining and climate change on aquatic biodiversity and environment.
4. Strengthening gender inclusivity in aquatic biodiversity conservation and environmental management.

This Technical Report addresses technical gaps or requirements, and institutional challenges for providing support to institutional and technical capacity strengthening of ongoing regional MCS systems in shared ESA aquatic ecosystems for effective and sustainable establishment, functioning, or operationalization. In 2012, as part of the EU-funded SmartFish project's ongoing efforts, a thorough assessment of the MCS capacity in the ESA□IO region was carried out. The resultant report accentuated the current level of capacity, highlighted the identified gaps in capacity, and proposed specific measures to address the identified gaps.

In 2016, a separate research project was initiated to assess the state of Monitoring, Control, and Surveillance (MCS) systems in East Africa. In 2022, a comprehensive examination of MCS in Eastern and Southern

Africa and the Indian Ocean region was conducted, which also involved the creation of an MCS balanced scorecard (Bergh, 2012). While not encompassing the entirety of the ESA-region, the Bergh (2012) report presents significant information which form input to this current project. This report recognizes the different projects within the ESA region that focus on MCS in shared aquatic systems. Therefore, this study strongly supplements the various initiatives conducted on MCS to determine a pathway for institutional collaboration on MCS issues in the ESA regions and also forge synergies and collaboration with the newly established Monitoring, Control and Surveillance Coordination Centre (MCSCC) in Maputo, Mozambique.

The assessment provided in this Technical Report is based on a combined approach of desk research (literature review), responses from the survey conducted through electronic questionnaires, in-depth key informant interviews at member state and regional and international levels who were selected from the identified stakeholder list provided by the AU-IBAR. In a participatory approach, key agencies, practitioners, and authorities involved in MCS fishing activities and fisheries law enforcement were consulted for input to the zero draft which were adopted by incorporating comments from these stakeholders. This included an analysis of the capacity development and other requirements; determination of cost structure, schedule, and performance constraints; determination of what can be met and what cannot be met; development of options/approaches for items that cannot be met; and presentation of the plan to stakeholders.

In this Technical Report, the evaluation of current transboundary measures for managing shared aquatic ecosystems in ESA at national and regional levels relies primarily on easily accessible information from literature and the feedback received from ESA member states. In accordance with the 2014 African Union's Policy Framework and Reform Strategy for Fisheries and Aquaculture (PFRSFA), the high degree of interconnectedness of the African continent requires strengthened regional cooperation, collaboration, and coordination in the management of shared ecosystems. This is particularly relevant to combat IUU fishing at a regional and sub-regional level. The Statement aims to improve regional cooperation to eradicate IUU fishing; strengthen fisheries governance and legal frameworks to eliminate IUU fishing; develop regional plan of action to combat IUU fishing and strengthen fisheries MCS capacity regionally.

2.2 Project outline

This Technical Report is divided into five sections. Section one (1) presents the background information on the importance of aquatic biodiversity conservation in African aquatic ecosystems including the economic benefits of aquatic biodiversity conservation in African aquatic ecosystem. This section also covers the international legal obligations relating to MCS, as outlined in various mandatory and voluntary agreements.

Section two (2) provides the project approach and methodology, outline the MCS concept including components and tools of MCS in their various spheres. It also contains a summary of existing studies on MCS in ESA.

Section three (3) unpacks the project objectives by proposing appropriate action steps. It further provides an overview of existing MCS systems in shared ESA aquatic ecosystems. Additionally, this section seeks to strengthen measures for mitigating the negative impacts of coastal and marine tourism, oil and gas activities, deep-sea mining, and climate change. An evaluation of the adequacy and effectiveness of these

systems is also provided.

Section four (4) analyses the current regional capacity in implementing an MCS framework in East Africa. Section 4 of the Technical Report examines state practice in adopting specific MCS measures such as vessel registration and licensing, observer program, vessel monitoring system, port State measures and catch certification.

Section five (5) concludes with a summary of key findings and provides recommendations towards a sub-regional MCSCC to address IUU fishing.

2.3 Concept of MCS

Monitoring, Control, and Surveillance (MCS) involves the collection, analysis, and management of data and information on the activities of vessels, aircraft, and people involved in fishing and related activities to ensure compliance with laws and regulations and to support effective fisheries management (FAO, 2005). The definition of Monitoring, Control and Surveillance (MCS) of fisheries as agreed upon during the FAO Technical Consultation in 1981 is considered ideal because it recognizes the need for a diverse range of individuals to carry out MCS activities. This definition acknowledges that MCS experts are not limited to fisheries law enforcement alone but may include individuals who have extensive knowledge and experience in sustainable fisheries management, data analysis, surveillance technologies, enforcement strategies, international fisheries regulations, and marine resource conservation. This can include government officials, marine biologists, fishery scientists, environmental researchers, law enforcement officers, and policy experts who specialize in fisheries management and enforcement. Additionally, individuals who have received specialized training in fisheries MCS may also be considered experts in this field. By incorporating a variety of expertise, the MCS framework can better address the multifaceted challenges of monitoring and controlling fisheries activities, ultimately leading to more effective and comprehensive management strategies.

Monitoring entails gathering, measuring, and analyzing data on various aspects of fishing activity, such as catch, species composition, effort, discards, and area of operations. This information is used by fishery managers to make decisions about managing the fishery. Specific aspects of monitoring include tracking fish landings and effort, collecting biological samples, conducting research vessel and trawl surveys, assessing stock abundance, tagging fish, and monitoring mortality from diseases and parasites.

Control involves establishing the terms and conditions for harvesting resources, typically through national laws and regulations, and serves as the basis for enforcing management measures.
Surveillance entails overseeing and inspecting fishing activity to ensure compliance with national laws, access agreements, and management measures. This is essential for preventing overexploitation, minimizing poaching, and ensuring effective management of the fishery.

The advent of IUU fishing has been widely recognized as deterrent to the sustainable development and utilization of the fisheries resources in the region. Target 14.4 of the worldwide Sustainable Development Goals (SDGs) aims to put an end to IUU fishing, showcasing its worldwide significance. Furthermore,

tackling IUU fishing will also have a positive impact on the SDGs associated with poverty reduction, eliminating hunger, promoting fair employment opportunities, promoting responsible consumption and production, and encouraging collaboration and partnerships.

An effective MCS system has the potential to preventing, deterring, and eliminating IUU fishing and thus recognized as one of the key principles of fisheries management both in areas under national jurisdiction and the high seas. The three components of MCS suggest that it is not limited to policing or fisheries enforcement but involves a range of measures that considers a legal framework, data collection and analysis, and surveillance and patrol systems that would help ensure compliance in fisheries. MCS also comprises land, sea, and air aspects that enable an operational implementation of the system.

The rich diversity of the ESA region`s marine resources and environment calls for an effective conservation and management regime implemented by a robust MCS system. Fishing is one of the main large-scale commercial activities in the region which contributes to achieving food security, poverty alleviation, and economic development. Increased pressure on resources, driven by a number of factors such as population increase, industrialization, overcapacity, IUU fishing, and weak enforcement has become a significant threat to the ecological sustainability of the region's marine, coastal, and inland fishing areas. IUU fishing activities have negative economic, environmental, ecological, and social impacts and need to be addressed at both national and regional levels. Recent studies also suggest that there may be incidents involving organized criminal groups in illegal fishing activities, which further call for wider cooperation beyond the scope of national fisheries institutions and regional fisheries management organizations (RFMOs).

The implementation of MCS to combat IUU fishing has its legal basis in international binding and non-binding instruments such as the United Nations Convention on the Law of the Sea (UNCLOS), UN African Union - Inter-African Bureau for Animal Resources (AU-IBAR), Fish Stocks Agreement, FAO Compliance Agreement, the FAO Code of Conduct for Responsible Fisheries and the four International Plans of Action, including the International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported an Unregulated Fishing (IPOA-IUU), and the FAO Port State Measures Agreement. These instruments provide for the adoption of a number of MCS measures from the commencement of the fishing activity to the final destination of caught fish. These measures include vessel registration, licensing or authorization to fish, record of fishing vessels, vessel monitoring system, observer programs, boarding and inspection regimes, port state measures, and catch certification.

IUU fishing is considered a significant problem due to its detrimental impacts on marine ecosystems, fisheries sustainability, and fishing communities. IUU fishing is a major continental concern, with various negative impacts including:

a. Overfishing and Depletion of Fish Stocks

IUU fishing often involves the excessive and unregulated harvest of fish stocks, leading to overfishing and depletion. This threatens the balance of marine ecosystems, disrupts food chains, and undermines the sustainability of fisheries resources.

b. Threat to Biodiversity

IUU fishing practices often disregard regulations designed to protect vulnerable species and habitats. This puts marine biodiversity at risk, as non-target species, including endangered or protected ones, can be caught or harmed in the process.

c. Economic Impact

IUU fishing undermines the economic viability of legitimate fishing operations. It distorts market competition, devalues seafood prices, reduce government income (through levies and taxes) and reduces the incomes of law-abiding fishers and fishing-related enterprises. According to the AU-IBAR report of 2019, the IUU fishing problem was conservatively estimated to have cost Africa $10 billion in catch value annually (AU-IBAR, 2019). Fishing communities that dependent on fishing for livelihood suffer economic losses and reduced livelihood opportunities.

d. Food insecurity and Poverty

IUU fishing deprives coastal communities, often in developing countries, of vital food and nutritional resources. It impairs local fishing industries, disrupts supply chains, and exacerbates food insecurity and poverty in these areas.

e. Environmental Damage

IUU fishing practices may involve destructive methods, such as using illegal gear or fishing in protected areas. These activities can cause habitat destruction, coral reef damage, and harm to sensitive marine ecosystems.

f. Undermining Fisheries Management

IUU fishing undermines efforts to implement effective fisheries management measures. It evades, undermines, and weakens regulations, making it challenging to accurately assess fish stocks, enforce quotas, and implement sustainable fishing practices.

Addressing IUU fishing requires national (intra-agencies), regional and international cooperation, better enforcement, improved monitoring and surveillance, and effective management measures that promote responsible fishing practices. By combating IUU fishing, the ESA region can contribute to the long-term health of oceans and support sustainable livelihoods for fishing communities around the world.

Section 3: Current State of Monitoring, Control, and Surveillance (MCS) Systems

3.1 Overview of existing MCS systems in shared African aquatic ecosystems

Here are some examples of transboundary MCS initiatives in the Eastern and Southern African region:

a. Benguela Current Convention (BCC)

BCC is a regional organization that promotes cooperation among Angola, Namibia, and South Africa to manage and conserve the Benguela Current ecosystem. It focuses on sustainable fisheries management, protection of marine biodiversity, and mitigating the impacts of climate change.

b. Western Indian Ocean Marine Science Association (WIOMSA)

WIOMSA is a regional organization that brings together countries in the Western Indian Ocean region, including those from Eastern and Southern Africa. It promotes research, capacity-building, and collaboration in marine science to support sustainable management of the marine and coastal environment.

c. Agulhas and Somali Current Large Marine Ecosystems (ASCLME) Project

ASCLME is a project that aims to ensure sustainable management of the Agulhas and Somali Current Large Marine Ecosystems, which span South Africa, Mozambique, Tanzania, and Kenya. It focuses on strengthening governance, improving research, and monitoring, and enhancing ecosystem-based management.

d. Joint Management of Shared Living Marine Resources (JMSLMR)

JMSLMR is an initiative that promotes cooperation between Mozambique and South Africa for the management and conservation of shared living marine resources. It includes joint research, monitoring, law enforcement, and resource sharing to ensure sustainable fishery practices.

e. Eastern Africa Regional Action Plan on Marine Litter (EARAP-MaLi)

EARAP-MaLi is a regional plan developed by the United Nations Environment Programme (UNEP) in collaboration with countries in Eastern Africa. It aims to tackle marine litter and plastic pollution by promoting effective waste management, awareness campaigns, and sustainable practices.

Although all countries in the ESA regions may not necessarily have the capacity to carry out research on their own, there are several examples of scientific research in aquatic biodiversity in the Eastern and Southern African regions, including Namibia and South Africa. For example, in Namibia, the Namibian Marine Phosphate (Pty) Ltd. conducted a baseline survey of the benthic biodiversity in the Sandpiper Project Area, which was a collaborative effort with international agencies such as the Dr. Fritjof Nansen.

In South Africa, the Department of Agriculture, Forestry, and Fisheries (DAFF) has collaborated with the International Union for Conservation of Nature (IUCN) to conduct research on the biodiversity of the coastal and marine environment. They have also collaborated with the Dr. Fritjof Nansen to conduct surveys of fish and benthic communities in the Benguela Current Ecosystem.

Other countries in the Eastern and Southern African region, such as Mozambique, Tanzania, and Kenya, also collaborate with international agencies for scientific research in aquatic biodiversity. For example, the Mozambican Institute of Fisheries Research (IIP) collaborates with the Food and Agriculture Organization of the United Nations (FAO) to conduct research on the biodiversity of the Mozambique Channel. Similarly, the Tanzania Fisheries Research Institute (TAFIRI) collaborates with the Dr. Fritjof Nansen to conduct surveys of fish stocks in the Indian Ocean. In Kenya, the Kenya Marine and Fisheries Research Institute (KMFRI) collaborates with the United Nations Environment Programme (UNEP) to conduct research on the biodiversity of marine and coastal ecosystems. The report has also outlined the collection of independent scientific data by Namibian fisheries observers.

These examples demonstrate the efforts of countries in ESA to collaborate and independently address transboundary marine and coastal management issues through various regional initiatives and organizations.

3.2 Evaluation of the adequacy and effectiveness of these systems

Assessing the effectiveness of Monitoring, Control and Surveillance systems (MCS) in shared African aquatic systems requires considering various factors, including governance frameworks, stakeholder involvement, enforcement mechanisms, and ecological outcomes. While effectiveness can vary across different regions and countries, here is an overview of some key elements:

a. Governance Frameworks

The presence of clear and comprehensive policies, laws, and regulations for MCS management is crucial. Effective governance frameworks ensure coordination between different stakeholders, including local communities, government agencies, NGOs, and international organizations. The establishment of appropriate institutional structures and the inclusion of local communities in decision-making processes can enhance the effectiveness of MCS systems.

b. Stakeholder Involvement

The involvement and engagement of local communities in the planning and implementation of MCS management strategies are crucial. Meaningful engagement and empowerment of local communities can lead to increased compliance, better enforcement, and sustainable use of aquatic biodiversity resources. mEfforts should be made to ensure the participation of marginalized groups, such as women and indigenous communities.

c. Enforcement and Compliance

Effective enforcement mechanisms are essential to deter illegal and unsustainable practices. Adequate resources, such as personnel, equipment, and funding, must be allocated to enforce regulations. Collaboration between law enforcement agencies, government agencies, local communities, and NGOs is important to ensure active surveillance and monitoring of aquatic ecosystems.

d. Ecological Outcomes

The ecological health of shared aquatic systems, such as the presence of diverse species, conservation of critical habitats, and restoration efforts, indicates the effectiveness of MCS systems. Monitoring programs

can assess the status of aquatic biodiversity, track changes over time, and inform adaptive management strategies. Effective MCS systems should aim to maintain or restore the resilience and functionality of ecosystems.

e. Cooperation and Collaboration

Transboundary cooperation and collaboration between countries sharing aquatic systems are vital for effective MCS management. Shared governance frameworks, joint management plans, and agreements can facilitate the sustainable use and conservation of aquatic biodiversity resources. Regional organisations and international agreements, such as the African Union Maritime Strategy (AUMS) and the Nairobi Convention, help foster collaboration and coordination among countries.

It is important to note that the effectiveness of MCS systems in shared African aquatic systems is influenced by various challenges, including limited resources, inadequate capacity, social and economic pressures, climate change impacts, and conflicting interests among stakeholders. However, continued efforts to improve governance frameworks, enhance stakeholder involvement, enforce regulations, and achieve ecological outcomes are crucial for the long-term success of MCS management in these regions.

f. Regional Fisheries Observer Programs

The main aim of fisheries observer programs is to observer fishing activities and to collect data during fishing activities. Fisheries observers play a crucial role due to the importance of fisheries resources in the ESA countries. Some of the key functions of the Interim Project Management Unit (IPMU) are to coordinate implementation of the regional fisheries observers and fishing vessel programs, in an effort to strengthen national MCS systems.

AU-IBAR has been supporting SADC in the processes to establish the MCSCC, and one of the activities carried out in 2016 was to establish the Status of fisheries observer programs in Southern Africa and develop a framework for a sea-based regional fisheries observer programme for the SADC region. The Fisheries Governance Project (FishGov), conducted a workshop from 7 – 9 February 2018 in Mombasa, Kenya. This workshop was conducted by the AU-IBAR in partnership with the NEPAD Planning and Coordinating Agency (NPCA), and with funding from the European Union (EU). This event was organized as a component of the broader Continental project that SADC is a member of, which aims to enhance governance of the fisheries sector in Africa by strengthening institutional capacity. These types of capacity building interventions are encouraged to up-skill fisheries observers with the necessary knowledge in the ESA region.

This study embarked upon a gap analysis of fisheries observer programs in the ESA countries and the importance of uniformity to enrich the aspect of MCS assessment. The following gaps were identified in the ESA countries.

- Inconsistent presence and coverage of fisheries observers across countries.
- Lack of standardized training and certification for fisheries observers.
- Insufficient capacity and resources for effective implementation.

- Limited sharing and integration of observer data among countries.

From the fisheries observer programs studied (also see section 3.2 (f) of this report) in the ESA region, it is recommended that the region considers the adoption of the mixed model of the Fisheries Observer Agency (FOA) of Namibia, which combines scientific data collection and compliance monitoring and reporting, for the following reasons:

- Fisheries observers provide direct, on-site data collection, ensuring accurate and reliable information on fish stocks, catch rates, biodiversity, and ecosystem health. This data is vital for effective fisheries management, assessment of stock status, and making informed decisions regarding sustainable fishing practices.
- Fisheries observers monitor fishing activities to ensure compliance with fishing regulations, including proper documentation, adherence to quotas, and compliance with bycatch and discard regulations. By reporting any violations, they contribute to the enforcement of rules and promote responsible fishing practices.
- Through their presence on fishing vessels, fisheries observers contribute to the detection and prevention of IUU fishing practices. By monitoring and reporting such activities, they help protect the marine environment, prevent overfishing, and promote the sustainable use of fisheries resources.

3.3 Overview of emerging technologies to enhance aquatic biodiversity MCS systems in shared aquatic ecosystems

Emerging technologies have the potential to greatly enhance aquatic biodiversity monitoring, control, and surveillance systems in the shared African aquatic ecosystems of the East and Southern regions. Here are some of the key technologies that can be utilized:

a. Remote Sensing

Remote sensing technologies, such as satellite imagery and aerial drones, can provide valuable data on aquatic ecosystems. They can be used to monitor changes in water quality, detect illegal fishing activities, and identify areas of habitat degradation or encroachment.

b. Geospatial Analysis

Geospatial analysis tools, such as Geographic Information Systems (GIS), can help integrate data from various sources to create comprehensive maps and spatial models. This allows for better understanding of the distribution of aquatic species, and patterns of illegal fishing, and identifies high-risk areas that require targeted monitoring and enforcement efforts.

c. Electronic Monitoring Systems (EMS)

EMS, including onboard cameras and sensors, can be deployed on fishing vessels to capture real-time data on fishing activities. These systems can document catch composition, and fishing effort, and help identify potential cases of illegal or unreported fishing.

d. Acoustic Monitoring

Acoustic technologies, such as hydrophones and sonar, can be used to monitor underwater soundscapes

and detect the presence of specific species. This enables better tracking of migratory patterns, breeding grounds, and illegal fishing activities.

e. DNA-based Techniques

DNA-based techniques, such as environmental DNA (eDNA) sampling and genetic analysis, can provide valuable insights into the presence and abundance of aquatic species. eDNA sampling can detect the genetic material that organisms shed into their environment, allowing for non-invasive monitoring and identification of species in shared aquatic ecosystems.

f. Artificial Intelligence

Artificial intelligence algorithms can analyze large datasets and patterns, helping to automate monitoring and surveillance efforts. AI can identify and classify aquatic species, detect illegal fishing behaviours, and identify anomalies in data to support early warning systems. Artificial intelligence can be used to achieve the following:

i. **Object Detection**: Object detection algorithms, such as the popular Convolutional Neural Networks (CNNs), can be trained to identify and classify objects in aquatic environments. For example, they can be used to detect and track fishing vessels or to identify specific marine species from video or image data.

ii. **Anomaly Detection**: AI algorithms can be employed to identify anomalies in data that may indicate illegal fishing activities or other abnormal behaviour. These algorithms can analyze patterns and identify deviations from expected or normal behaviour, raising red flags for further investigation.

iii. **Image Recognition:** AI algorithms, such as deep learning models, can be trained on large datasets of aquatic species images to accurately recognize and classify different species. These algorithms can be used to monitor species diversity and identify endangered or protected species.

iv. **Data Fusion:** AI algorithms can integrate data from multiple sources, such as satellite imagery, acoustic sensors, and vessel tracking systems, to provide a comprehensive view of the aquatic environment. By fusing data from different sensors, these algorithms help in identifying patterns and correlations that can support surveillance efforts.

v. **Predictive Analytics:** AI algorithms can analyze historical data on fishing activities, environmental factors, and other relevant variables to make predictions about future illegal fishing incidents or trends. This helps prioritize surveillance efforts and allocate resources effectively.

vi. **Natural Language Processing:** techniques can be used to analyze and extract information from textual data, such as fishing vessel logbooks, social media feeds, or online forums. This helps identify discussions or information related to illegal fishing activities and provides valuable insights for surveillance and enforcement agencies.

vii. **Data Integration and Sharing Platforms:** A robust data integration and sharing platform can allow for the centralized collection, management, and sharing of data from various sources. This enables better collaboration between countries and organizations, facilitates data-driven decision-making, and improves the effectiveness of monitoring and enforcement efforts.

These are just a few examples of how artificial intelligence can be utilized in aquatic surveillance. It is important to note that the effectiveness of these algorithms relies on the availability of high-quality training data and continuous refinement to improve accuracy and performance. By embracing these emerging technologies, the ESA countries can enhance their capacity for aquatic biodiversity monitoring, control, and surveillance. These technologies can improve the understanding of aquatic ecosystems, aid in the detection and prevention of illegal activities, and support sustainable management and conservation of shared aquatic resources.

However, countries in the ESA region must take ownership of these artificial intelligence systems to prevent manipulation and data breaches by external service providers.

3.4 Analysis of the involvement and roles of local communities, government agencies, NGOs, and international organizations in MCS systems

Involvement and roles of different stakeholders in the management of marine and coastal systems (MCS) with shared aquatic biodiversity ecosystems in eastern and southern African countries can vary. However, here are some common themes in the involvement and roles of local communities, government agencies, NGOs, and international organizations:

3.4.1 Local Communities

- Local communities living along the coastline or dependent on marine resources often play a crucial role in MCS management.
- They have traditional knowledge and practices that contribute to the sustainable use of aquatic biodiversity.
- Local communities engage in activities such as fishing, aquaculture, and eco-tourism, and their involvement is critical in decision-making and implementation of MCS management plans.
- In many cases, they form organized groups or community-based organizations that collaborate with relevant stakeholders in co-management efforts.

3.4.2 Government Agencies

- Governments in ESA countries have the responsibility of developing and implementing policies and regulations for MCS management.
- They establish national marine and coastal departments or agencies, which are often under the Ministry of Environment or Agriculture, to oversee management plans and enforce regulations.
- Government agencies conduct research, surveillance, and monitoring programs to assess the health of aquatic biodiversity and ecosystems.
- They engage in stakeholder consultations, participate in regional and international forums, and negotiate agreements related to the sustainable management of shared aquatic biodiversity resources.

3.4.3 Non-Governmental Organizations (NGOs)

- NGOs often complement government efforts by providing technical expertise, capacity building, and community mobilization.
- They partner with local communities, government agencies, and international organizations to implement MCS management projects.
- NGOs also contribute to advocacy and policy development, working towards the sustainable use and conservation of marine and coastal resources.
- They often focus on education, awareness-raising, and the empowerment of local communities, especially marginalized groups, to ensure their inclusion in decision-making processes.

3.4.4 International Organizations

- International organizations, such as the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), and International Union for Conservation of Nature (IUCN), support MCS management initiatives.
- The International Monitoring, Control and Surveillance Network (IMCS Network) is a global initiative aimed at combating illegal, unreported and unregulated (IUU) fishing activities. The network brings together national, regional and international organizations, as well as governments and relevant stakeholders, with the goal of coordinating efforts to monitor, control and enforce regulations on fishing activities. The network also works to share information, best practices and resources to improve surveillance and enforcement efforts in the world's oceans. By addressing IUU fishing, the IMCS Network aims to promote sustainable and responsible fishing practices, protect marine resources and support the livelihoods of legitimate fishers.
- These organizations provide technical, financial, and logistical support to governments, NGOs, and local communities.
- They facilitate knowledge exchange, capacity building, and the adoption of best practices in MCS management.
- International organizations also play a vital role in promoting regional collaboration, transboundary conservation, and the negotiation of international agreements that benefit shared aquatic biodiversity ecosystems.

Overall, the involvement and roles of local communities, government agencies, NGOs, and international organizations in MCS systems aim to ensure sustainable use, conservation, and equitable benefits from shared aquatic biodiversity ecosystems in eastern and southern African countries.

3.5 Analysis of successful MCS initiatives or projects in the East and Southern African aquatic ecosystems

There have been several successful initiatives and projects in the shared ESA aquatic ecosystems that focus on Monitoring, Control, and Surveillance (MCS) to safeguard aquatic biodiversity and combat illegal activities. Here is an analysis of some notable examples:

- **FishFORCE:** The FishFORCE Academy is hosted at the Nelson Mandela University in Port Elizabeth and is a regional initiative led by the Food and Agriculture Organization (FAO) and supported by the

Norwegian Agency for Development Cooperation (Norad). It aims to enhance MCS capacities in the ESA countries. FishFORCE provides training and technical support to fisheries enforcement agencies, promotes cooperation between countries, and utilizes technology and intelligence-sharing platforms to combat illegal fishing. This initiative has helped strengthen MCS efforts in the region.

- **Regional Fisheries Monitoring, Control, and Surveillance Center (REMOC)**: REMOC is an initiative by the Indian Ocean Tuna Commission (IOTC) and Western Indian Ocean Marine Science Association (WIOMSA) that focuses on MCS in the Western Indian Ocean. REMOC supports regional collaboration and information exchange, conducts training programs, and develops innovative tools for MCS activities. The center has improved the collective capacity of countries in the region to monitor and control illegal fishing.

- **The SMART Approach:** The Spatial Monitoring and Reporting Tool (SMART) is an innovative approach that integrates technology, data, and trained personnel to enhance MCS efforts. SMART has been successfully implemented in several ESA countries, such as Mozambique, Tanzania, and Kenya. It enables real-time data collection, analysis, and decision-making, improving surveillance, and enforcement efficiency.

- **Integrated Coastal Surveillance Systems:** Some coastal countries in East and Southern Africa have implemented integrated coastal surveillance systems to enhance MCS capacities. For instance, Kenya has established the Kenya Maritime Surveillance System (KMSS), which combines radar, AIS (Automatic Identification System), and other technologies to monitor vessel movements, detect illegal activities, and facilitate targeted law enforcement interventions.

- **Community-Based Surveillance:** Engaging local communities in MCS efforts has proven effective in some East and Southern African countries. For instance, the Traditional Leaders and Fishermen Network (TLFN) in Lake Malawi works closely with local communities to monitor and report illegal fishing practices, creating a sense of co-responsibility for safeguarding aquatic biodiversity.

These initiatives have demonstrated the importance of regional collaboration, capacity building, technology integration, and community involvement in successful MCS efforts. They emphasize the need for sustained support, investment, and coordination among countries to address challenges such as illegal fishing, habitat degradation, and unsustainable practices in shared aquatic ecosystems.

3.6 Examination of lessons learned and best practices from Centres of Excellence in ESA region

- **Research and Data Collection**

Centres of Excellence conduct research on aquatic biodiversity and ecosystems, including the assessment of fish stocks, the study of marine and freshwater habitats, and the monitoring of threatened species. This research generates valuable data and information that can be used to inform MCS systems, including the identification of key species, understanding their migration patterns, and assessing the health of ecosystems.

- **Capacity Building**

Centres of excellence play a crucial role in building the capacity of regulatory authorities, managers, and enforcement agencies responsible for MCS in the shared aquatic biodiversity ecosystems. They offer training programs, technical workshops, and certification courses that enhance the knowledge and skills of personnel in areas such as data analysis, species identification, ecosystem monitoring, and enforcement techniques. This capacity building ensures more effective and informed MCS efforts.

- **Technology and Tools**

Centres of Excellence work on the development and adaptation of technology and tools for effective MCS. They explore innovative solutions, including remote sensing technology, satellite-based monitoring, acoustic tracking systems, and DNA identification techniques, which can aid in the monitoring and control of activities in shared aquatic biodiversity ecosystems. These advanced tools help in detecting illegal fishing activities, tracking vessel movements, and improving the accuracy and efficiency of MCS systems.

- **Policy Support**

Centres of Excellence provide scientific expertise and advice to policymakers and regulatory bodies involved in the development and implementation of MCS frameworks. Through their research findings and assessments, they contribute to the creation of evidence-based policies, regulations, and guidelines that promote sustainable fisheries management and conservation of shared aquatic biodiversity ecosystems. They help in identifying gaps, recommending best practices, and supporting the alignment of national and regional policies.

- **Regional Collaboration**

Centres of Excellence foster collaboration and networking among stakeholders involved in MCS of shared aquatic biodiversity ecosystems. They facilitate the exchange of information, experiences, and best practices among countries in the region. By organizing workshops, conferences, and forums, they promote dialogue, encourage cooperation, and support the development of joint MCS initiatives. This collaboration enhances the effectiveness of monitoring and control efforts, particularly in areas where ecosystems and fish stocks transgress national boundaries.

- **Awareness and Stakeholder Engagement**

Centres of Excellence engage with local communities, fishing associations, and other stakeholders to raise awareness about the importance of sustainable fisheries and the need for effective MCS. They conduct outreach programs, public education campaigns, and participatory workshops to empower communities, promote responsible fishing practices, and encourage reporting of illegal activities. Such engagement helps in building a sense of ownership and cooperation, which is crucial for the success of MCS systems in shared aquatic biodiversity ecosystems.

By leveraging their research expertise, capacity-building initiatives, policy support, and collaboration efforts, centers of excellence contribute to the development and strengthening of MCS systems in shared aquatic biodiversity ecosystems in Eastern and Southern Africa. Their contributions help ensure the sustainable management of fisheries, the conservation of biodiversity, and the protection of the livelihoods and food

security of communities dependent on these ecosystems.

3.7 Overview of Regional VMS in the ESA region

One of the priority services of the envisaged SADC MCSCC would be the provision of a Regional VMS to the State Parties. This aligns with the objectives and function of the centre, namely *Article 7 (2)* of the Charter that establishes the SADC MCSCC which requires the establishment and maintaining of a regionally harmonised fishing vessel Monitoring system. Ineffective MCS systems have contributed to increased incidences of unsustainable practices and reduction in aquatic biodiversity in African large marine ecosystems and inland waters. In most cases the current transboundary MCS systems are weak, the initiatives are unsustainable, and require institutional strengthening and capacity development.

There is a therefore a need to conduct assessment of MCS systems to identify national and regional priorities and capacities towards collaborating and supporting on ongoing existing or ongoing initiatives through the setting up of a comprehensive regional MCSCC. VMS continue to be an integral part of monitoring control and surveillance programs at national and international levels. VMS is a satellite-based system used in commercial fishing to allow environmental and fisheries regulatory organizations to track and monitor the activities of fishing vessels through Automatic Location Communicators (ALCs). The Indian Ocean (IO) has made several strides at implementing various Regional VMS programs with each program at various stages. Understanding the various programs, progress made, objectives and bottlenecks in the SADC region would provide a helicopter view for the BCC region and subsequently the envisaged MCSCC once established.

3.7.1 Indian Ocean Tuna Commission

The Indian Ocean Tuna Commission (IOTC) established a VMS Steering group in 2017, which was superseded by a VMS Working group in 2019 to oversee the implementation of a regional VMS for the commission. The main objective of the steering group and the working group was to assess the effectiveness of the current regime for the IOTC VMS conservation and management measure[1], provide recommendation to the commission of the with the penultimate goal of strengthening the IOTC VMS. As of 2019, the working group has been defining the objectives of the regional system, agree on the modality to share VMS data between CPCs and the proposed Regional VMS Centre, the modality for managing the VMS data and the revision and amendment of the VMS Resolution, including data security rules. However, the IOTC is yet to adopt a Resolution to implement a regional IOTC VMS.

To date, the group has agreed to;

- Propose a hybrid approach to sharing of VMS data, either directly from the vessel (Partially Centralized) or from the flag state (Shared Decentralized)
- Propose that the management of VMS data, and active monitoring of fishing vessel is done by the CCPs, with the secretariats role to monitor compliance with the VMS resolution, and provide technical support to the VMS system, with future plans to have a fully operational Fisheries Monitoring Centre (FMC) in the future.

[1] *Resolution 15/03 On the Vessel Monitoring System (VMS) Programme*

- Continue discussions to update the current VMS Resolution to align it with proposed modalities and objectives.
- Consideration for necessary data security and management, and confidentiality rules.
- Consideration for collaboration with other RFMOs/ MCS Initiatives

The current VMS Resolution provides for a completely decentralized VMS, whereby each CPCs are required to implement a national VMS programme, with no provisions for the sharing of VMS data under any circumstances.

3.7.2 Southern Indian Ocean Fisheries Agreement

In 2019, the Southern Indian Ocean Fisheries Agreement (SIOFA) considered a CMM for a Regional SFIOA VMS. The Meeting of Parties (MoP) could not reach consensus to adopt the VMS CMM in view that there was no agreement on the modality for the sharing of VMS data, which proposed a rigid shared decentralised approach. The SIOFA VMS CMM is yet to be re-considered by the MoP, but there has been some bilateral discussion between the proponent of the CMM and other interested parties to progress work on same.

3.7.3 Indian Ocean Commission, Plan Regional de Surveillance de Pêches[2]

The Indian Ocean Commission (IOC) *Plan Regional de Surveillance de Pêches (PRSP)* is a functional Regional VMS system, through which IOC States exchange VMS data within the Zone of Cooperation. The IOC States share VMS Data on foreign vessels operating within their respective EEZ, and that information is then stared with the rest of the IOC States. It is also important to mention that this initiative has no legal instrument governing its implementation. However, there are information sharing protocols in place to protect this information being shared within the states. The IOC hosts the regional VMS servers at the IOC headquarters, which benefits from relevant security and immunity from domestic laws. The system implements a shared decentralized system, with the monitoring done at the level of the IOC states and the IOC providing overall technical and administrative support.

3.7.4 The SADC MCSCC in Katembe, Republic of Mozambique

In July 2008 SADC Fisheries Ministers signed the SADC Fisheries Ministers' Statement of Commitment to stop IUU fishing, which highlighted the priority areas to curb IUU fishing in the region. The statement calls for strengthening the efforts to improve regional and inter-regional cooperation for fisheries governance and to reinforce MCS capacities at a regional level. In support of Article 9 of the Protocol, in 2017 Ministers responsible for Fisheries and Aquaculture approved a Charter for the establishment of a regional MCS Coordination Centre (MCSCC) in Mozambique. The centre is envisaged to further assist in promoting regional cooperation, information sharing, and cost-effective sharing of assets in the fight against IUU fishing.

[2] *Regional Fisheries Surveillance Plan*

***Picture 1**: In the picture are the representative from the Government of Mozambique, Namibia, South Africa, and Seychelles viewing the site where the MCSCC will be constructed at Katembe, Republic of Mozambique (Source: Stanley Ndara).*

Current status of the SADC Fisheries Monitoring Control and Surveillance Coordination Centre (MCSCC) The SADC MCSCC Charter became effective on 08 April 2023, after Botswana signed it on March 9, 2023. On 20 April 2023, the Interim Project Management Unit (IPMU) offices which is tasked to oversee the full implementation of the MCSCC, is currently located at the Ministry of Sea, Inland Waters and Fisheries (MIMAIP) in Maputo, Mozambique, were officially opened by Dr. Lidia Cardoso, the Minister of Sea, Inland Waters and Fisheries of Mozambique. Representatives from member states (Mozambique, Namibia, and Seychelles), and the SADC Secretariat led by Mr. Domingos Gove, Director of Fisheries Aquaculture and Natural Resources (FANR), and development partners were in attendance (picture 2).

Picture 2: *Interim Project Management Unit (IPMU) office being officially opened by Dr. Lidia Cardoso, the Minister of Sea, Inland Waters and Fisheries of Mozambique. (Source: SADC, 2023 SADC FISHERIES QUARTERLY UPDATE, VOL. 1, NO. 1).*

WWF is implementing the MCS component of the PROFISHBLUE project, which provides equipment for fishing vessel tracking. This equipment, including furniture, IT equipment, and TV monitors for real-time vessel tracking and information exchange (SeaVision and Basecamp), has already been purchased and installed at the MCSCC offices. The operationalization of the MCSCC is a significant milestone that the SADC countries and relevant actors have been preparing for over the past decade. It gives green light to the Government of the Republic of Mozambique to lay the foundation stone of the physical MCSCC Centre in Katembe, Maputo where the land has already been secured (picture 1).

Official documentation for the land was handed over to the Ministry of Sea, Inland Waters and Fisheries on Friday 21st April 2023 by the District Municipality of Katembe. The second phase which involves construction of the new dedicated MCSCC building in Katembe is funded by the World Bank. The tender for construction was launched in June 2023. During the Joint Meeting of Ministers of Agriculture and Food Security, Fisheries and Aquaculture held virtually on the 19th May 2023, the MCSCC Branding Strategy as well as the MCSCC Web Portal were approved. The MCSCC Web Portal is available on this link. https://sadcmcscc.org/.

Picture 3:*The official logo of the SADC Fisheries Monitoring, Control, and Surveillance Coordination Centre.*

b. SADC countries Membership to Regional Organisations

Table 1:*The SADC countries Membership to Regional Organisations (Source: IPMU, 2022).*

SADC Country/Regional Fishery Bodies	CCAMLR	CCSBT	SIOFA	ICCAT	IOTC	SEAFO	COREP	SWIOFC	LVFO	LTA	CECAF	COMHAFAT	NEPAD	COMESA	EAC	CIFAA	IOC
The Republic of Angola				X		X	X				X	X					
The Republic of Botswana																X	
The Comoros			X		X			X					X	X			X
The Democratic Republic of Congo							X			X	X	X	X	X		X	
The Kingdom of Eswatini													X	X		X	
The Kingdom of Lesotho																X	
The Republic of Madagascar			X		X			X					X	X		X	X
The Republic of Malawi													X	X		X	
The Republic of Mauritius			X		X			X					X	X		X	X
The Republic of Mozambique			X		X			X					X			X	
The Republic of Namibia	X			X		X						X					
The Republic of Seychelles			X		X			X					X	X			X
The Republic of South Africa	X	X		X	X	X		X					X				
The United Republic of Tanzania					X			X	X	X			X		X	X	
The Republic of Zambia										X			X	X		X	
The Republic Zimbabwe													X	X		X	

IUU fishing activities impacting these nations encompass fishing within restricted zones, use of illegal methods and equipment, presence of unlicensed foreign vessels, failure of foreign vessels to report or misreport their catches, and unauthorized or unregulated transfers of catch at sea. Consequently, the SADC stands to suffer significant losses due to IUU fishing, while actively engaging in worldwide initiatives to tackle these activities and establishing a regional approach would bring substantial benefits.

Table 2: *Current Status of Fisheries in the SADC region Marine and Inland Fisheries*

SADC Country	Licencing/ access control system	Vessel register	Logbook system/ catch data collection	Port State Measures operational	Cross checking to verify catch and landing data	Operations SOPs in place	Access to adequate patrol platforms
Angola	Industrial only	Industrial only	uncertain	Very limited	No	No	Yes, but platforms not operational
Botswana	No	No	No	n/a	V. limited	No	No
Comoros	industrial tuna fishery only	industrial tuna fishery only	industrial logbooks data uncertain / Artisanal data v. basic	No	No	No	No
Democratic Republic of Congo	No	No	No	No	No	No	No
Eswatini	Yes	No	No	n/a	No	No	No
Lesotho	No	No	uncertain	n/a	No	No	No
Madagascar	Industrial fishery only. Open access artisanal & traditional	Industrial only.	Industrial fishery only	Partially, - Industrial fishery	Partially, - Industrial fishery	Partially	Industrial fishery only
Malawi	No	No	V. limited	n/a	No	No	No
Mauritius	Yes	Yes	Yes Industrial fishery / Artisanal catch data limited	Yes	Yes	Yes	Only in Artisanal sector / Offshore - No
Mozambique	Yes	Yes requires coordination	Partially	Very limited	Very limited	Partially	No
Namibia	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Seychelles	Yes	Yes	Yes	Yes, in industrial tuna fishery	Yes, in industrial fishery	Partially	Yes
South Africa	Yes	Yes	Yes	Yes	Yes	Yes	Yes limited to industrial
Tanzania	Yes, Industrial & inland fishing. Open access small scale	Industrial & inland fishing. Open access small scale	Yes, Inland and Industrial fishing only	No	No	No	Yes Inshore and inland. Offshore no
Zambia	Industrial only?	Industrial only	Limited	n/a	No	Uncertain	No
Zimbabwe	Industrial only?	Industrial only	Limited	n/a	No	Uncertain	No

Section 4: Study results based on the automated online survey

4.1 The survey approach

In order to obtain a comprehensive understanding of this topic, an online questionnaire was distributed to professionals working in fields associated with aquatic resources across multiple countries in this region (as shown in table 3). To achieve this, an automated online link was administered to participants in the ESA region. The purpose of this study was to evaluate the extent to which MCS systems are utilized for preserving and safeguarding aquatic biodiversity in shared aquatic ecosystems in Eastern and Southern Africa. The descriptor on the online link read as follows. "The purpose of this questionnaire is to collect information for an AU-IBAR project titled *Assessment of the status of monitoring, control, and surveillance (MCS) systems for conservation and protection of aquatic biodiversity in shared African aquatic ecosystems in the east and southern regions of Afric*a. The baseline information will determine a pathway for institutional collaboration on MCS issues in the South-Eastern African regions. You may provide your name or remain anonymous as your details will not be disclosed to any third party other than collecting information for the purpose of this project assignment. Kindly return this form by 18 September 2023 to the consultants, Stanley Ndara at stickpiel@gmail.com and Dr. Victoria Erasmus at erasmus.victoria@yahoo.com"

Participating countries

Despite the widespread distribution of this questionnaire to relevant focal persons and experts in MCS, as well as to centres of excellence and RECs, the responses received were not as overwhelming as expected. This can be attributed to the limitations of virtual engagements, with the exception of Mauritius and Mozambique, where the consultant was able to visit in person. However, it is not possible for the consultant to determine the reasons for some countries' reluctance or inability to provide responses to the online questionnaires. It is expected that more countries will be willing to participate and provide responses during the validation phase. A total of twelve countries partook in this research initiative. The number of participants varied by country, with the highest number (12) coming from Namibia (as depicted in Figure 1).

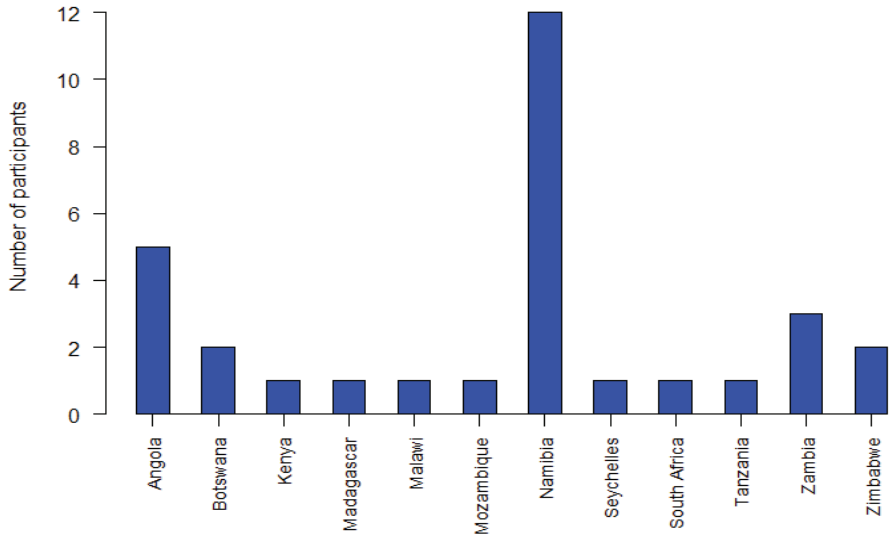

Figure 1: *Number of study participants per country.*

Countries in the eastern and southern African (ESA) region are described in Table 3.

Table 3: *Demographic information of countries in the ESA region (those that have completed the questionnaire).*

Country	Coastline	Shared aquatic bodies	MCS Agreements (Bilateral)
Angola	1600 km	Atlantic Ocean, Congo River basin, Okavango, Cunene River, Zambezi River	Protocol on Fisheries, Namibia, BCC, Congo River Basin, Kavango river basin
Kenya	640 km2	Lake Victoria, Lake Turkana, Tana River, Galana river, Mara River.	EAC, Ethiopia, Uganda, South Sudan
Madagascar	Over 1.2 million km2 of EEZ)	Mozambique channel, Mozambique channel marine ecoregion, Indian ocean, Canal des Pangalanes, Mahajamba Bay, Ampasindava Bay	Protocol on Fisheries, IOC, South Africa
Malawi	Landlocked	Lake Malawi, Shire River, Lake Chiuta, Lake Malombe	Protocol on Fisheries, Tanzania
Mozambique	2470 km	Indian ocean, Zambezi River, Lake Malawi, Lake Niassa, Pungwe river	Protocol on Fisheries, Namibia, South Africa, Malawi, Zimbabwe, Tanzania
Namibia	1572 km	Zambezi river, orange river, Cunene River,	Protocol on Fisheries, Angola, South Africa, Botswana
South Africa	2798 km	Indian ocean, Atlantic Ocean, Orange River, Limpopo River, Incomati river	Protocol on Fisheries, Namibia
Tanzania	1424	Lake Victoria, Lake Tanganyika, Lake Nyasa or Lake Malawi, Rufiji River, Ruvuma River	Protocol on Fisheries
Zambia	Landlocked	Zambezi river, Lake Tanganyika, Lake Mweru, Luangwa River, Limpopo River, Zambezi River	Protocol on Fisheries, Angola, Democratic Republic of Congo (DRC) Zimbabwe, Malawi, Tanzania
Botswana	Landlocked	Okavango Delta, Chobe-Linyanti-Zambezi River,	SADC Protocol on Fisheries, Namibia
Zimbabwe	Landlocked	Zimbabwe river, Lake Kariba, Limpopo River, Mnayame river, Save river	SADC Protocol on Fisheries
Seychelles	491 km	Indian ocean, coral reefs, seagrass beds, managrove forests, pelagic zone	IOC, MASE, Nairobi Convention, PRSP, WIOMSA

4.3 MCS systems in ESA countries

Having completed a technical report for the Benguela Current Convention, the consultants had the advantage of possessing up-to-date and pertinent information on the Monitoring, Control, and Surveillance Coordination Centre, including a comprehensive summary of MCS assets in some of the ESA countries, especially those in the BCC countries (see section 4.5).

According to Figure 2 below, approximately 93.9% of participants in this study acknowledged their knowledge about the presence of MCS systems in their respective countries. This finding suggests that countries situated in the ESA region have implemented MCS systems. As an illustration, Angola is known to have established seven regional MCS centers.

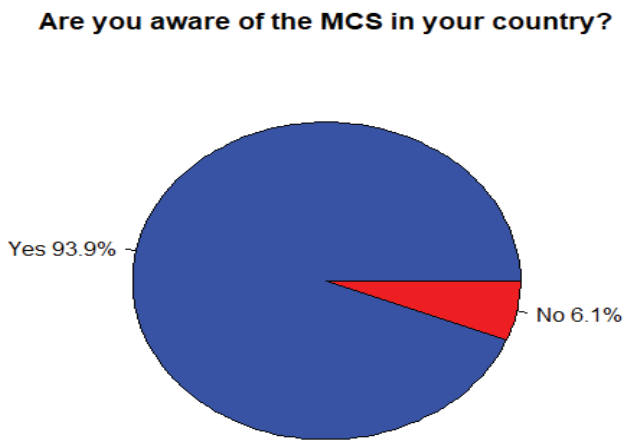

Figure 2: *Knowledge of the Monitoring, Control and Surveillance Coordination Centre in each country.*

4.4 The Monitoring, Control and Surveillance Coordination Centre (MCSCC) in Mozambique

a. Awareness of the MCSCC

The MCSCC in Mozambique is a part of the SADC's efforts to combat IUU fishing and other sea crimes. Countries that are part of the SADC MCSCC are Angola, Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania, and Zambia. Member States use Basecamp as a platform for sharing information. It is important to note that the MCSCC is still in its early stages since the charter became effective a few months ago, thus there is a need to identify various options to fund the MCSCC. Key to the function of the SADC MCSCC is the ability to share intelligence. For vessel tracking, Sea Vision, which is based on AIS technology, is utilized. The IPMU has received initial equipment such as computers, laptops, printers, big screens, internet, and furniture to support its startup process.

In this study, 66.7% of participants were aware of the MCSCC in Mozambique. Participants from Namibia, Botswana, Zambia, Kenya, South Africa, and Seychelles (Figure 3) were the 33.3% who did not know about the MCSCC. It is surprising that even participants from South Africa, which has signed the Charter to join the MCSCC initiative, were unaware of the centre, considering their close geographical proximity to Mozambique.

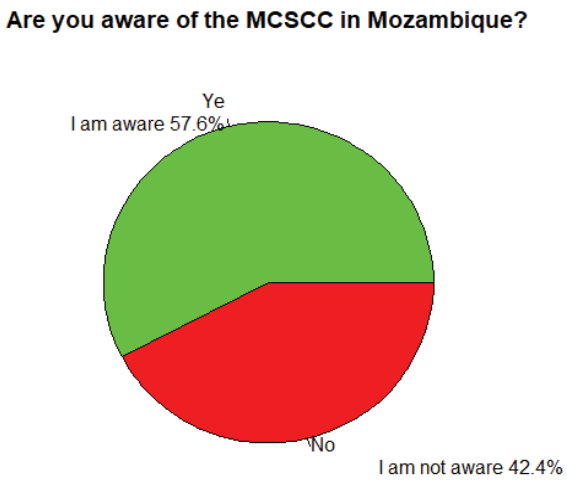

Figure 3: *Knowledge of the Monitoring, Control and Surveillance Coordination Centre (MCSCC) in Mozambique.*

b. Funding the MCSCC

The resources are insufficient for the demanding role of the MCSCC, and additional purchases are necessary to ensure efficient operation. Funds are also needed for maintenance and to store SADC MCSCC Basecamp data and information securely in the cloud. Additionally, the ability to conduct meetings via Zoom is essential, requiring the appropriate resources and capabilities. The study participants listed the following funding options:

- Member State contributions and donor support.
- Donor funds to operationalise the setting up of the centre and also assist member with their annual contributions.
- Partners and philanthropists.
- Donor funding has been received thus far, but starting in 2024 or 2025, State Parties will be required to contribute a minimum of USD10,000 per year. The IPMU is aware of the MCSCC and its funding mechanisms.
- The charter states that SADC Member States should contribute to the center, and other sources of funding include donors and projects directly related to MCS issues in SADC.
- The establishment of the Centre in Maputo is being supported by various entities such as WWF, Stop Illegal Fishing – SIF, PROFISHBLUE project, SADC Atlantic Project – USA Embassy in Botswana, and the Government of Mozambique, who are funding a portion of the Centre's activities.
- The Regional Technical Team and SADC Secretariat are currently working to identify additional funding sources. Possible sources of funding could include SADC Countries and Anti IUU fishing donors. Securing funds from potential donors is crucial for the successful operation of this project.
- There are various funding options that can be explored, such as sponsorship by SADC, public-private partnerships, user fees and levies, government budget allocation, and international donors and grants through bilateral or multilateral support.

4.5 Capacity building in relation to MCS systems

More than 60% of the participants in the study reported that they had not received any form of training or information related to MCS systems in their work involving aquatic biodiversity conservation, as shown in Figure 4. This finding underscores the importance of raising awareness about this topic. All participants from Kenya, Madagascar, Malawi, Seychelles, and South Africa confirmed that they had not been trained in MCS.

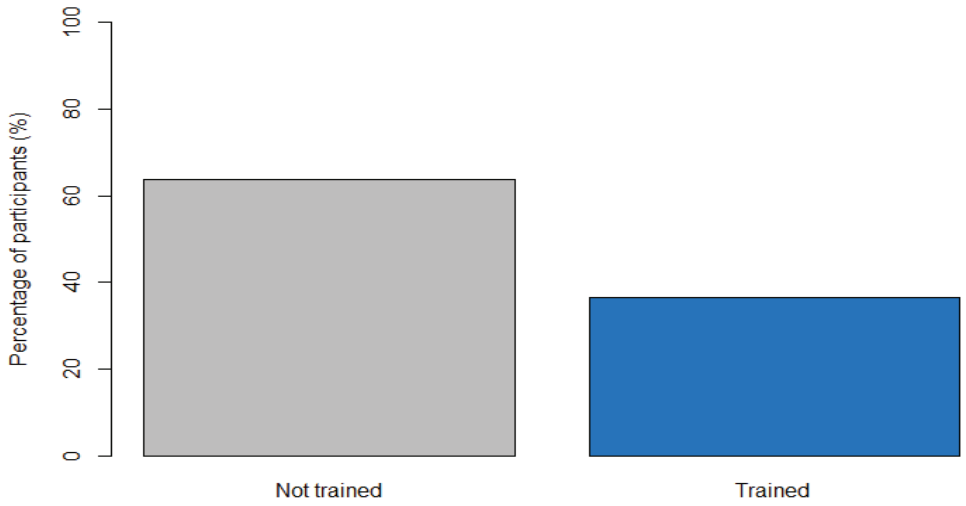

Figure 4: *Training and capacity building efforts on the implementation of a MCS systems for the conservation of aquatic biodiversity conservation.*

4.6 The effectiveness of MCS systems in ESA countries

Most participants have indicated that the MCS systems in place are satisfactory effective (Figure 5). Countries have functional MCS systems, for example Namibia has a functional VMS tracking with AIS and other functionalities. South Africa also has functional VMS tracking with multiple functionalities.

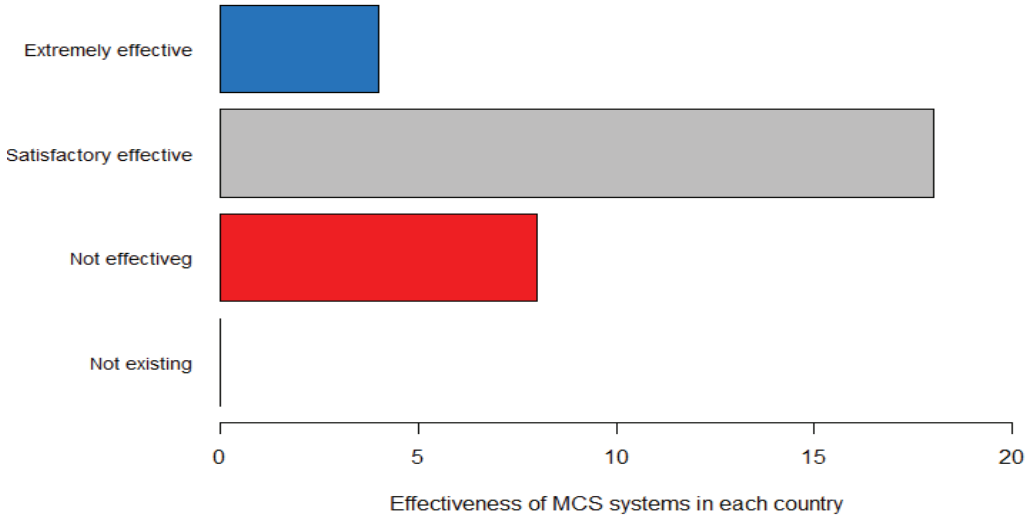

Figure 5: *Effectiveness of MCS systems in each country*

Due to the limited effectiveness of MCS systems, it is necessary to identify the main challenges faced in implementing and maintaining these systems in the ESA region. The following challenges have been identified:

- The high costs of tools and technologies create barriers to accessing MCS tools, patrol crafts, manpower, and modern technologies to combat IUU fishing.
- Adequate funding modalities are key to rolling out and ensuring the sustainability of MCS systems, as well as securing technical expertise and institutional support. There is a need for more commitment from minority Member States and partners.
- The lack of financial means to fulfil the duties of the MCSCC and support SADC Member States is an additional challenge. Some SADC Member States also do not engage in allocating qualified personnel to

serve the center. There is a lack of proper MCS tools to strengthen activities and promote collaboration among SADC countries.

- Corruption poses a challenge, as does the limited capacity of human resources. Cooperation between countries to share intelligence and catch IUU fishing suspects is also crucial.
- The vastness of the region presents a challenge to MCS implementation. Political and institutional challenges, funding mechanisms, capacity building of MCS staff, inefficient legislation and lack of inspections, weak policy, and the need for legislative adjustments are ongoing issues due to evolving global initiatives.
- Advancements in VMS technology, insufficient aircraft and vehicles, lack of training in the MCS field, inadequate patrol vessels, and a lack of drone systems are limiting factors.
- Implementation of MCS largely depends on support from partners, with limited support from government funds of member states. Existing support is often skewed towards marine fisheries, neglecting inland freshwater fisheries. There is also a lag in developing technologies for effective MCS implementation.
- Low community awareness and education are issues, and the MCS systems lack proper linkage and effectiveness. Information sharing mechanisms with other coastal states are also inadequate.
- Non-compliance and illegal fishing occur when vessel Automatic Location Communicators (ALC`s) are turned off in vessels.

4.7 MCS tools or technologies that are currently being used in aquatic ecosystems for conservation efforts

Countries use and enforce laws through MCS efforts, including patrols, inspections, and surveillance, to ensure compliance with fishing regulations. Non-compliant vessels can face penalties, fines, or seizure of equipment. MCS systems for each country are discussed below:

a. MCS systems in Angola

Angola has implemented several aquatic MCS systems to ensure the proper management and conservation of its marine resources. Some of the key initiatives and systems include:

- Angola has established Vessel Monitoring System (VMS) called *Monicap*, that requires all fishing vessels operating in its waters to be equipped with a satellite-based tracking device. There are seven (7) regional MCS centres-only 3 with VMS functionalities, which allow authorities to monitor vessel movements, detect unauthorized fishing activities, and ensure compliance with fishing regulations.
- Angola has also implemented Automatic Identification System (AIS), which is an automated tracking system that enables the monitoring of vessel movements and identification of ships in real-time. The AIS system enhances maritime safety and enables authorities to identify suspicious activities or vessels engaging in illegal fishing.
- Angola maintains surveillance and patrol vessels that conduct regular patrols in its waters to detect and deter illegal fishing activities. These vessels are equipped with advanced surveillance equipment, such as radar and sonar, to locate and track fishing vessels engaged in unauthorized activities.
- Angola also employs large patrol boats- 3, Medium size patrol vessels-10 and Small inshore boats-between 20-30, this allows for broader coverage and monitoring of Angola's vast maritime territory, aiding in the detection of illegal fishing activities.

- Angola has enacted comprehensive fisheries laws and regulations to govern and manage its marine resources.
- There is an observer program in Angola under the Ministry of Fisheries and Marine Resources, however the fisheries observers are less than 30.

b. MCS systems in Botswana

Botswana is a landlocked country in southern Africa and does not have any coastal waters or significant aquatic resources. As a result, the country does not have specific aquatic MCS in place. However, Botswana does have some land-based conservation efforts and monitoring systems to protect its rivers, wetlands, and other freshwater ecosystems. These systems focus on the monitoring and management of wildlife and water resources. Some of the conservation and monitoring Initiatives in Botswana include:

- The Department of Wildlife and National Parks (DWNP) in Botswana is responsible for managing wildlife resources, conserving biodiversity, and ensuring sustainable utilization of wildlife in Botswana's protected areas. They conduct regular monitoring and surveillance of wildlife populations and habitats.
- The Okavango Delta is a UNESCO World Heritage site and one of Botswana's most important natural assets. The government has implemented a management plan for the delta, which includes monitoring various ecological indicators, regulating tourism activities, and protecting endangered species.
- Botswana has several national parks and game reserves, such as Chobe National Park, Moremi Game Reserve, and Central Kalahari Game Reserve. These areas are monitored to prevent poaching, illegal fishing, and other illegal activities that could harm wildlife and ecosystems.
- The Department of Water Affairs monitors and manages water resources in Botswana to ensure sustainable use and protect freshwater ecosystems. This includes regular monitoring of water quality, river flow rates, and the health of wetland areas.

c. MCS systems in Kenya

Kenya is currently involved in port development in two locations, which will become designated ports with fisheries facilities once completed. If these developments increase vessel traffic as anticipated, Kenya will need more human resources to ensure compliance with the PSMA, which it became a party to in August 2017. Based on the Kenya Marine Fisheries and Socio-Economic Development (KEMFSED) Project Annual report (Government of Kenya, 2022), Kenya has a Marine MCS Strategy for 2017-2027.

The 2016 Act introduced an MCS unit within the Kenya Fisheries Service, but currently, their ability to carry out MCS activities is still limited. They are working on improving inspector training, procedures, and cooperation among different agencies. A new offshore patrol vessel has been acquired and assigned to the newly established Kenyan Coastguard. Inter-agency cooperation has improved, thanks to the establishment of the Presidential Task Force for maritime affairs. They achieve the objectives of MCS through employing the following:

- Air patrols
- offshore sea patrols
- nearshore sea patrols
- vessels installed with smart vessel tracking technology (VMS), and electronic monitoring system (EMS)
- vessels captured in the smart licensing system.

- joint MCS operations with KCGS/county/regional
- vessels inspected under Port State Measures (PSM)

In the case of Kenya, where 80% of the fisheries are small-scale near shore, there is typically a low deployment of fisheries observers due to this, resulting in a relatively low number of observers.

Kenya takes part in regional patrols under the IOTC PRSP and was involved in the FISH□i Africa Task Force, some aspects of which have been incorporated into the SADC MCSCC. Even though Kenya is not a SADC Member, it benefits from the SADC MCSCC, which promotes cooperation and communication among SADC Members and others. Kenya is also an active partner in SWIOFC and has supported the implementation of the MTCs. Kenya is a leader in promoting the development of the blue economy within the region.

d. MCS systems in Madagascar

The larger the coastal area the more MCS systems are required. For example, Madagascar has over 1.2 million km2 of an exclusive economic zone (EEZ). Madagascar has several aquatic monitoring, control, and surveillance systems in place to protect its marine resources. Some of these systems include:

- Madagascar also uses VMS to track the movement and location of fishing vessels in real-time. VMS helps authorities to monitor vessels' activities, detect illegal fishing or transshipment, and enforce fishing regulations.
- Madagascar uses satellite technology to monitor the country's exclusive economic zone (EEZ) and detect any unauthorized activities, such as illegal fishing. Satellite monitoring can provide real-time data on fishing vessel activities and helps in identifying potential areas of concern.
- Madagascar has implemented strict port control measures to prevent the landing and transshipment of illegal catches. This includes requirements for vessels to report their activities, inspections of incoming vessels, and verification of catch documentation.
- To improve data collection and facilitate reporting, Madagascar has implemented electronic reporting systems for fishing vessels. This enables fishers and authorities to report catch data, fishing activities, and compliance with regulations more efficiently.
- In collaboration with local communities, Madagascar has established community-based surveillance systems to monitor and report illegal fishing activities. Local fishers and coastal communities act as the "eyes and ear" on the ground, helping authorities to detect and combat illegal fishing activities.
- Madagascar conducts aerial surveillance to monitor its EEZ and detect any suspicious activities, including illegal fishing. Aerial patrols are conducted regularly to cover wide areas and provide an overview of the marine environment.
- Various government agencies, such as the Ministry of Fisheries and Marine Resources, Ministry of Environment, and the National Navy, collaborate and coordinate efforts to enhance aquatic monitoring, control, and surveillance. These agencies work together to share information, identify areas of concern, and jointly enforce fishing regulations.

e. MCS systems in Namibia

One primary component of the MCS systems in Namibia is the establishment of protected areas, such as marine parks and reserves. These designated areas act as critical zones for the conservation of aquatic biodiversity, providing a safe haven for numerous species and ecosystems. MCS efforts involve patrolling these protected areas, enforcing regulations, and preventing illegal activities such as overfishing, poaching, and harmful practices that can harm biodiversity.

Namibia boasts with two (2) patrol vessels, two (2) air patrol crafts, and patrol vehicles to enhance its maritime security and shore patrols. The country relies on VMS as the primary technology for monitoring aquatic ecosystems. In addition, a VMS system with AIS is in place. To oversee compliance, there are fisheries inspectors and the Fisheries Observers Agency (FOA) that coordinate the deployment of fisheries observers to licensed fishing vessels. The FOA currently has 129 fisheries observers. Furthermore, there are specific fisheries laws and regulations that govern the harvesting, handling, and processing of marine resources. As an example, there is a regulation concerning seabird bycatches in the hake trawl and longline fishery, which requires fishing vessels to use bird scaring lines to reduce the number of seabird mortalities.

f. MCS systems in Seychelles

The Seychelles has a number of aquatic Monitoring, Control, and Surveillance (MCS) systems in place to effectively manage and protect its marine resources. Some of the key systems include:

- The Seychelles Fisheries Authority (SFA) has implemented a VMS that tracks the movement of fishing vessels in real-time. The VMS uses satellite technology to monitor vessel positions, enabling authorities to detect illegal fishing activities and ensure compliance with fishing regulations.
- Radar systems are utilized to monitor and control the movement of vessels within Seychelle's Exclusive Economic Zone (EEZ). This helps to detect and deter unauthorized activities such as illegal fishing, poaching, and smuggling.
- The SFA also employs about 50 trained fisheries observers who are deployed on fishing vessels to monitor and collect data on fishing activities. These observers ensure compliance with fishing regulations, collect scientific data, and report any suspicious or illegal activities.
- The Seychelles Coast Guard conducts regular aerial surveillance patrols using aircraft to monitor and control maritime activities. These patrols help to detect and deter illegal fishing, piracy, and other maritime crimes.
- The Seychelles collaborates with various international, regional, and local organizations to gather intelligence on illegal fishing activities and share information. This includes partnerships with Interpol, the Regional Fisheries Surveillance Centre for Eastern and Southern Africa, and neighbouring countries.
- The SFA conducts thorough inspections of vessels entering or leaving Seychelle's ports to ensure compliance with fisheries regulations. This includes verifying fishing licenses, catch documentation, and other relevant paperwork.
- The Seychelles has a robust legal framework to address and prosecute illegal fishing activities. The penalties for illegal fishing include fines, imprisonment, and seizure of assets. This acts as a deterrent to potential offenders.

g. South Africa

The aquatic Monitoring, Control, and Surveillance (MCS) systems in South Africa include various measures and programs to monitor, control, and enforce regulations related to the country's aquatic resources. Some of the key components of these systems are:

- South Africa uses VMS to monitor and track the position and activities of fishing vessels operating in South African waters. It provides real-time data on vessel locations, movements, and fishing activities, enabling authorities to detect and prevent illegal fishing.
- AIS is a tracking system used primarily for navigational purposes but also aids in monitoring vessel movements and identifying potential illegal fishing activities. It allows authorities to track vessels and identify any suspicious or unauthorized behavior.
- Trained fisheries inspectors are deployed to conduct regular inspections and patrols along the coastlines and at ports to ensure compliance with fishing regulations. They inspect fishing vessels, check catch documentation and monitoring systems, and enforce the laws related to fishing activities.
- There is a fisheries observer program funded by the fishing industry, this begs the question of independence. Furthermore, observers in South Africa are only deployed to foreign vessels.
- The MCS systems in South Africa utilize patrol vessels to conduct surveillance and enforcement activities. There are three inshore modern fisheries protection vessels and 1 offshore protection vessel. This includes routine patrols, spot-checking of vessels, and responding to reported cases of illegal fishing.
- South Africa also utilizes remote sensing and satellite technology to detect and monitor areas prone to illegal fishing activities. Satellite imagery and data are used to detect illegal fishing vessels and track their movements.
- Fishers are required to submit catch and effort data electronically through the Electronic Reporting System and the Integrated Catch Data System. This allows authorities to monitor fishing activities, ensure compliance, and make informed fisheries management decisions.
- South Africa actively collaborates with regional and international organizations, such as the South Indian Ocean Fisheries Agreement (SIOFA) and the Indian Ocean Tuna Commission (IOTC), to strengthen MCS efforts and combat illegal fishing activities in the region.

h. Tanzania

Aquatic monitoring, control, and surveillance systems in Tanzania are implemented to ensure the sustainable management and conservation of the country's aquatic resources. These systems aim to monitor and control fishing activities, reduce illegal, unreported, and unregulated (IUU) fishing, and protect marine ecosystems. Some of the key components of aquatic monitoring, control, and surveillance systems in Tanzania include:

- Tanzania uses VMS to track the movements of fishing vessels in real-time. It enables authorities to monitor vessel positions, fishing activities, and adherence to fishing regulations.
- AIS is a tracking system primarily used for safety of navigation, but it also provides valuable data for fisheries monitoring. It allows authorities to identify vessels and collect information on their characteristics, location, speed, and heading.
- Tanzania has established a Fisheries Monitoring Center to monitor and analyze data received from the VMS and AIS systems. The center coordinates the surveillance and control activities related to the

fishing industry.

- Tanzania's fisheries authorities use patrol vessels to conduct regular patrols and inspections in the country's waters. These vessels help identify and intercept IUU fishing activities, enforce fishing regulations, and ensure compliance with the law.
- The country has implemented a Fishery Observer Program where trained observers are stationed on commercial fishing vessels to monitor fishing activities, collect data on catch composition and fishing effort, and ensure compliance with regulations.
- Communities living around marine and freshwater resources also play an important role in monitoring and reporting illegal fishing activities. This community-based surveillance system works in collaboration with authorities to enhance monitoring and control efforts.

i. MCS systems in Zambia

- None at the moments but exploring options for VMS tools.
- Co-management.
- MCS systems in Zimbabwe
- VMS which is currently under trials on Lake Kariba.

4.8 The role of the MCS systems in prevention or mitigating threats to aquatic biodiversity in the shared African aquatic ecosystems

Most of the survey participants have indicated that they have observed instances where the MCS systems in their countries have successfully prevented or mitigated threats to aquatic biodiversity.

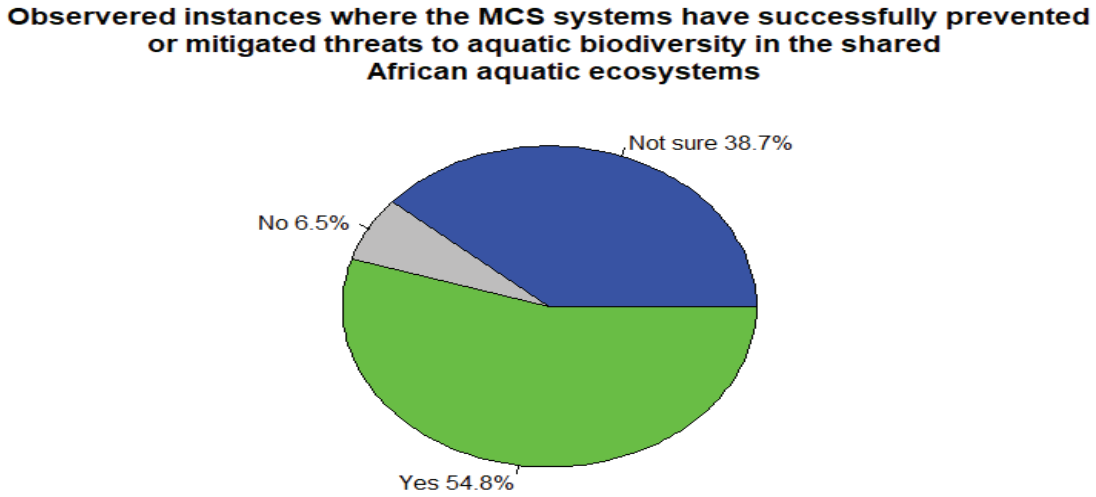

Figure 6: *Have you observed any instances where the MCS systems have successfully prevented or mitigated threats to aquatic biodiversity in the shared African aquatic ecosystems?*

4.9 Gaps in the current MCS systems

- Coordination between different entities within and between countries
- Failure to capture catch weight.
- Need to improve surveillance through a region VMS.
- The number of fisheries observers deployed varies greatly depending on the type of fisheries, however,

there is a need for Fisheries Observer programs and coordination through MCSCC; need for joint fisheries patrols.

- Domestication of PSMA in Member States and better coordination and capacity building through MCSCC.
- Lack of cooperation between the MCS Experts, lack of MCS tools and weak technical capacity of MCS personnel. Weak policies to implement MCS systems. Lack of engagement between MCS institutions to share experience.
- education and the lack thereof.
- Legislation and Policy.
- Introduce drone systems for effective coverage.
- Port state need to work together to mitigate the surge in IUU fishing activities. Currently some states have no capacity whatsoever and IUU fishing activities are rampant in those countries, which ultimately affect the fisheries/swaddling stock.
- Different priorities by countries with shared resources.
- Use of satellite technology.
- There is always room for improvement, if other technologies can be introduced into the MCS programme to complement the existing one, this will enhance the MCS programme in the region.
- Decentralize some instruments to smaller officers especially Lüderitz.
- Regional coordination and cooperation.
- MCS staff needs continuous capacity building, legislation needs to be harmonized and penalty systems needs adjustment, information sharing needs to improve, coordination with MCSCC improved risk assessment on suspected IUU fishing vessels.
- Technology Advancement, Understanding of Investigating fisheries related crimes.
- Improvement required in terms of managing and monitoring MPAs. There is no constant monitoring to inform those dependent on the resource on how its recovering once an MPA is declared.
- Development of technologies and tools as well as capacity to conduct MCS.
- There is need for community education and awareness on water resources conservation and protection, and the responsibilities of each stakeholder.
- Training funds.
- Inter-agency cooperation.
- The gap is due to the lack of maintenance of the ALC.

4.10 IUU fishing incidences reported per region between 2021 and 2023

The majority of survey respondents have indicated a lack of information availability, suggesting that data on IUU fishing needs to be gathered directly from institutes that handle such records. The occurrence of IUU fishing differs across regions due to varying regulations and structures in place.

Angola has implemented stringent port controls to ensure that all fishing vessels entering or leaving its ports are properly registered, licensed, and compliant with fishing regulations. Authorities conduct inspections and document verification to prevent illegal, unreported, and unregulated (IUU) fishing activities.

In Kenya, the Kenya Fisheries Service (KeFS), a regulatory and management organization responsible for issuing fishing licenses, receives reports of IUU fishing activities. Kenya has organized various global ocean summits that have raised awareness about maritime security, IUU fishing, and sustainable development. Historically, Mombasa port has been considered a high-risk port. However, there have been improvements in the enforcement of port State measures, as seen in the denial of port services to a high-profile IUU fishing vessel in 2016, which was illegally fishing in Somali waters. The enhancement of maritime security and safety is also a significant development that affects fisheries in Kenyan waters.

The CSP Madagascar report indicates that rare instances of IUU fishing can be found in industrial fishing in Madagascar. However, it is much more prevalent in small-scale fishing and the gathering of fishing products. The presence of Chinese fishing trawlers in Madagascar's waters suggests the occurrence of IUU fishing. According to OceanMind, a minimum of 14 Chinese industrial vessels have been identified engaging in IUU fishing in Madagascar's waters in recent times.

The management of fisheries in Namibia is generally effective. Namibia already has favorable factors in place to combat IUU fishing. These factors include the proximity and interconnectedness of the fishing and processing sectors, as well as policy support for the fishing industry. Namibia is an original member of the High-Level Panel for a Sustainable Ocean Economy. Additionally, Namibia's fisheries are considered to be well regulated through the implementation of Total Allowable Catch (TAC) systems. The main fishery in Namibia, which includes hake trawl and longline fishing, has obtained MSC certification, indicating its responsible management.

4.11 Regional or international capacity building initiatives supporting the implementation of MCS systems in the aquatic systems in each country.

The programs offered by each country are not extensive. While the FishFORCE Academy has developed training programs, there is a need to enhance collaboration between MCSCC and Fish FORCE Academy. Funding is required to develop a comprehensive set of training courses that aid member States (inland and coastal) through focused capacity building efforts. Additional training sessions in other MCS areas are necessary to fortify MCSC's capabilities and provide assistance to SADC member states.

Table 4: *initiative per ESA countries*

Country	Initiative/program
Angola	• Guardians of the Mwangole (Angolan) in Benguela
Botswana	• Ministry of Environment Natural Resources Conservation and Tourism • Stop Illegal Fishing • Fish Force Academy
Kenya	• NPOA for IUU fishing
Madagascar	• Some NGOs are working closely with small-scale fishermen
Malawi	

Mozambique	• Some MCS information is being generated by the IPMU through its daily activities in the Centre. • Initial training through SADC Atlantic project have been conducted in South Africa and Namibia focusing on mentoring and evidence collection, and risk analysis of AREP information submitted from foreign Fishing vessel wishing to enter in port and conduct proper fishing vessel inspection. • The IPMU staff received training on the operation of the Sea Vision platform, enabling them to monitor the SADC MS EEZ and detect potential threats. They also conduct investigations and share the gathered information with other SADC MS through the base-camp platform, which serves as a tool for MCS experts to exchange information.
Namibia	• Every year, the Nelson Mandela University provides training in law enforcement for fisheries inspectors and observers. • In partnership with UNAM, the FishFORCE Academy offers courses in MCS to fisheries inspectors and the judiciary. Additionally, training courses on risk assessment, investigation, evidence collecting, and analysis was conducted in 2022 and May 2023 as part of the SADC ATLANTIC Project. These courses were offered to Namibian Police Force (Nampol), immigration and customs, and NAMPORT. • FishFORCE Academy in partnership with UNAM conducted MCS related training courses to fisheries inspectors as well as the judiciary. • Nampol, immigration and custom, NAMPORT in 2021/22 • SADC ATLANTIC Project–- Training courses in Risk Assessment on foreign fishing vessels, investigation, evidence collecting and analysis in 2022 and May 2023 • Albatross Task Force
Seychelles	
South Africa	• Albatross Task Force
Tanzania	• Law enforcement training and Inspector course 2022
Zambia	• Lake Tanganyika Authority (LTA) has facilitated some capacity building for enforcement officers.
Zimbabwe	• ProfishBlue funding for shared water courses targeting Lake Kariba where Zimbabwe and Zambia will pilot MCS tools and have capacity building initiatives

4.11.1 Enhancing the MCS efforts for aquatic biodiversity conservation in these African aquatic ecosystems

- In order to improve the efforts for conserving aquatic biodiversity in African aquatic ecosystems through MCS, it would be helpful to identify resources and support that can enhance these efforts. This would involve MCS tools and promoting coordination among member states. Capacity building, particularly for fisheries inspectors, would be crucial. This includes providing adequate training for staff members to effectively perform their duties, as well as additional training and availing hand-held devices that can supplement monitoring. Furthermore, capacity building in MCS and patrol crafts, as well as training in MCS and technologies, should also be prioritized.
- Sufficient funding is required to strengthen the institutions for MCSCC, including establishing governance structures and recruiting technical staff for the MCSCC Secretariat. Funds are also needed to cover operational expenses for the approved list of services for MCSCC, as well as for equipment, research and education support, networking, information exchange, and cooperation among Member States. Additionally, funding and knowledge are required to effectively implement MCS systems, which can be addressed through the development of training programs. Financial assistance is necessary to acquire patrol vessels and other tools such as VMS, AIS, and internet connectivity. Furthermore, a fund should be established to support capacity building, skills development, and infrastructure improvement to enhance MCS efforts, including financial support to purchase new or upgrade existing MCS systems.
- In order to effectively combat IUU fishing activities, it is necessary for patrol craft such as vehicles, outboard engines, boats, and drones to be equipped with advanced MCS technology. This should include proper after-sales support and maintenance services.

- The region should adopt a collaborative approach to tackle IUU fishing, and the presence of strong political commitment is crucial in achieving this goal.
- All coastal states should establish connections with regional Monitoring, Control, and Surveillance Coordination Centers (MCSCC), such as Mozambique, those in the Indian Ocean and West Africa, FAO, or regional experts. These connections will help in the process of revising policies and legislation to create a harmonized regional framework.
- Raising awareness involves community education, promoting involvement in decision making, and increasing knowledge about conserving aquatic resources within local communities.
- There is a need for the acquisition and installation of advanced VMS technology in the region including adequate financial and human resources.
- The ESA region should establish more monitoring centres to supplement the SADC MCSCC to cover countries such as Somalia that are susceptible to piracy and IUU fishing.
- The acquisition of skills to implement MCS systems can be resolved through the creation of training programs. Additionally, patrol vessels and various tools such as VMS, AIS, and internet connectivity can also assist in this process.
- Member states have to be transparent at all material times.

4.11.2 International and regional instruments encouraging Member/Partner States to align their policies, legislation, and regulatory frameworks with, in relation to the protection and conservation of aquatic biodiversity and ecosystems

The instruments listed below play a key role in encouraging countries to align their policies, regulations, and other laws.

- Protocol on Shared Water courses,
- Strategic Plan for Biodiversity 2011-2020
- SADC Regional Indicative Strategic Development Plan (RISDP),
- SADC Regional Agriculture Policy (RAP),
- SADC Statement of Commitment to Combat IUU Fishing,
- Charter Establishing MCSCC,
- Comprehensive Africa Agricultural Development Programme (CAADP),
- Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS),
- Charter for the establishment of MCS Centre,
- IOTC agreement
- IPOA, UNFSA, CT188, STWCF 1995, CTA 12, UNFSA 1995,
- Compliance Agreement 1993, UNESCO
- UN African Union–- Inter-African Bureau for Animal Resources vii Fish Stocks Agreement International Plan of Action to Prevent, Deter, and Eliminate, Illegal, Unreported an Unregulated Fishing (IPOA-IUU)""
- ICCAT, CCMRA, SEAFO, BCC, IUCN, CITES
- UN Compliance Agreement, 1993,
- FAO Port State Agreement, 2009,
- United Nations Law of the Sea Convention (UNCLOS), 1982, Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995,

- United Nation Convention on Biological Diversity (CBD): The CBD is an international treaty that promotes the conservation of biodiversity and sustainable use of its components. It encourages countries to develop national strategies and legislation for the conservation and sustainable use of aquatic biodiversity.
- United Nations Fish Stocks Agreement (UNFSA): The UNFSA is an international agreement that provides a framework for the sustainable management of straddling and highly migratory fish stocks. It encourages cooperation among countries and the conservation and management of these stocks.
- Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries: The Code of Conduct provides guidelines and principles for responsible fisheries management, including the conservation and sustainable use of aquatic resources. It encourages countries to develop policies and regulations in line with its principles.
- SADC Protocol on Fisheries: The Southern African Development Community (SADC) Protocol on Fisheries provides a regional framework for the conservation and sustainable utilization of fisheries resources in southern Africa. It encourages member states to align their policies, legislation, and regulatory frameworks with the protocol.
- Benguela Current Convention: This regional agreement focuses on the conservation and effective management of transboundary species in the BCLME (Benguela Current Large Marine Ecosystem) which spans eastern and southern Africa. It encourages member countries to coordinate their policies, legislation, and regulatory frameworks for the protection of the ecosystem and its biodiversity.
- IMO
- Convention on the management of Lake Tanganyika, Conversion of Biodiversity, Fish protected areas, Small-scale fisheries (SSF) guidelines, Zambian Fisheries Act.
- Regional Plan of Action-IUU (RPOA-IUU) and National Plan of Action-IUU (NPOA-IUU).

4.12 Ecosystem Approach to Fisheries (EAF)

- Each country provided the following information when asked about their utilization of the EAF in managing marine and inland ecosystems in each region, as well as a list of ecosystems in which they employ the EAF, and the specific form of support offered by their technical partners.
- Angola has stated its participation in the EAF Nansen program in collaboration with the FAO, which focuses on the management of aquatic ecosystems and coastal systems.
- Botswana Indicated that an EAF was created for the Okavango delta and Chobe River systems using FAO TCP, which entailed implementing fishing bans and regulating fishing activities with permits.
- Mozambique has implemented Fisheries Management Plans that adopt the EAF. FAO has organized various training courses for nationals, enabling them to adhere to the ecosystem approach. This approach is promoted through various protocols and other related instruments. The Ecosystem Approach to Fisheries is being applied in the Shallow water shrimp -Sofala Bank Maputo Bay fisheries, with FAO providing both technical and financial support as a partner.
- Namibia is signatory to all the relevant international legally binding agreements related to an ecosystem approach to fisheries (EAF). The provisions of the EAF, as outlined in Appendix A of the EAF Legal Diagnostic Tool, are properly incorporated into Namibia's national policies and legal frameworks, including those non-binding instruments that Namibia has endorsed or adopted. In order to assess the implementation of the EAF through national policies and legal frameworks, the Food and Agriculture

Organization (FAO) has developed a diagnostic tool. Namibia underwent an assessment process using this tool, which involved the participation of officials from the Ministry of Fisheries and Marine Resources (MFMR) in Namibia. The assessment report was initially drafted in July 2021 and submitted to the MFMR in October 2021 for review. After receiving input from MFMR officials, the report was revised and resubmitted in October 2022. The MFMR of Namibia officially endorsed the EAF Legal Report of Namibia in February 2023. The EAF encompasses several aspects, including monitoring and research, regulatory frameworks, and biodiversity conservation. Scientists and managers in the region have received training on the EAF to enhance their capacity in this approach.

South Africa: No responses.

Tanzania: The Beach Management Unit (BMUs) and Guidelines for small scale fisheries are part of the EAF program`s development.

Zambia has the importance of the Ecosystem Approach to Fisheries (EAF) has been recognized by policies and legal framework, which now demand a comprehensive approach to developing management plans. These plans should consider all resource users and aim to preserve and conserve biodiversity through catchment area management. It is important to consider both aquatic and terrestrial species in order to maintain ecological balance and integrity. Fisheries management involves using the correct fishing gear and methods, requiring fishing licenses to control fishing effort, restricting fishing in fish breeding grounds, and implementing annual closed fishing seasons. Specific management plans have been developed for Lake Tanganyika, Kafue including Lake Itezhi-tezhi, Lower Zambezi, Upper Zambezi, and Kambompo fishery areas, such as "Lower Zambezi Ithezhi-tezhi Kafu".

Zimbabwe has The EAF has provided help in creating a Fisheries Management Plan for Lake Kariba and the Zambezi basin, and the FAO has also given support to its implementation.

1. Adherence to sustainable fishing effort levels particularly on shared watercourses.
2. Need for periodic surveys to ensure fishing effort levels are adhered to.
3. Setting up of cost-effective VMS systems that ensure timeous MSC and reactions to infringements.
4. Fishing closures or catch quotas are good measures but most effective controls in inland waters are difficult to enforce.

Section 5: Summary of the key findings and observations from the assessment

Most ecosystems are attempting to implement EAF, such as Lake Malawi/Niassa/Nyasa, Lake Kariba, the Zambezi River Basin, the Southwest Indian Ocean, and the Southeast Atlantic Ocean. However, these efforts are currently limited in scale, resulting in less positive outcomes. It is necessary to fully incorporate EAF and secure funding to support SADC in promoting research, capacity building, and advocacy. The SADC region needs to fully internalize EAF and EAA through the development of regional guidelines and the implementation of capacity building programs. All efforts should focus on enhancing the resilience of aquatic ecosystems to support sustainable aquatic food systems, including blue economy trade corridors. Inter-agency cooperation among entities dealing with MCS is crucial. It is vital to strengthen cooperation between member states in the SADC region and raise awareness about the significance and benefits of MCS systems. Sharing information and resources would assist the region in addressing the problem. Additionally, there is a need for awareness and capacity building among MCS staff and authorized officers, such as the Navy, Marine Police, Coast Guard, Maritime Administration, Customs, and Port Authority. The Ministry of Environment, Natural Resources Conservation, and Tourism should prioritize addressing the issue of IUU fishing. Training in VMS, inspections, and the use of drones for surveillance in the N.EEZ, rivers, lakes, and water bodies is necessary. Funding for patrol crafts is also essential. Promoting community awareness and establishing community watchdogs would aid in the conservation of aquatic resources and ensure stakeholder responsibilities are upheld. It is crucial to assist all fisheries and raise awareness about the importance of MCS at the national and regional level. Inland states currently have limited capacity for MCS, so efforts should focus on identifying gaps in legislation, educating stakeholders about ecosystem-based fisheries management, and implementing environmental measures. The improvement of MCS services in the region needs to be more cohesive, transparent, and effective to combat IUU fishing and protect aquatic biodiversity. Establishing partnerships or investing in philanthropic organizations focused on aquatic life protection is recommended. Lack of funding is a major obstacle in implementing effective MCS systems in the region. Funding is required for institutional strengthening of MCSCC, including the establishment of governance structures and recruitment of technical staff for the MCSCC Secretariat. Funds are also needed for operational services approved for MCSCC, equipment, research and education support, networking, information exchange, and cooperation among Member States. Assistance should be provided to acquire electronic monitoring systems, such as VMS and AIS, and capacity building for fisheries inspectors.

Despite the fact that participants from Somalia have not shared information through the online link, a participant from that country did raise some important concerns during the virtual validation on 30 November, 2023 which was organized by AU-IBAR. How can regional cooperation be strengthened to restore peace, eliminate piracy and combat IUU fishing in Somalia, where these issues are compounded by terrorist activities with the potential to destabilize the country?

IUU fishing is a significant issue in Somalia, with foreign vessels exploiting its weak governance and enforcement capacity to illegally fish in its waters. This has led to the depletion of fish stocks, loss of livelihoods for local fishermen, and the degradation of the marine environment. The lack of effective fisheries management and enforcement mechanisms has further exacerbated the problem.

The link between IUU fishing and terrorism in Somalia is complex, but there are indications that the proceeds from illegal fishing have been used to fund terrorist activities in the region. The insecurity and instability in Somalia have also made it easier for criminal networks involved in IUU fishing to operate with impunity.

To assist Somalia in addressing the issue of IUU fishing, the region can provide support in strengthening the country's maritime security and law enforcement capabilities. This can involve providing training and resources to improve surveillance and monitoring of its waters, as well as supporting the development of effective fisheries management and governance systems.

In terms of laws related to the protection of aquatic biodiversity, Somalia has made efforts to address the issue through its Fisheries Law and other regulations. However, the implementation and enforcement of these laws have been challenging due to the country's political instability and limited capacity.

Combatting illegal, unreported, and unregulated (IUU) fishing in Somalia could have several potential impacts on the financing of terrorist groups in the region.

Disruption of revenue streams: IUU fishing is a significant source of income for terrorist groups in Somalia, as they often extort money from illegal fishing operations in exchange for allowing them to continue. By combatting IUU fishing, the revenue streams of these terrorist groups could be disrupted, making it harder for them to finance their operations.

Weakening of economic ties: IUU fishing often involves collusion with corrupt officials and business interests, including those with ties to terrorist groups. By cracking down on IUU fishing, these economic ties could be weakened, reducing the ability of terrorist groups to finance their activities through the fishing industry.

Increased pressure on financial institutions: Combating IUU fishing could also lead to increased scrutiny of financial transactions related to the fishing industry, making it harder for terrorist groups to launder money or move funds through legitimate channels.

Destabilization of support networks: IUU fishing provides employment and financial support to local communities in Somalia, some of which may have ties to terrorist groups. By disrupting these support networks, combatting IUU fishing could weaken the base of support for terrorist groups, making it harder for them to recruit and operate. When the region combat IUU fishing in Somalia it could have a significant impact on the financing of terrorist groups in the region, ultimately contributing to greater stability and security.

5.1 Recommendations for improving MCS systems for aquatic biodiversity conservation and protection in shared African aquatic ecosystems

The Protocol on Fisheries (2001) recognizes RFBs (Regional Fisheries Bodies) and RFMOs (Regional Fisheries Management Organizations) as Appendix 2 organizations. This recognition requires closer collaboration between these organizations and the Southern African Development Community (SADC).

In this regard, SADC collaborates with the South West Indian Ocean Fisheries Commission (SWIOFC), which is an RFBA in the Indian Ocean. The majority of State Parties to the SWIOFC Agreement are also members of SADC, including Comoros, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and the United Republic of Tanzania. The role played by SWIOFC in the implementation of the Protocol is vital, thus it is important to strengthen relations between the two organizations.

One specific area for cooperation between SWIOFC and SADC that has recently been identified is the establishment of a regional mechanism to strengthen fisheries monitoring, control, and surveillance (MCS) to combat IUU fishing. In this regard, the SADC Fisheries Monitoring, Control, and Surveillance Coordination Centre (MCSCC) in Maputo, Mozambique has been designated for the implementation of this cooperation. The focus will mainly be on developing Minimum Terms and Conditions (MTCs) for fishing access, with a particular emphasis on MCS.

The ESA region must redouble their efforts in monitoring `stateless` vessels and those that switch off their AIS particularly when entering or exiting different EEZs.

The AU-IBAR can take on a crucial role in the partnership by facilitating and coordinating efforts between SADC and SWIOFC. It can provide technical expertise, share best practices, and support capacity building initiatives. In addition, the AU-IBAR can act as a platform for information exchange, policy development, and harmonization of approaches. By actively participating in the partnership, the AU-IBAR can contribute to the overall success and effectiveness of the collaboration between SADC and SWIOFC.

5.2 Funding Mechanisms for the SADC Fisheries Monitoring Control and Surveillance Coordination Centre (MCSCC) in Maputo, Mozambique.

Background

The SADC Fisheries Monitoring Control and Surveillance Coordination Centre (MCSCC) in Maputo, Mozambique is a regional subsidiary organisation that was established in 2023 through the SADC MCSCC Charter. It was created by Member States of the Southern African Development Community (SADC) with the aim of improving fisheries MCS in order to combat IUU fishing in the SADC region. The main functions of the MCSCC are to:

1. promote regional fisheries governance through capacity building and harmonisation of standards for operations.
2. cost-effectively coordinate the utilisation of regional MCS assets to stop illegal, unreported, and unregulated fishing.
3. establish and deliver regional operational fisheries monitoring, control and surveillance training aligned to international standards.
4. establish a harmonised regional register of fishing vessels that operate within State Parties' waters or are flagged by State Parties.
5. promote establishment of common regional fisheries monitoring, control and surveillance standards and policies.
6. establish and maintain a regionally harmonized fishing vessel monitoring system (VMS), to facilitate the

sharing of national VMS information under agreed protocols.

7. establish a central web-based portal where fisheries monitoring, control and surveillance information can be accessed.
8. coordinate and harmonise the regional national observer standards, observers, and observer reporting.
9. coordinate and provide advice and support for fishery law enforcement activities.
10. offer facilitation and support towards the implementation of standards and capacity building for port state measures support institutional and human capacity building to improve national fisheries monitoring, control, and surveillance capability, and
11. facilitate cooperation with other stakeholders in fisheries monitoring, control, and surveillance activities and other efforts geared towards the fight against IUU fishing; and develop mechanisms for financial sustainability of the MCSCC.

The MCSCC mandate is aligned with the objectives of SADC, as expressed in the key strategic and policy documents such as the Regional Indicative Strategic Development Plan (RISDP) (2020-2030), Regional Agricultural Policy (RAP) (2014), Protocol on Fisheries (2001) and the SADC Statement of Commitment to Combat IUU fishing (2008). MCSCC mandate also aligns with the objectives of the FAO Code of Conduct for Responsible Fisheries (1995), FAO Port State Measures Agreement (2009), the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS) (2014), and the Sustainable Development Goals (SDGs) and other relevant instruments.

The operational model of MCSCC is based on building strong partnerships and promoting of multi-sectoral approaches to enforcement while focusing on addressing the needs of Member States in building sustainable communities and ensuring sustainable environments to achieve sustainable economies. Within the region, it has strong ties to the national Fisheries Monitoring Centres (FMCs), fisheries observer agencies, Maritime Fusion Centres, law enforcement agencies, fisheries development institutes, research and academia, fishing industry, private sector, and non-state actors within each SADC Member State, as well as regional and sub-regional fisheries organisations.

The governance structure of MCSCC in terms of Article 10 of the Charter consists of the following institutions responsible for the direction and implementation of the Charter for the MCSCC:

1. The Committee of Ministers responsible for Fisheries (COM), which is established through Article 12 of the SADC Treaty (1992 as amended) and discharges its mandate on the MCSCC in terms of Article 12 of the Charter.
2. The Technical Committee (TC), which is established in terms of Article 19 of the SADC Protocol on Fisheries (2001). In terms of Article 13 of the Charter, TC is recognized as a technical advisory committee to the Committee of Ministers on matters pertaining to MCSCC.
3. The Board of Directors (BOD), which shall be established in terms of Article 14 of the Charter, and discharge its responsibilities in terms of Article 15 of the Charter and;
4. The MCSCC Secretariat, which shall be established in terms of Article 17 of the Charter and discharge its responsibilities in terms of Article 18 of the Charter.

5.3 Success Factors towards implementation of the SADC MCSCC

The Statement of Commitment was signed by SADC Member States in July 2008, to fight against IUU fishing, emphasizing the need to strengthen regional and inter-regional cooperation for effective fisheries governance and to enhance regional MCS capacities. This commitment is crucial for the successful implementation of the MCSCC.

The commitment also ensures the sustainability of the MCSCC as Member States committed to providing resources to support the Centre, demonstrating their ownership and recognition of the benefits of reducing IUU fishing. In 2017, the SADC Council of Ministers approved an initial annual contribution of at least US $10,000, which can be reviewed by the Ministers. This contribution will be channeled into the Reserve Fund for the MCSCC which called for strengthening the efforts to improve regional and inter-regional cooperation for fisheries governance and to reinforce MCS capacities at the regional level, remains a key factor for the successful implementation of the MCSCC. The Statement provides the grounds for the self-sustainability of the MCSCC in that Member States committed to providing resources to ensure ownership and sustainability of the process, as they appreciated the cost-benefits that will be gained from reducing IUU fishing. In 2017, the SADC Council of Ministers approved an initial contribution of US10,000 per annum minimum contribution, which Ministers can review. Thus, this amount will form part of the Reserve Fund for the MCSCC.

One crucial aspect of the success of the SADC MCSCC is its integration into the broader regional and continental framework, such as the African Union (AU) and other relevant political contexts. This integration includes collaboration with existing regional MCS or IUU fishing policy initiatives and practical arrangements. The involvement of regional organizations in the establishment of the MCSCC is significant as it promotes the sharing of experiences, potential financial contributions for the Centre's establishment, and opportunities for future collaboration in terms of information exchange and networking. This collaboration is mutually beneficial for all parties involved.

While the penultimate goal of the MCSCC is to achieve financial self-sustainability, its initial establishment relies on donor support. Donor assistance may also be necessary in the long term for special projects conceived and implemented by the Centre. Fortunately, there are various Programs, Partners, and Donors operating in the region who have expressed interest in supporting or have already pledged funds for the establishment of the MCSCC. For instance, the World Bank has committed to providing funding to the Government of Mozambique for the construction of the Centre. Additionally, the African Union, through its technical agency, the AU-IBAR), has pledged institutional support, capacity-building programs, and equipment to aid the MCSCC.

5.4 General Cost Estimates for the MCSCC

The capital costs for establishing the MCSCC are estimated at US$2.65 million as detailed in Table 5 below. The main cost item is the building, with a total amount of US$2.5 million, thus representing 94.3% of the budget. The cost estimate for this item was provided by the Ministry of Seas, Inland Waters and Fisheries (MIMAIP) of Mozambique in 2017, and it is part of the Mozambique component in the World Bank-funded SWIOFISH 1 regional project. The remaining 5.7% of the capital cost budget is part of the estimates for equipment.

Table 5: *Capital Costs: Secretariat*

Item	Quantity	Unit Cost (US$)	Total Cost (US$)	Comments
Building	1	2,500,000	2,500,000	US$1,500,00 has been contributed by World Bank.
Vehicle	2	40,000	80,000	
IT Equipment	10	1,500	15,000	Purchased through support by Bloomberg Philanthropies
General IT Equipment/Communications	1	40,000	40,000	
Furniture	10	1,000	10,000	
General Office Equipment	1	5,000	5,000	
Total			2,650,000	

Source: SADC Secretariat

The general picture of the annual recurrent costs for the MCSCC is given in Table 6 below, which amounts to approximately US$1.0 million/year and represents the financial impact of the normal functioning of the Centre once it is fully established and performing its core activities. Assuming that for the other activities to be undertaken by the Centre within the scope of its mission, the cost implication and likely revenues will be duly budgeted for when the Centre becomes ready to phase them in. This can be expected to occur from year 4 onwards, after the three-year interim phase, when all the Secretariat staff will be in place and replacing the Interim Project Management Unit (IPMU) staff, currently seconded by the Government of Mozambique until the appointment of MCSCC Secretariat staff. The Government is also providing office space housing the MCSCC in the interim, which consists of an operations room and an administrative room. However, the cost implications are not reflected in Table 6.

The cost estimates summarized in Table 6 are based on the estimates made in 2012 when the Guidelines for the establishment of the MCSCC were developed and adopted by Member States.

Table 6: *General Operating Cost Estimates*

Item	Total Costs (US$)	Comments
Staff Costs	677,600	
Running Costs	121,800	This cost will increase once the full Secretariat is established, and all services are in place
Governance Costs	200,000	These are urgent for now as there is a need to establish a functional Board of Directors
Total Costs	999,400	

Source: SADC Secretariat

Recognizing the significant losses of approximately US$400 million per year in the SADC region caused by IUU fishing activities, as well as the negative impacts on overfishing and marine ecosystems, it is anticipated that the MCSCC will prove to be a cost-effective solution. However, a comprehensive assessment of its effectiveness can only be conducted once the Centre is established and operational to accurately determine its impact on reducing these losses.

5.4.1 Potential Mechanisms for Funding MCSCC

Based on the conviction that MCS programs should be self-sufficient and in accordance with the SADC Member States' commitment to providing resources for ownership and sustainability, the following scenarios suggest potential sources of ongoing revenue. To prioritize the interim phase, Member States'

contributions could be based on catch scales, and fees for clearance certificates could be determined by the Fishing Vessel Register (FVR). Examples from organizations like IOTC and other Regional Fisheries Management Organisations (RFMOs) that use policies to determine Member States' contribution scales can be considered.

Other potential sources of sustainable revenues which can be considered include*:*

i. Factoring in of possible contributions from non-SADC countries –

Other African countries that are not in SADC but are important neighbours for fisheries issues due to migrating fleets and other processes, namely, Kenya, Somalia and La Reunion may be considered in the longer run. Any eastern Africa country that has shown interest in fishing in SADC waters, as well as being agreed upon the AU-IBAR, can also be seen as a potential source of income.

ii. Regional VMS Fee

Considering that the private sector already pays VMS fees to local FMCs, implementing a regional VMS fee may duplicate the national VMS system. However, this fee can be considered at a later stage once a comprehensive study of its implications has been conducted.

iii. Fisheries Observer Fee

The fee for fisheries observers can be considered as another potential revenue source in the later stages when the Center is ready to provide the Regional Fishery Observer Coordination service. It is crucial to determine whether this fee will also be applicable to the national fleets of Member States.

iv. Alternative revenue streams

In the longer term, the Center can consider generating revenue through various sources, such as providing advisory and capacity-building services to State Parties, including training fisheries observers, and offering technical expertise to develop national MCS policies, strategies, and legislation. Another potential revenue stream could come from charging fees for requests for information by the private sector.

v. Resource mobilization

The Center should have a dynamic resource mobilization strategy, including partnership coordination, to ensure continuous funding for important development projects and add to the sustainability of the Center.

The proposed integration of the SADC MCSCC into the wider framework of the African Union (AU), NEPAD, and other political contexts, as well as the integration with other regional MCS or IUU fishing policy or practical arrangements, is an important success factor for the center. This factor is significant because it allows for the engagement of regional organisations in the establishment process, enabling experience sharing, possible financial contributions for setting up the center, and potential collaboration for future information exchange and networking, benefiting all parties involved.

5.5 The integration of the SADC MCSCC into the African Union (AU-IBAR) framework can provide several benefits for the Centre

a. Political Support

Being part of the AU framework can enhance the political support for the MCSCC. The AU has a strong emphasis on regional cooperation and can advocate for the MCSC's objectives and initiatives at a higher level, increasing its visibility and influence.

b. Resource Mobilization

The AU can assist in mobilizing resources for the MCSCC. As a continental body, the AU has access to various funding mechanisms, partnerships, and donor networks that can help secure financial support for the Centre's establishment and ongoing operations.

c. Collaboration and Networking

Integration with the AU enables the MCSCC to collaborate with other AU member states and regional organizations that are working towards similar goals. This collaboration can facilitate the sharing of best practices, technical expertise, and information exchange, strengthening the MCSC's capacity to combat IUU fishing effectively.

d. Policy Harmonization

The AU provides a platform for policy harmonization and coordination among its member states. By aligning the MCSC's strategies and initiatives with AU frameworks and guidelines, the Centre can contribute to a more cohesive and consistent regional approach to combat IUU fishing and promote sustainable fisheries management.

e. Capacity Building and Training

The AU, through its technical agency AU-IBAR, can support the MCSCC in terms of capacity building, training programs, and access to relevant expertise. This assistance can enhance the skills and knowledge of the MCSCC staff and stakeholders, improving their ability to implement effective MCS measures.

Overall, integration into the AU framework offers the SADC MCSCC a broader platform for collaboration, resource mobilization, and policy coordination, ultimately strengthening its ability to combat IUU fishing and promote sustainable fisheries management in the region. The AU-IBAR can provide valuable support and assistance to the SADC MCSCC in capacity building in several ways:

f. Training Programs

AU-IBAR can develop and deliver training programs tailored to the specific needs of the MCSCC. These programs can cover various aspects of MCS , such as data analysis, surveillance techniques, vessel monitoring systems, legal frameworks, and enforcement protocols. The training can be conducted through workshops, seminars, webinars, or any other suitable format.

g. Technical Expertise

AU-IBAR can provide access to technical experts who specialize in MCS and related fields. These experts can offer guidance, advice, and support to the MCSCC staff and stakeholders, helping them build their capacity and develop effective strategies to combat IUU fishing.

h. Knowledge Sharing

AU-IBAR can facilitate the sharing of best practices and lessons learned from other MCS projects and initiatives across the continent. This knowledge sharing can help the MCSCC benefit from the experiences of other countries and regions, avoiding potential pitfalls and implementing innovative approaches based on successful models.

i. Networking and Partnerships

AU-IBAR can assist the MCSCC in establishing partnerships and networks with other regional and continental organizations working on MCS and IUU fishing. This collaboration can provide opportunities for information exchange, joint initiatives, and collective efforts to combat IUU fishing in a coordinated and efficient manner.

j. Technical Resources and Tools

AU-IBAR can support the MCSCC in accessing relevant technical resources and tools required for effective MCS operations. This can include software, equipment, databases, and other technological solutions that enhance the Centre's capabilities in monitoring and surveillance activities.

The regional MCS Centre will fall within the context of the wider continental framework of the AU. By leveraging the expertise and resources of AU-IBAR, the SADC MCSCC can significantly enhance its capacity in MCS, contribute to regional cooperation, and promote sustainable fisheries management in the ESA region.

6. Conclusion

In order to promote regional sustainable blue growth, it is crucial to have collaborative efforts on fisheries MCS, maritime security, and the connection between regional initiatives like the AU-IBAR IOC□PRSP, SADC MCSCC, and the IOC□MASE program. These partnerships will not only deliver significant advantages but also foster much-needed investment and development in the fisheries sector. By tackling issues such as corruption and criminal activities that create uncertainty and hinder proper business practices, we can establish a fair and equitable playing field for regional sustainable blue growth. The Protocol on Fisheries (2001) recognizes RFBAs and RFMOs as Appendix 2 organizations, and this requires closer collaboration between these organisations and SADC. Through the Memorandum of Agreement with Food and Agriculture Organisation of the United Nations (FAO), SADC collaborates with the South West Indian Ocean Fisheries Commission (SWIOFC), which is an RFBA in the Indian Ocean. Majority of State Parties to the SWIOFC Agreement are Members of SADC, and these includes Comoros, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and the United Republic of Tanzania. The role that SWIOFC is playing towards implementation of the Protocol is very important, hence a need to strengthen relations between the two organizations.

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