



**A FRAMEWORK FOR ESTABLISHING INNOVATIVE,
COST-EFFECTIVE FINANCIAL MECHANISMS
(FUNDING SYSTEMS) FOR SUSTAINABLE
MONITORING, CONTROL, SURVEILLANCE (MCS), AND
ENFORCEMENT SYSTEMS FOR THE CONSERVATION
OF AQUATIC BIODIVERSITY AND ENVIRONMENTAL
PROTECTION IN SHARED AFRICAN AQUATIC
ECOSYSTEMS**



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TABLE OF CONTENTS

1.	ACTIVE INNOVATIVE REGIONAL MCS FINANCING IN EAST AFRICA	1
1.1	<i>Background</i>	1
1.2	<i>Rationale of the Current AU-IBAR Project:</i>	2
1.3	<i>Objective of the Consultancy:</i>	3
1.4	<i>Consultancy Methodology used</i>	3
2	AN OVERVIEW OF IUU FISHING AND MCS IN AFRICA	6
2.1	<i>Key Messages on Illegal Unreported and Unregulated Fishing in Africa</i>	6
2.2	<i>Measures, Agreements to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing (PSMA)</i>	6
2.3	<i>An Elaboration of Illegal, Unreported, and Unregulated (IUU) Fishing</i>	6
2.4	<i>Gaps and Weaknesses in Fisheries Governance in Africa</i>	10
2.5	<i>The economic losses caused by IUU fishing</i>	12
2.6	<i>Monitoring, Control, and Surveillance (MCS)</i>	12
2.7	<i>Observer Programs</i>	16
3	INTERNATIONAL LEGAL FRAMEWORKS ON FISHERIES MCS	18
3.1	<i>Global Fisheries Instruments with MCS-related Provisions</i>	18
3.2.	<i>A Summary of Legal Requirements</i>	21
3.3	<i>Global Cooperation on MCS to Combat IUU Fishing</i>	29
4	REGIONAL COOPERATION AND FRAMEWORKS ON FISHERIES MCS	30
4.1	<i>Regional Requirements on MCS</i>	30
4.2	<i>Combating IUU acting through Relevant RFMOs</i>	31
4.3	<i>Fisheries Framework for the African Region</i>	32
4.4	<i>MCS Capability and Relevance to Regional Organizations and Arrangements</i>	33
4.5	<i>Other Regional MCS Initiatives</i>	36
4.6	<i>Regional Cooperation in Fisheries</i>	40
4.7	<i>Bilateral Cooperation and Fisheries Partnership Agreements</i>	41
5	NATIONAL/DOMESTIC FRAMEWORKS FOR MCS SYSTEMS	42
5.1	<i>Report on MCS Systems in Eastern African Countries</i>	42
5.2	<i>SWOT Analysis of the National MCS Systems: Institutional and Practical Challenges</i>	51
6.	RECOMMENDATIONS FOR THE ESTABLISHMENT OF REGIONAL MCS	56
6.1.	<i>Model Legislation on Fisheries and Sample MCS Regulations</i>	56
6.2	<i>Regional Sharing of Information</i>	57
6.3	<i>Financial Support of Regional or Sub-regional MCS</i>	58
6.4	<i>Training and Professional Development</i>	58

7.	THE COST OF MANAGING FISHERIES RESOURCES	59
7.1	<i>Identified Items to be costed for an Effective MCS System</i>	59
8	FINANCING OF MCS OPERATIONS	63
8.1.	<i>Estimated the Cost for putting up the Basic MCS Facilities and Operations - Kenya</i>	63
8.2	<i>Government Funding of Fisheries Activities</i>	64
8.3	<i>Revenue from Distant Water Fishing Nations</i>	64
8.4	<i>Financing Fisheries Management Costs through Fisheries Partnership Agreements</i>	64
8.5	<i>Estimated Costs of Requirements for MCS</i>	67
8.6	<i>An Examination of Fisheries Management Costs</i>	68
8.7	<i>Fisheries Management Expenditures</i>	68
8.8	<i>The fisheries policy function</i>	70
9.	ESTIMATING THE FISHERIES MANAGEMENT COST FUNCTIONS.	71
10.	A FRAMEWORK FOR DEVELOPING A COST EFFECTIVE AND INNOVATIVE FINANCING MECHANISM FOR REGIONAL MCS	72
10.1	<i>Introduction</i>	72
10.2	<i>How the On-going Regional MCS systems are financed</i>	72
10.3	<i>Major Challenges Facing the Establishment of MCS in Africa</i>	75
10.4	<i>Recommendations by the 2050 AIM Strategy to combat IUU Fishing</i>	76
10.5	<i>Priorities areas in Strengthening regional cooperation</i>	77

1. CTIVE INNOVATIVE REGIONAL MCS FINANCING IN EAST AFRICA

1.1 Background

The Africa Blue Economy Strategy (ABES) has been endorsed at the highest political level of the continent. The Strategy incorporates key critical vectors for promoting blue economy development of the continent, 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 Africa Blue Economy Strategy is to guide the development of an inclusive and sustainable blue economy that culminates into 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 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.

The Africa Blue Economy Strategy is consolidated based on the following five thematic areas:

1. Fisheries, aquaculture, conservation, and sustainable aquatic ecosystems;
2. Shipping/transportation, trade, ports, maritime security, safety, and enforcement;
3. Coastal and maritime tourism, climate change, resilience, marine ecosystem, environment, infrastructure;
4. Sustainable energy and mineral resources and innovative industries; and,
5. Policies, institutional and governance, employment, job creation, and poverty eradication, innovative financing.

The African continent is adjacent to highly productive marine ecosystems that include the seven African Large Marine Ecosystems (LMEs) listed below;

- Agulhas Current LME,
- Benguile Current LME,
- Guinea Current LME,
- Canary Current LME,
- Mediterranean Sea LME,
- Red Sea LME, and
- Somali Current LME.

The seas, oceans, lakes, and rivers are domiciled by a significant number of biodiversity and ecosystems that provide sources of livelihoods, food security, and wealth. The African marine ecosystems inhabit living and nonliving resources; nonetheless, the unsustainable exploitation of these resources is threatening biodiversity, resources, and environmental sustainability. Several factors are believed to have contributed to the threats facing aquatic biodiversity and ecosystems in Africa. They include overexploitation of living species and pollution from several sources (land-based municipal and agricultural activities). In addition, dumping of toxic wastes, mining activities, gas exploration, and tourism development among others have

also played some role. Consequently, important aquatic resources are becoming increasingly susceptible to both natural and artificial environmental changes. Thus, conservation strategies to protect and conserve aquatic life are necessary to maintain the balance of nature and support the availability of resources for future generations.

1.2 Rationale of the Current AU-IBAR Project:

The Illegal Unreported, and Unregulated, (IUU) fishing activities in Africa are a major threat to the sustainability of aquatic biodiversity. These include unauthorized fishing in closed areas/seasons, illegal fishing, fishing with forged and fraudulent licenses or vessel registrations, unreported and misreported catches, fishing the Threatened, Endangered and Protected (TEP) species, dumping of toxic wastes, ecosystems, and environmental degradation, pollution among others. Africa's annual share of the global IUU catch has recently been estimated at 4.7 million tons of fish which is conservatively estimated to be worth value of \$10 billion. Weak governance is a major stumbling block responsible for IUU fishing in coastal states.

Weak MCS systems have greatly contributed to the increased incidences of unsustainable practices and a reduction in aquatic biodiversity in African large marine ecosystems and inland waters. In many cases, the present transboundary MCS systems are weak and require institutional strengthening and capacity development. The issue of sustainability is a key challenge in regional efforts to establish and operationalize regional MCS systems in Africa. Many regional MCS Systems have collapsed or their operations can not be sustained due to unsustainable financial mechanisms for them in Africa. At national levels, funding for MCS systems is mainly from public sector annual subvention or budget allocation. Other approaches have been implemented and indeed it can be said that few AU Member States have also tried private sector-led MCS systems,

Effective Monitoring, Control, and Surveillance (MCS) of human activities is crucial for the conservation and sustainable use of aquatic ecosystems, particularly in Africa where highly productive waters foster strong fishing pressure. Several commercially exploited fish species in African Exclusive Economic Zones (EEZs) are either migratory or straddling and most of these species are targeted by illegal fishing vessels. Also, most illegal practices that threaten aquatic biodiversity and environmental management in freshwater and aquatic ecosystems are transboundary in nature. A single-state solution to combating these transboundary illegal practices across Member States' territorial waters has been found to be ineffective.

The Swedish International Development Cooperation Agency (SIDA) project 'Conserving Aquatic Biodiversity in the African Blue Economy' currently being implemented by AU-IBAR, is exploring ways to enhance the conservation and sustainable use of aquatic biodiversity and ecosystems in Africa's coastal waters through enhanced regional governance, including the strengthening of MCS measures.

Although Maintaining effective MCS systems is an expensive exercise nevertheless it is crucial for effective conservation of the fisheries, aquatic biodiversity, and the protection of the environment. However, the existing regional MCS initiatives have been fraught with a number of challenges, among them is a lack of or inadequate funds for sustainable funding for operations of the regional MCS Units or Command Centres. Regional MCS systems have been established mainly through regional cooperation agreements among

AU member states sharing or adjacent to the aquatic ecosystems; marine or freshwater. The main funding sources have usually come from contributions or subscriptions by the AU Member States to the regional entities (e.g., Regional Fisheries Organizations, Water Basin Authorities) overseeing the operations of the regional MCS centers. Complementary funding sources, though not regular, have also come from fines imposed on vessels engaged in infractions of EEZs rules and regulations for the ones who are caught and prosecuted.

The fisheries management systems in Africa, require a serious assessment of financing mechanisms for the same MCS systems. This exercise will assist in identifying lessons and best practices necessary to propose a framework for establishing sustainable financing mechanisms. Such mechanisms are useful for regional MCS systems because they will ensure effective financial commitment for the protection of fish resources, aquatic biodiversity, and ecosystems in African territorial waters.

To actualize the above aim, AU-IBAR supported by SIDA is implementing a project “Conservation of aquatic biodiversity under the Africa Blue Economy Strategy” and one of the components of this project will be applied to strengthen Sustainable MCS Systems for the effective conservation and protection of biodiversity.

1.3 Objective of the Consultancy:

The overall objective of this consultancy is to conduct a review of existing financial mechanisms for Monitoring, Control, and Surveillance (MCS) systems in the African shared aquatic ecosystems (marine ecosystems and freshwater ecosystems) at national and regional levels with the aim of developing a framework for establishing innovative cost-effective financing systems or mechanisms for sustainable and functional regional MCS systems,

1.4 Consultancy Methodology used

This study was undertaken to develop a framework for establishing innovative, Cost-Effective Financial Mechanisms (Funding Systems) for sustainable monitoring, control, surveillance (MCS), and enforcement systems for the conservation of aquatic biodiversity and environmental protection in shared African aquatic ecosystems. This particular study focused on the South and East regions of Africa for AU MS in the SADC REC and it included other countries riparian to the South West Indian Ocean within the same region.

The study was to;

- i. Identify a list of existing or ongoing transboundary (regional) MCS initiatives in shared aquatic ecosystems, existing protocols, and sources of funding for the initiatives;
- ii. Outline of lessons and best practices for sustainable, cost-effective financial mechanisms for functional MCS regional systems in shared aquatic ecosystems in Africa;
- iii. Identify challenges, weaknesses, or gaps in the regional institutional arrangements or protocols amongst cooperating African Union Member States for funding MCS regional initiatives;
- iv. Develop a framework for cost-effective and innovative sustainable financing mechanisms for functioning regional MCS systems or initiatives developed;

- v. Propose a funding mechanism for integrated aquatic biodiversity conservation and environmental management in fisheries-based regional MCS initiatives;
- vi. Prepare a comprehensive report of the consultancy developed and approved

The key outputs of the study were in six result areas, and for each, an Annex containing a brief on thematic areas have been prepared and attached to this document. The annexes are on the existing or ongoing transboundary MCS, lessons and best practices for sustainable, cost-effective financial mechanisms for functional MCS regional systems, in shared water bodies in the Eastern Western African region, identified challenges weaknesses, or gaps in the regional institutional arrangements, or protocols amongst cooperating AU MS for funding MCS regional initiatives, a proposal on a framework for cost-effective and innovative sustainable financing mechanisms for functional regional MCS systems or initiatives developed. The main focus of the study was to develop a framework for the establishment of innovative cost-effective financial mechanisms (funding systems) for sustainable monitoring control surveillance (MCS), and enforcement systems for the conservation of aquatic biodiversity and environment protection in East and Southern shared aquatic ecosystems. A comprehensive report of the consultancy was to be developed submitted and approved.

The methods used in the study involve the following activities:

- **Literature search on a number of sub-topics on MCS, and the current status of the MCS system, funding arrangements, and reports on appropriate actions taken with regards to the prevention and deterrence of IUU East African region:**

A great deal of work has been done and documented on the promotion of MCS activities at the country, regional and international levels, and a number of policy frameworks and strategies, have been prepared over the last decades, including many that are applicable to developing countries such as those in the SADC. A regional approach and strategy adopted on fisheries by the SADC countries had particular relevance to the objectives of this study.

- **A review of literature on the conservation of aquatic biodiversity and environmental protection in aquatic ecosystems as well as the review of fisheries**

A review was carried out on the conservation of aquatic biodiversity and environmental protection in the aquatic ecosystems, IUU Fisheries, and MCS systems in South and Eastern Africa targeting the AU MS member states. This focused on SADC member countries including the non-member states and works of other RBOs EC as well as Kenya, Uganda, and the IGAD countries. This review aimed at informing the development of a funding mechanism regional MCS strategy for SADC with regard to the impact and the nature of IUU fishing activities and existing MCS capability in the region. This review is summarised given as an Annex

- **A review of the regulatory, institutional, and policy frameworks for fisheries management for Large Marine Ecosystems in the Eastern part of Africa:**

SADC has made a number of policy commitments and pronouncements oriented towards a regional approach to MCS and the regional coordination of activities to combat IUU. In addition, SADC has already signed its regional strategy in the Charter and initiated the development of the MCSCC. The regional

strategy expressed in this document aims to be aligned with and is informed by a strategy framework.

Consultation with stakeholders: The views of stakeholders and members of the AU-IBAR Team tasked with overseeing the execution of the consultancy with the focus and content of regional funding mechanisms and actions to be taken to ensure long-term sustainable funding for functional regional MCS and supported by national MCS. The consultant went for a field visit to IOC Center in Mauritius and held discussions with the Director General of the IOC on the sharing of MCS and IUU information with other countries which border the Indian Ocean. Another visit was made to Maputo in Mozambique to collect factual information on the regional MCS Center being established by SADC. Discussions were also held with the Director of Fisheries Management LVFO to clarify issues of MCS in Lake Victoria. Consider consultations and field trips that were taken to gather information including informal discussions and conference call discussions.

Review and document mechanisms for integrating community-based systems into national and regional MCS; within SADC member states and other countries in East and Southern Africa

Document innovative funding mechanisms of similar MCS systems: A literature search was done to ascertain the kind and types of funding that have taken place and the funding levels, and their sources for (a) the implementation of the priority actions linked to strategic objectives, and (b) for enhanced MCS by SADC member states, as developed and utilized based on different funding mechanisms based on the experience and views from the member states in the East South African region.

A SWOT analysis for the MCS activities was undertaken to provide an analytical position of IUU interventions in the region

2 AN OVERVIEW OF IUU FISHING AND MCS IN AFRICA

In the AU-IBAR, 2018. Policy Note on: Priorities for Strengthening Regional Cooperation in Monitoring, Control and Surveillance for Effective and Strategic Combat of Illegal, Unreported and Unregulated (IUU) Fishing in Africa had key messages on IUU, and measures and agreements to prevent, deter and eliminate IUU fishing in Africa as given below;

2.1 Key Messages on Illegal Unreported and Unregulated Fishing in Africa

- a. Illegal, Unreported, and Unregulated (IUU) fishing is a serious threat to the sustainability of the fisheries resources, livelihoods, and food and nutrition security of AU Member States (AU MS). Fighting against this phenomenon must be a priority by AU MS and integrated into their national regulatory and institutional frameworks
- b. Monitoring, Control, and Surveillance (MCS) is a key component of fisheries management and its effective implementation can serve as both a deterrent and enforcement mechanism to combat IUU fishing
- c. Assessment of the IUU fishing phenomenon in the continent and the status of MCS systems in the regions including an assessment of the strengths and weaknesses of these systems revealed seven priority thematic areas to invest in to strengthen regional cooperation in MCS to combat IUU fishing
- d. Regional training programs on Needs Assessment on the implementation of Port State.

2.2 Measures, Agreements to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing (PSMA)

1. Comprehensive review of national legislation and regulations in the regions.
2. Improvement in data collection and sharing.
3. Strengthen ongoing Regional Observer Programs and develop others, as appropriate.
4. Promote the involvement of regional and multilateral organizations.
5. Strengthen ongoing regional MCS systems and establish others, as appropriate.
6. Regional capacity building in a number of key aspects of MCS.
7. Community Involvement in MCS activities locally

2.3 An Elaboration of Illegal, Unreported, and Unregulated (IUU) Fishing

Illegal, unreported, and unregulated (IUU) fishing is a global phenomenon that threatens ocean ecosystems and sustainable fisheries. IUU fishing activities violate both national and international fishing regulations. It threatens national economies and the natural resources that are critical to global food security, and it puts law-abiding fishers and producers at a disadvantage.

Illegal fishing is a problem in every ocean, but it disproportionately affects Africa due to countries' under-enforcement of the law, limited capacity in fisheries management, inadequate awareness of the costs of the exploitation, and misgovernance implicating both African countries and foreign fishing partners; all of which inhibit aggressive action. Some of the leading hot spots for IUU fishing are the Western Indian Ocean and West Africa.

Illegal, unreported, and unregulated fishing is currently the single most important issue in African fisheries because of its significant socio-economic, political, and environmental long-term impacts and in East and Southern Africa the problem of piracy and terrorism should be considered in the case of the Somali case due to reach fishery brought about by the Somali current.

2.3.1 Terminologies used in IUU Fishing

Illegal fishing refers to fishing activities conducted in contravention of applicable laws and regulations, including those laws and rules adopted at the regional and international level.

Unreported fishing refers to fishing activities that are not reported or are misreported to relevant authorities in contravention of national laws and regulations or reporting procedures of a relevant regional fisheries management organization (RFMO)

Unregulated fishing occurs in areas or for fish stocks for which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law. Fishing activities are also unregulated when occurring in an RFMO-managed area and conducted by vessels without nationality or by those flying a flag of a State or fishing entity that is not a party to the RFMO in a manner that is inconsistent with the conservation measures of that RFMO

Source: FAO. 2001. International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated Fishing. Rome. 24 pp

2.3.2 Examples of IUU fishing

IUU fishing in Africa covers a wide range of offenses that include: fishing without a license or quota for certain species, fishing in closed or protected areas, or during closed seasons, catching beyond authorized limits; failing to report catches, or making false reports (to both the coastal State and RFMO), using prohibited fishing gear, under-reporting of the size of the vessel, fishing with forged and fraudulent licenses or vessel registrations and fishing threatened, endangered and protected (TEP) species.

There are additional trade-related offenses such as unloading catches in non-designated ports or conducting unauthorized transshipments (e.g., transfers of fish) to cargo vessels as well as fishing without an observer on board (if so, mandated by regulations), and failing to operate a vessel monitoring system.

The problem of fishing without a licensee has often reached dramatic levels in countries experiencing armed conflicts, where fishing authorities are barely functioning. Fishing vessels operating in the area have paid substantial sums to various warlords for protection from piracy. These funds are thought to have contributed to the escalating piracy as well as the worsening of the armed conflicts. The practice of unlicensed fishing has also led to collusion with small-scale fishers in some countries. While unlicensed vessels are an issue, the greatest concern is licensed vessels involved in under-reporting catches and the use of banned fishing methods.

2.3.3 The Impact of IUU Fishing in Africa

Illegal fishers are cheating coastal communities that depend on fish for sustenance and income. They undermine law-abiding commercial fishers, skew scientific assessments of the fisheries, and destroy the environment. Illegal fishers are also organized criminals. IUU fishing poses a direct threat to food security and socioeconomic stability in many countries.

IUU fishing reduces the contribution of EEZ or high seas fisheries to the national economy in terms of employment from local and locally based foreign fleets and leads to loss of potential resource rent. IUU fishing in the EEZ reduces local landings and means non-payment of access dues which will in turn impact actual and potential export earnings. This also has implications for surveillance services in countries where the activities are supported wholly or partly by export revenues.

The environmental impacts of IUU fishing include stock status impacts and impacts on threatened, endangered, and protected (TEP) species, habitat degradation, and impact on ecosystem services (e.g. loss of inshore prawn fishing areas, damage to mangrove areas, spawning and breeding areas) and biodiversity. This will lead to a reduction in income for coastal fishing communities. The decline in fish availability in local markets may also reduce protein availability and national food security. This may increase the risk of malnutrition in some communities, which are heavily dependent on fish as a source of animal protein.

IUU fishing also results in conflicts between artisanal and commercial fishers when industrial fishing vessels (legal and illegal) encroach on areas reserved for smaller vessels or designated as small-scale fishing grounds with both licensed and unlicensed fishing vessels using prohibited fishing gears, equipment, and methods. When this IUU fishing depletes fish stocks and forces regulators to reduce catch limits, legitimate fishers who follow the rules designed to preserve the health of the marine environment bear the burden.

Misreporting of vessel size particularly bottom trawlers which fish in areas reserved for smaller vessels has the most devastating impact on coastal communities. This not only destroys spawning and breeding areas, but undermines the availability of fish, and often damages local vessels and fishing gear.

Many crew members on IUU fishing vessels are from African countries and they often work in unsafe conditions in gross violation of workers' rights onboard vessels. Further, illegal vessel operators have forged and altered licenses and other required documentation as a cover to fish illegally. According to the United Nations Office on Drugs and Crime (UNODC), illegal fishing also is linked to transnational organized crime, including human trafficking, often for forced labour on fishing vessels and drugs and arms smuggling.

The African Union 2050 Africa's Integrated Maritime Strategy (2050 AIM Strategy), does encourage all Member States to report any IUU fishing activity to the AU for supplementary stringent dissuasive actions through all available channels deemed appropriate.

2.3.4 Illegal, Unreported and Unregulated (IUU) Fishing in East Africa

The marine eco-region of East Africa covers more than 480,000 square kilometers and extends 4,600 kilometers along the continent's eastern coast. If the coast of South Africa is included, this totals more than 7,200 kilometers. In the Eastern African sub-region, almost 90 percent of the fish produced come from freshwater sources while the remaining 10 percent comprises marine capture from the vast marine areas of the Indian Ocean. In addition to the tuna resources, the coast of East Africa is home to rich biodiversity, including 3,000 species of molluscs, 1,500 species of fish, 1,000 species of seaweed, 300 species of crabs, 200 coral species, 100 species of cucumbers, 50 species of starfish, and 35 species of marine mammals. Fishing is the main large-scale commercial activity in the region which accounts for a large portion of foreign exchange earnings.

Increased pressure on resources is a significant threat to the ecological sustainability of East African marine and coastal areas. A number of factors have contributed to this pressure such as population growth, industrialization of the fishing sector, overfishing, climate change and other environmental factors, open access fisheries, overcapacity in the fishing fleet, subsidies, ineffective data collection systems, unsustainable fishing practices, lack of effective fisheries management, compliance and enforcement, and weak MCS.

It is estimated that IUU fishing accounts for almost one third of total catches in some important fisheries and may represent an overall cost to developing countries of between USD2 to USD15 billion a year. In the EEZ of African States, IUU fishing results in an annual loss estimated between USD 2 to USD 5 billion of potential wealth. About 25 to 30 per cent of the global fish catch is considered unreported. The degree of under-reporting of fish catch can be up to 75 per cent in regional areas, while on the high seas it may be 100 per cent. As an example, at the national level, it has been reported that under-reporting of fish catch can be as high as 50 per cent in Kenya and even 75 per cent within the shrimp fishery in Mozambique. In 2004 alone, the estimated unreported catch of toothfish derived from landings in South Africa and Mauritius ports was estimated to be 74,000 to 82,200 tonnes. Studies estimate that the total loss to IUU fishing in some African countries including Mozambique, Kenya, and the Seychelles amount to USD372 million or 19 percent of the total value of the catch.

IUU fishing is known to have inter-related negative economic, environmental, ecological, and social impacts. Regarding economic impacts, IUU fishing reduces the contribution of EEZ or high seas fisheries to the national economy in terms of employment from local and locally based foreign fleets and leads to loss of potential resource rent. This is likely to be a major factor in respect of IUU fishing in the EEZ by reducing local landings and non-payment for access dues which will in turn impact actual and potential export earnings. This also has implications for surveillance services which are supported wholly or partly by export revenues, as well as puts budget pressures on MCS and fisheries management.

The destruction of ecosystems is one of the main ecological impacts of IUU fishing, resulting in loss of ecosystem service value from coastal areas, e.g., inshore prawn fishing areas, non- and damage to mangrove areas. This will lead to a reduction in income for coastal fishing communities. The decline in fish availability in local markets may also reduce protein availability and national food security. This may increase the risk of malnutrition in some communities, which is some of the key social impacts resulting from IUU fishing.

This is particularly important as many coastal communities in Eastern Africa are heavily dependent on fish as a source of animal protein.

IUU fishing also results in conflicts between artisanal and commercial fishers. It has been reported that in Madagascar, industrial fishing vessels (legal and illegal) often encroach on small scale fishing grounds with both licensed and unlicensed fishing vessels using prohibited fishing gears, equipment, and methods. This conflict also occurs in the shrimp fishery in Mozambique. Furthermore, there are reported incidences of armed resistance to surveillance and enforcement operations in Somali waters. This practice has been known to extend to Mozambique, leading to armed conflicts and greatly increasing the difficulty of pursuing an effective MCS system in the country. IUU fishing further undermines the rule of law in East African States due to poor governance structures and law enforcement, and can also have an effect on gender issues in regards to onshore fishing by women who in many societies have an important role in fish processing and marketing. IUU fishing may also lead to lower employment if it has a negative impact on stocks which may lead to a reduction in household incomes and therefore exacerbate poverty

IUU fishing has a negative environmental impact on both target and associated species. Underreporting of catch, especially by distant water fishing nations in the EEZ can severely compromise scientific stock assessments. The exploitation of fisheries also has an effect on associated fish populations as the removal of target species (or bycatch species) causes a change in the trophic functioning of an ecosystem. Additionally, destructive fishing practices which may be used by IUU vessels destroy habitats and may have far-reaching impacts on many sensitive habitats such as inshore shallow seas, and coral and seagrass beds, which act as nursery and settlement areas for other marine animals including juvenile fish. IUU fishers may also use their activities as a chance to dump waste, especially toxic waste in the sea

2.4 Gaps and Weaknesses in Fisheries Governance in Africa

Illegal fishers are exploiting gaps and weaknesses in African fisheries management systems and governance; such as poor communication between coastal states and regional fishery bodies; under-resourced enforcement patrols, loose controls of many ports, inadequate information sharing systems; etc. to perpetrate their fraudulent activities. These weaknesses are expanded on below:

Lack of/weak Monitoring, control, and surveillance systems: A major challenge in addressing IUU fishing is the limited capacity to manage a vast expanse of water. In Africa, the lack of sufficient enforcement capabilities also hinders the monitoring of fishing operations. The situation in the continent is aggravated by ineffective observer programs for monitoring the fishing activities of licensed vessels, poor logistics for offshore fisheries surveillance, weak systems for vessel registration and licensing, and a lack of effective regional collaboration for the MCS systems. These gaps have considerably weakened the capacity of the African Continent to fully realize the socio-economic benefits associated with the rational exploitation of its marine fisheries resources.

Lack of sufficient resources: Most countries have insufficient resources to spend on at-sea monitoring, control, and surveillance, leaving most of their Exclusive Economic Zone (EEZ), which extends 200 nautical miles from the shoreline, open to these unscrupulous operators. In the high seas, that is, in waters

beyond national jurisdiction, for the most part, the area of competence of regional fisheries management organizations (RFMOs), these irresponsible operators still cheat.

Regional fisheries management organizations have set quotas for high-seas species such as tuna. Since only countries that are members of the RFMOs are bound by the rules, vessels registered, or flagged, in non-member countries are free to ignore the rules and fish. Further, if owners of vessels registered to a member country do not want to abide by an RFMO's quota, they can simply reflag their vessel to a non-member state and fish at will.

Low flag State performance: Some irresponsible flag States do not respect their commitments. Vessel owners are not required to reveal information about themselves or their vessels' history before reflagging their vessels. So, owners can always change the name and registered owner of a boat to avoid enforcement. In such situations, there is very little coastal countries and fisheries regulators can do even if they have plenty of evidence against a suspected illegal fisher.

Insufficient port State control: Ports known for lax enforcement or limited inspections are prime spots for IUU fishers to move their ill-gotten catch to market. The Port State Measures Agreement to Prevent, Deter and Eliminate illegal, unreported and unregulated (IUU) fishing (PSMA) which came into force in 2016, require parties to exert greater port controls on foreign flagged vessels and as a result keep IUU catch out of the world's market, removing some of the incentives for dishonest fishing operators to continue their illegal activities. Among other things, States enforcing the Agreement would refuse entry or access to port services, including landing and shipment of fish, to foreign flagged vessels known to have engaged in IUU fishing.

Absence of transparency: Transparency is a key tool for combating IUU fishing. However, currently there is no comprehensive overview of which vessels and/or operators have been engaged in IUU fishing. And even where such list exists, it is not generally shared. Further, fishing agreements are frequently opaque, keeping basic information from public view, such as who is allowed to fish, how much they pay and what they catch. Some distant water fleets, which have authority to fish under foreign access arrangement, are known to be involved in IUU fishing.

Inadequate penalty regime: A more rigorous penalty regime is critical to effectively combat IUU fishing. Applying sanctions of sufficient severity to act as a deterrence to IUU activities is a clearly recognized need in the International Plan of Action (IPOA) on IUU Fishing and a requirement in international law insofar as fisheries on straddling and highly migratory fish stocks are concerned. However, many African countries are not effectively implementing the relevant international fisheries instruments, such as the United Nations Convention on the Law of the Sea (UNCLOS), the UN Fish Stocks Agreement, FAO Compliance Agreement, Port State Measures Agreement (PSMA), or the Guidelines on port State performance.

These gaps have considerably weakened the capacity of the African Continent to fully realize the socioeconomic benefits associated with rational exploitation of its marine fisheries resources.

2.5 *The economic losses caused by IUU fishing*

The inherent nature of illegal, unreported, and unregulated fishing, the scope of the offenses, the range of actors involved, and the difficulties of detection, make it difficult to accurately quantify the full global/regional economic impacts resulting from these activities. But there is little disagreement that it is in the billions, or even tens of billions, of dollars each year.

Various studies over the years have assessed regional levels of IUU fishing and estimated global losses, but such estimates are based on data that are now many years old and even notoriously unreliable. Nonetheless, in the EEZ of African States, IUU fishing results in an annual loss estimated between USD 2 to USD 5 billion of potential wealth. About 25 to 30 percent of the global fish catch is considered unreported. The United Nations Food and Agricultural Organization (FAO) is currently developing regional IUU estimate methodologies that can be regularly updated.

2.6 *Monitoring, Control, and Surveillance (MCS)*

An effective MCS is considered the best method of preventing, deterring, and eliminating IUU fishing, and is recognized as one of the key principles of fisheries management both in areas under national jurisdiction and the high seas.

Of late MCS has been recognized as an integral part of fisheries management and not merely a police function to punish lawbreakers. MCS is not only a necessary to protect fisheries from IUU fishing, but also provides necessary biological, economic, and social information for management and as a means to provide a backbone to management implementation. Without MCS, there will be no certainty that pre-determined management objectives will be realized.

2.6.1 *The three components of MCS explained.*

Monitoring - the continuous requirement for the measurement of fishing effort characteristics and resource yields;

Control - the regulatory conditions under which the exploitation of the resource may be conducted; and

Surveillance - the degree and types of observations required to maintain compliance with the regulatory controls imposed on fishing activities

The three components of MCS suggest that it is not just limited to policing or fisheries enforcement but involves a range of measures that takes into account a legal framework, data collection and analysis, and surveillance and patrol systems that would help ensure compliance in fisheries.

2.6.2 *Parallel approaches to effective MCS:*

There are two parallel approaches to effective MCS – one is the preventive approach of compliance measures, and the other is the deterrent or enforcement approach.

The first approach includes enhancement of community/ fisher awareness and understanding of management and MCS through seminars, public awareness, and information, education, and communication campaign; participatory management development to promote ownership of the management regime and input into the regulatory/control aspect of management, in preparation for acceptance by the fishers of their joint “stewardship” role for the management of their fisheries in partnership with government.

The second, the deterrent/enforcement approach seeks to ensure compliance by fishers who resist the regulatory regime. This approach includes inspection, investigation, prevention, and court proceedings to enforce the law. It is a necessary complementary approach to the voluntary approach, which would fail if stakeholders see non-compliant fishers successfully evading the law and receiving economic returns from their illegal activity, at the expense of the fishers who comply.

2.6.3 Spatial Components of MCS:

MCS has three spatial components: land, sea, and air. The land component of an MCS system serves as the base of operations and the coordinating center for all MCS activities from which governments can regulate the deployment of resources to best address changing situations. It is the sector responsible for port inspections and the monitoring of transshipments and trade in fish products to ensure compliance with fisheries legislation.

The sea component includes MCS activities undertaken in marine areas under the jurisdiction of a State and may also cover high seas areas. The technology involved in the sea component of MCS includes radar, sonar, and vessel platforms.

The air component of MCS is usually the first level of response to a coastal State or region of concern and covers the air and space equipment such as aircraft and satellites used in MCS activities. The flexibility, speed, and deterrence of air surveillance make it a very useful and sometimes cost-effective tool for fisheries management.

2.6.4 MCS tools for management:

Key tools for MCS as the executive arm of fisheries management include:

1. an appropriate participatory management plan developed with stakeholder input;
2. enforceable legislation and control mechanisms (Licenses etc.);
3. data collection systems – dockside monitoring, observers, sea and port inspections, etc.;
4. supporting communications system;
5. patrol vessels capable of extended operations to remain at sea with the fishing fleets;
6. aircraft available for rapid deployment to efficiently search large areas;
7. use, where appropriate, of new technology (VMS, satellite, video, infra-red tracking, etc.);
8. linked, land-based monitoring;
9. support of the industry and fishers;
10. bilateral, sub-regional, and regional cooperation with other MCS components; and
11. professional staff.

2.6.5 Basic infrastructure for MCS:

The basic infrastructure required should consist of at least the following:

- A national headquarters for the coordination of fisheries operations with a network of linked field offices.
- A central operations room where the current status of fishing operations can be shown.
- A communications system to all fisheries centers and mobile platforms in the field for both safety and control of operations.
- A computer data system for licensing and vessel registration, data collection, and analysis

2.6.6 Legal Basis for MCS:

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, the UN Fish Stocks Agreement, FAO Compliance Agreement, the FAO Port State Measures 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 and Unregulated Fishing (IPOA-IUU). 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, a record of fishing vessels, vessel monitoring system, observer programs, boarding and inspection regimes, port State measures, and catch certification

It is necessary to legitimize MCS at the national level and through, a Memorandum of Understanding or other administrative processes among participating States at the regional level.

MCS Toolkit: The conventional means of MCS include the use of patrol vessels, aerial patrols, and observers on board fishing vessels. In the last two decades, a series of new technologies including Vessel detection systems, automatic identification systems, satellite surveillance with Synthetic Aperture Radar (SAR), Cellular phones, etc. have been added to the MCS toolkit

2.6.7 Technologies and tools required for MCS operations

Automatic Identification System (AIS), The International Maritime Organization (IMO) originally required the transmission of AIS messages to prevent collisions. An AIS message, including location, identification, flag, and cargo, is receivable by sensors on land or in the air, and today there is also frequent coverage using space-based AIS. There has been an issue with the veracity of AIS data because of spoofing of AIS signals, which could be accidental due to maintenance issues but could also indicate deceptive operations.

Vessel Detection Systems (VDS) - A Vessel Monitoring System (VMS) is a system in which an on-board transponder relays position, date, speed, and directional information to (shore-based) fishing authorities in real-time, and can be used to assist with area control, border control, and provide accurate locations for patrol vessels to intercept vessels. They can be used to indicate the trans-shipment of fish and the transfer of fuel between vessels. These systems are highly effective for large vessels. However, they only work on

vessels that have been fitted with the VMS equipment. They also produce large quantities of data that must be analyzed and are relatively expensive to install on smaller vessels.

Application to IUU Fishing: While gathering evidence of an IUU fishing offense remains a difficult task, electronic data has in recent times gained greater acceptance as reliable evidence in court proceedings. Satellite imagery provides accurate spatial information on the location of fishing vessels across large areas, and when used in conjunction with VMS data, can assist in the detection of illegal fishing activities. However, it is an expensive technique to use if used frequently, and it is difficult to identify individual vessels from the images.

All European Union vessels above 15 meters in length are fitted with a Vessel Monitoring System (VMS). Similar systems are operational or being brought into operation in other fishing areas and by other fishing nations. The system relies on satellite navigation and communication technologies. A “blue box” installed on board the vessel transmits the GPS-derived vessel position by satellite to the Fisheries Monitoring Centre (FMC) in the flag state which then communicates the information to the state or regional fishery body in whose waters the vessel is fishing. The period between transmissions varies but is normally between one and two hours.

Cellular phones are devices of high interest to people designing low-cost systems and are considered the best field solution for many artisanal fishermen. Advantageous features of smartphones include mobility, durability, wireless capability, and programmatic support for automatic tracking and transmission as well as manual data collection. Disadvantages of smartphones are that power typically lasts a maximum of 24 hours and automatic transmission capability is dependent on cell coverage, although data collected locally can be stored for later transmission. In addition, there is open-source software compatible with smartphones, which includes support for ecological/biological monitoring, as well as operational support and other needs of fishermen.

2.6.8 Conventional MCS Methods

In addition to these modern technologies, the conventional methods or tools of MCS are still in use and they include:

Patrol vessels can be used during fishing to collect legally acceptable evidence of legal and illegal fishing activities. The personnel aboard these types of vessels can verify gear types, catch, logbook entries, discards and dumping. Patrol vessels are considered to be the most important tool in managing offshore and foreign fleets. However, vessels are costly to operate, and can only cover relatively small areas.

Patrol aircraft (planes and helicopters, and unmanned aerial vehicles – UAVs-) can gather accurate vessel location and identification data over large fishing zones, and over short periods of time. This information is useful for the accurate deployment of compliance vessels. They can also gather information on the location of schools of fish and large marine mammals and gather data on reef habitat integrity. However, patrol aircrafts cannot verify gear or catch, and are relatively expensive to deploy.

Beach patrols can be used to monitor fishing activities through the checking of licenses, bag limits, size limits, and gear restrictions. It is also possible to conduct surveys with the fishermen while undertaking patrols which can provide a wealth of information on the near shore and shore artisanal and recreational fisheries and their participants. In some cases, beach patrols may be limited as certain areas cannot be reached by vehicle. Furthermore, their visibility can be a disadvantage as illegal fishermen may see the patrol and take evasive action.

Landing points offer an opportunity for fisheries authorities to ensure that fishermen are complying with the input and output controls that have been put in place for a particular fishery. At the point of landing, fisheries officers can inspect catches, obtain log book information and undertake weighing and measuring of the catch per species. The major limitation with collecting data at landing points is that no data on locations, gear types used, fish trans-shipments, discards, by-catch, or dumping, can be obtained or verified.

Post-landing data sources include data collected from wholesalers, national and export markets, and transport companies. Data from these sources can be used to check that the volume of product is similar to that reported at landing. This also provides market information and price data. The limitation of post-landing data is that it is often difficult to trace from where the fishery products originated.

2.7 *Observer Programs*

Observer Programs is a proven, valuable source of information on the fisheries, unobtainable by any other means. Data acquired by the program are important in identifying the species and size selectivity of several marine fisheries and in reducing the bycatch of protected species. Furthermore, these data improve the biological and economic assessments of the fisheries. In other words, Observer programs provide the regulatory framework for fisheries management as well as ensure compliance with fisheries regulations. Those who collect scientific information are called Observers; those who are concerned with regulations are called Compliance Officers or Inspectors. Fishery observers are generally fishery biologists or college graduates with a concentration in biology. Compliance Officers, also termed Inspectors in some cases have varied backgrounds. Some have extensive practical experience in commercial fishing or other maritime occupations.

2.7.1 *Duties of Observers and Compliance Officers*

Observers and Compliance Officers work both on land and at sea. The information collected by observers provides the best scientific information to manage the fisheries. Compliance officers generally have a legal mandate to enforce the fisheries laws of the country and hence their work deters illegal activities whilst they are on board the fishing vessel. When justified, inspectors may have the power to arrest a vessel at sea and have it return to port. Limitations associated with observer programmes include that the observers require significant training and that this option is only suitable for larger vessels as the observers need to be accommodated on the boat

Land-based observers: Land-based observers are generally stationed or may travel to ports or landing sites where either commercial or artisanal vessels offload their catch. The observer's tasks would include recording the fishing methods used and the catch composition of the landed catch and collecting biological

information for all or some selected species. In some commercial ports the fisheries authorities may establish research laboratories to collect and record more specific scientific data from the catches landed in the port.

Sea-based compliance officers (inspectors): Sea-based compliance officers may be deployed onto vessels for the duration of the trip to monitor fishing activities directly and report on adherence to compliance measures stipulated in license conditions issued by the State. Alternatively, compliance officers may operate independently from a patrol vessel and board and inspect fishing vessels at sea. At-sea inspection can include monitoring gear and catch onboard

Land-based compliance officers (inspectors): Compliance officers are stationed or travel to ports or landing sites where either commercial or artisanal vessels off-load their catch. Their tasks are primarily monitoring whether the gear and landed catches conform to the legislated requirements of the fisheries. Should they find that a vessel or its crew do not conform to any of these requirements they have the authority to prosecute offenders.

2.7.2 Importance of the data collected by Observers

There are three basic functions to effectively prevent fish stocks from becoming overfished: stock assessments to monitor the status of fish populations; knowing the biological limitations of fish populations; and knowing how much is being removed from the sea. The third function is achieved most accurately by onboard monitoring efforts through observer programs. It is truly the only method of accurate multi-species monitoring.

2.7.3 Type of Training Suitable for Observers

Fishery observer training is comprehensive. The duration varies and training courses are given by experts in a variety of fields. Fishery observers are instructed in the identification of fish, mammals, birds, turtles, and invertebrate species, as well as gear identification and measurement, marine safety, and survival skills. The training program also involves aspects of briefing, debriefing, and methods to collect catch data onboard fishing vessels and at onshore processing plants that are used for in-season management and scientific purposes such as stock assessments and ecosystem studies. The goal is to ensure that the data collected by observers are of the highest quality possible by implementing rigorous quality control and quality assurance processes for the data collected by observers. A variety of training Manuals are available in all regions of the Continent and AU -IBAsR has also produced a Training Manual for Observers.

3 INTERNATIONAL LEGAL FRAMEWORKS ON FISHERIES MCS

3.1 *Global Fisheries Instruments with MCS-related Provisions*

The implementation of MCS systems has its legal basis in international instruments such as the LOSC, FAO Code of Conduct for Responsible Fisheries, FAO Compliance Agreement, the UN Fish Stocks Agreement and the FAO Port State Measures Agreement. Similarly, the IPOA-IUU provides the requirement for States to apply specific MCS-related measures from the commencement of the fishing activity to the final destination of caught fish. These measures include vessel registration, issuance of fishing licenses, record of fishing vessels, capacity-building, and implementation of vessel monitoring system, observer programmes, boarding and inspection regimes, and data collection and management. Based on these international instruments, the purpose of MCS systems is to ensure that general fisheries policies and conservation and management measures are implemented fully and expeditiously and to prevent, deter and eliminate IUU fishing.

3.1.1 *United Nations Convention on the Law of the Sea (UNCLOS)*

The United Nations Law of the Sea Convention (LOSC) provides a comprehensive framework for the management of all living marine resources. Most relevant to the promotion of responsible fishing are the regimes established under the LOSC on the exclusive economic zone (EEZ) and the high seas. The regime of the EEZ recognises the sovereign rights of coastal States in conserving and managing living resources in the area, including adopting laws and regulations that apply to foreign fishing vessels conducting fishing activities in the zone. The LOSC also contains provisions on fishing on the high seas, a significant part of which involves the implementation of flag State duties, as well as the duty to cooperate among States.

3.1.2 *FAO Compliance Agreement*

The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO Compliance Agreement) reiterates the provisions of the LOSC with respect to the need for effective control of fishing vessels on the high seas. This agreement applies to all fishing vessels over 24 metres in length and provides measures that flag States are required to implement to ensure the compliance of vessels conducting high-seas fishing with international conservation and management measures. These measures include the issuance of authorizations to fish, maintenance of records of fishing vessels, and cooperation among States for the exchange of information.

3.1.3 *UN Fish Stocks Agreement*

The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) aims to facilitate the implementation of the provisions of the LOSC with regard to the management and conservation of straddling and highly migratory fish stocks. The UN Fish Stocks Agreement generally applies to high seas fisheries, although some of its provisions are also applicable to the EEZ based on the principle of compatibility of conservation and management measures. In addition to the flag State duties stipulated in the FAO Compliance Agreement, the UN Fish Stocks Agreement enumerates other flag State responsibilities such as the implementation of marking of fishing vessels and gear regulations, vessel monitoring systems, observer programs, boarding and inspection, and

port State measures.

3.1.4 FAO Code of Conduct for Responsible Fishing

The FAO Code of Conduct for Responsible Fishing provides principles and standards applicable to the conservation, management and development of all fisheries. It covers capture fisheries, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management. The Code is global in scope and although considered a voluntary instrument, it contains provisions that are reflected in binding instruments such as the LOSC, FAO Compliance Agreement, and the UN Fish Stocks Agreement.

3.1.5 IPOA-IUU

The International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) is the first voluntary international instrument formulated to specifically address IUU fishing. Its objective is “to prevent, deter, and eliminate IUU fishing by providing States with comprehensive, effective, and transparent measures by which to act, including through appropriate regional fisheries management organisations, established in accordance with international law.” The IPOA-IUU is considered a comprehensive “toolbox”, which has a full range of measures that can be used by flag States, port States, coastal States, and “market States” or States which engage in the international trade in fish to deal with various manifestations of IUU fishing within the jurisdiction of States and on the high seas. Measures that cut across the responsibilities of the flag, coastal, port, and market States categorized under “All State Responsibilities” such as the adoption of national plans of action to combat IUU fishing and effective MCS.

3.1.6 IPOA-Capacity

The International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) is a voluntary instrument that applies to all States whose fishers engage in capture fisheries. It contains urgent actions and identifies mechanisms to promote the implementation of the international plan of action. Some of the urgent actions include the assessment and monitoring of fishing capacity and the preparation and implementation of national plans. This report emphasizes the importance of continuous professional development to upscale technical officers in their respective fields and improve their functions.

3.1.7 IPOA-Seabirds

The International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) is a voluntary instrument that sets out activities which implementing States are expected to carry out, including an assessment of whether a problem exists with respect to reducing the incidental catch of seabirds in longline fishery. The IPOA-Seabirds also calls on States to adopt national plans of action addressing the problem as well as procedures for national reviews and reporting requirements. It further provides a summary of appropriate mitigation measures which States may consider in the adoption of the national plans of action.

3.1.8 IPOA-Sharks

The International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) is a voluntary instrument that applies to all States whose fishers engage in shark fisheries. It provides a set

of activities that implementing States are expected to carry out, including an assessment of whether a problem exists with respect to sharks and adoption of national plans of action as well as procedures for national reviews and reporting requirements.

3.1.9 FAO Model Scheme on Port State Measures

A Model Scheme on Port State Measures to Combat IUU Fishing was adopted by the FAO in 2004 which provides guidelines for carrying out inspections of foreign vessels in ports, a list of information that should be provided by vessels in advance to port States, expected results from port inspections, training of port inspectors, and a proposed information system among port States. The Model Scheme conforms to the measures adopted under the IPOA-IUU and all relevant rules of international law and assists States in developing common procedures for inspection and agreed measures against IUU fishing vessels.

3.1.10 FAO Port State Measures Agreement

The Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing was adopted in 2005 and aims to combat IUU fishing through the implementation of effective port State measures, giving emphasis to the role of port States in ensuring the long-term conservation and sustainable use of living marine resources and ecosystems. The agreement applies to foreign vessels seeking entry into a coastal State's ports, except for vessels of a neighbouring State that are engaged in artisanal fishing for subsistence, provided that the port State and the flag State cooperate to ensure that such vessels do not engage in IUU fishing. It also does not apply to container vessels that are not carrying fish, or if carrying fish, only fish that have been previously landed provided that there are no clear grounds for suspecting that such vessels have engaged in fishing activities in support of IUU fishing and/or verified by catch certification system for origin of catch. The port State measures provided in the agreement include designation of ports where foreign vessels can seek entry, advanced notification of entry, port inspection, and port enforcement actions such as the prohibition of landing and transshipment of fish, as well as denial of port entry.

3.1.11 FAO Voluntary Guidelines for Flag State Performance

These Voluntary Guidelines aim to prevent, deter and eliminate IUU fishing or fishing related activities through the effective implementation of flag State responsibilities to ensure the long-term conservation and sustainable use of living marine resources and marine ecosystems. Based on the Guidelines, the flag State should: (a) act in accordance with international law with respect to flag State duties; (b) respect national sovereignty and coastal State rights; (c) prevent, deter and eliminate IUU fishing or fishing related activities in support of such fishing; (d) effectively exercise its jurisdiction and control over vessels flying its flag; (e) take measures to ensure that persons subject to its jurisdiction, including owners and operators of vessels flying its flag, do not support or engage in IUU fishing or fishing related activities in support of such fishing; (f) ensure the conservation and sustainable use of living marine resources; (g) take effective action against non-compliance by vessels flying its flag; (h) discharge its duty to cooperate in accordance with international law; (i) exchange information and coordinate activities among relevant national agencies; (j) exchange information with other States and give mutual legal assistance in investigation and judicial proceedings, as required by their respective international obligations; and (k) recognize the special interests of developing States, in particular the least developed among them and small island developing States, and

to cooperate to enhance their abilities as flag States including through capacity development.

The following table summarizes the ratification and accession of East African States to key international fisheries agreements.

Table 1: Table of Signature, Ratification, and/or Accession of East African States to International Fisheries-Related Agreements

East African State	LOSC (Entered into force on 16 Nov 1994)	UN Fish Stocks Agreement (Entered into force on 11 Dec 2001)	FAO Compliance Agreement (Entered into force on 24 April 2003)	FAO Port State Measures Agreement (adopted August 2009)
Comoros	21 June 1994 (R)	-	-	-
Kenya	02 March 1989 (R)	13 July 2004 (A)	-	19 Nov 2010 (S)
Madagascar	22 August 2001 (R)	-	Ratified	-
Mauritius	04 Nov 1994 (R)	25 March 1997 (A)	Ratified	-
Mozambique	13 March 1997 (R)	10 Dec 2008 (A)	Ratified	19 Aug 2014 (R)
Seychelles	16 Sept 1991 (R)	20 March 1998 (R)	Ratified	19 June 2013 (A)
South Africa	23 Dec 1997 (R)	14 Aug 2003 (A)		-
Tanzania	30 Sept 1985 (R)	-	Ratified	-

(S) Signature (R) Ratification (A) Accession (-) neither signed nor ratified

3.2. A Summary of Legal Requirements

Based on the binding and non-binding international fisheries-related instruments above, the following are the legal requirements for the adoption of MCS tools.

3.2.1 Vessel Registration

The Law of the Sea Convention provides the right of every State to sail ships flying its flag on the high seas (art 90). This right is balanced with the obligation to fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag (art 91). The FAO Code of Conduct provides that a flag State needs to ensure that vessels to which it has allocated its flag carry onboard the original Certificate of Registry or a document that would attest to the nationality of the fishing vessels (art 8.2.2).

The LOSC provides the obligation of a flag State to effectively exercise its jurisdiction and control in administrative, technical, and social matters over ships flying its flag (art 94). Effective control and jurisdiction over fishing vessels are therefore not only limited to the registration of fishing vessels but also to generally accepted international regulations on the construction, equipment, seaworthiness of ships, safety at sea, and labour standards, which are embodied in International Maritime Organization (IMO) and International Labour Organization (ILO) conventions, regulations, and standards. Most of the requirements of IMO conventions however are not fully applicable to fishing vessels because of their unique design and nature of operations.

The uniform standards developed jointly by FAO, ILO, and IMO on the Code of Safety for Fishermen and Fishing Vessels provide some guidelines on promoting the improvement of safety and health on board fishing vessels. The Code provides information on the use of navigational equipment, mechanical equipment, and

safety on deck. It also discusses measures on the safety of fishing operations, particularly trawling, purse seining, Danish seining, longline fishing, tuna pole and line fishing, and fish and ice handling, which are not discussed in any other international guidelines or codes. The FAO, ILO, and IMO have also formulated guidelines on the construction and design of smaller fishing vessels from 12 meters to 24 metres, as well as measures to protect and accommodate crew on these vessels.

Effective jurisdiction and control of States in social matters over ships flying their flags further involves the adherence to maritime labour standards, particularly on the minimum age, medical examination, accommodation, articles of agreement, competency certificates, vocational training, and hours of work, under the comprehensive Maritime Labour Convention of 2006 and the ILO Work in Fishing Convention 2007 (No. 188). These conventions provide the overall responsibility of flag States to ensure the rights of fishers in relation to their service on board fishing vessels, as well as adopt laws and regulations that will ensure fishing vessel owners are responsible for making available to fishers agreements that will address their living and working conditions.

Another flag State duty is to establish requirements for the marking of fishing vessels in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing Vessels. These standard specifications are based on the International Telecommunication Union Radio Call Signs (IRCS) system which is an established international system from which the identity and nationality of vessels can be readily determined. According to the FAO Standard Specification for the Marking and Identification of Fishing Vessels, apart from the name of the vessel or identification mark and the port of registry required by international practice or national legislation, the marking system shall be the only other vessel identification mark consisting of letters and numbers to be painted on the hull or superstructure. Flag States are also required to mark fishing gears in accordance with uniform and internationally recognizable vessel gear marking systems. The FAO has proposed legal and technical measures for the marking of fishing gears. The FAO Technical Guidelines for Responsible Fisheries provide that national legislation should contain a requirement for the marking of fishing gear and fishing implements, including nets, lines, and fish aggregating devices (FADs), in order to identify the owner of the gear.

The IPOA-IUU enumerates other measures that a flag State needs to take into consideration when registering fishing vessels. It emphasises the requirement for the State to ensure that fishing vessels flying its flags, including chartered vessels, do not engage in IUU fishing (paras 34 and 37), avoid flagging vessels with a history of non-compliance (para 36), and deter vessels from reflagging or flag hopping for the purposes of non-compliance with conservation and management measures (para 38). According to the IPOA-IUU, a flag State is required to avoid flagging vessels with a history of noncompliance except for two conditions. One, the ownership of the vessel has subsequently changed and the new owner has provided sufficient evidence demonstrating that the previous owner or operator has no further legal, beneficial or financial interest in, or control of, the vessel. Two, having taken into account all relevant facts, the flag State determines that flagging the vessel would not result in IUU fishing.

3.2.2 Authorization (or Licensing) to Fish

A flag State can exercise effective control over fishing vessels not only through vessel registration but also through the issuance of licenses or authorizations to fish. Paragraph 40 of the IPOA-IUU provides that flag States would need to consider conducting the separate functions of registration and licensing of fishing vessels in a manner that ensures each gives appropriate consideration to the other. For example, a flag State should consider making its decision to register a fishing vessel conditional upon it being prepared to provide an authorization to fish to that vessel. Furthermore, according to the FAO Compliance Agreement, if a fishing vessel that has been authorised to be used for fishing on the high seas by a Party to the Agreement ceases to be entitled to fly the flag of that Party, the authorisation to fish on the high seas shall be deemed to have been cancelled (art III). Since the functions of fishing vessel registration and licensing often fall under the jurisdiction of different authorities, cooperation and information sharing between responsible agencies are required. The need to coordinate vessel registration and licensing functions responds to the poor communication between relevant agencies common in many countries. Such problem is exacerbated by outsourcing vessel registration especially for high seas vessels, without taking into account the need for effective flag State responsibility. The FAO Voluntary Guidelines for Flag State Performance provides the minimum requirements for the registration and licensing of fishing vessels and also calls for the exchange of information and coordination of activities among relevant national agencies.

A flag State has the duty to issue licences to fishing vessels conducting operations on the high seas, including areas managed by regional fisheries management organisations (RFMOs) to which the flag State is a member, and areas under the jurisdiction of a coastal State to the fishing vessels of a flag State are allowed to fish under an agreement or arrangement. Article III(5)(a) of the FAO Compliance Agreement specifically provides that no Party shall authorize any fishing vessel previously registered in the territory of another Party that has undermined the effectiveness of international conservation and management measures to be used for fishing on the high seas, unless it is satisfied that two conditions have been met. One, any period of suspension by another Party of an authorization to fish on the high seas has expired and two, no authorization to fish on the high seas for such fishing vessel has been withdrawn by another Party within the last three years.

The effectiveness of a fishing vessel licensing system to combat IUU fishing does not solely depend on the issuance of a valid authorization to fish, but more specifically on the enforcement of the terms and conditions of a fishing license. The UN Fish Stocks Agreement provides that one of the duties of a flag State is to establish regulations for the application of certain terms and conditions on a fishing license (art 18). The IPOA-IUU provides some of the conditions under which a fishing license may be issued. A fishing license contains basic information such as the name of the vessel, and where appropriate, the natural or legal person authorized to fish, as well as the areas, scope and duration of the authorization, and authorized species and fishing gear and other applicable management measures (para 46). Other requirements may also be imposed on a fishing license, such as:

- vessel monitoring systems;
- catch reporting conditions;
- conditions related to transshipment, if permitted;
- observer coverage;

- maintenance of fishing and related logbooks;
- navigational equipment;
- marking of fishing vessels and gears according to international standards;
- use of internationally recognised fishing vessel identification number; and
- compliance with measures related to maritime safety, protection of the marine environment, and other conservation and management measures (para 47).

3.2.3 Vessel Monitoring System

The IPOA-IUU encourages States to implement vessel monitoring systems which includes requiring their vessels to carry VMS equipment on board (para 24). The LOSC provides the right of a coastal State to require vessels of other States that fish in its EEZ to submit certain information, such as vessel position reports (art 62). Similarly, the UN Fish Stocks Agreement provides that one of the duties of flag States with respect to MCS is the development and implementation of VMS in accordance with regional, sub-regional or global programmes (art 18). While the LOSC largely regulates foreign vessels conducting fishing operation in the EEZs of coastal States, the IPOA-IUU and the UN Fish Stocks Agreement are also applied to national vessels; thus, having a wider application.

VMS responds to the international requirement of collecting and verifying fish catch and effort, and other fishing activities for more effective fisheries management. There are different types of VMSs. The more conventional type of VMSs relies on vessel movement report through radio, aerial or surface surveillance, land-based radar, sea-based sonar, observer programs or incidental reports by other fishing vessels or airplanes. This type of VMS is used to monitor areas in the immediate vicinity and is therefore more local in coverage. The other type of VMS is satellite-based. In general, VMS provides monitoring agencies with accurate locations, at periodic time intervals, of fishing vessels participating in the VMS. Newer technologies such as satellite-based VMS which provides real time information from fishing vessels supplement observer reporting on fishing activities of vessel and assist towards integrated fisheries monitoring (IFM). The integration of VMS in fisheries regulations highlights its importance as a management tool and assists in ensuring compliance of fishing vessels with national laws and regulations.

3.2.4 Observer Program

In order to ensure that fishing operations are documented and that fishing vessels comply with conservation and management measures, States are encouraged to establish observer programs. Under the LOSC, States have the right to place observers on board vessels in exercising their sovereign right over marine resources in their EEZs (art 62). This provision applies to foreign vessels fishing in the EEZs of coastal States. There is also a duty under the UN Fish Stocks Agreement to implement national observer programmes, participate in sub-regional or regional observer programs, and permit observers of other States to carry out functions agreed under such programs (art 18). These international instruments, however, do not provide the specific functions of and the process involved in conducting observer programs.

The primary advantage of implementing an observer program is that it collects data required for determining the status of living marine resources and the consequences of commercial fishing operations. Observer programs are usually implemented in order to generate data for fishery science, management

and compliance purposes. Implementation of an observer programme for fishery science involves the estimation of total catch and effort, including by-catch and discards, and biological sampling of catches. To ensure compliance with fisheries laws and regulations, observers may be given the right to validate logbooks and inspect documents, visit fishing vessels, and collect catch data. The information obtained from both types of observer programmes is necessary for effective fisheries management.

As a component of MCS, an observer program allows for the verification of reported fisheries data, such as information recorded by fishing vessels in their logbooks, which is an effective means to detect unreported fishing. Observer records and information may also be required as evidence in the prosecution of a violation by a vessel, owner or company. Such evidence will be more admissible if the observer program has developed standardized formats, methods and protocols for recording and handling compliance-related issues. For the purpose of using observer reports in establishing a fisheries violation, there is a need for the competence of observers to be established, particularly in the event of litigation, by means of standard training. Aside from the proper execution of his or her rights and responsibilities, there is also a need for an observer to have a common understanding of the interpretation of the provisions of relevant legal instruments or agreements.

3.2.5 Boarding and Inspection

The IPOA-IUU encourages States to implement national and internationally-agreed boarding and inspection regimes consistent with international law (paras 24.10 and 80.8). Article 73(1) of the LOSC provides that a coastal State may undertake measures such as boarding and inspection in exercising its rights to conserve and manage living resources in the EEZ. The LOSC does not provide specific measures as to how a coastal State may implement its boarding and inspection scheme. In general, however, a boarding and inspection scheme involves five key steps: detection, approach, boarding, inspection, and disembarkation. It may involve a routine boarding and inspection or boarding with the suspected violation.

Another aspect of a boarding and inspection scheme is the use of force. Under the LOSC, States are required to fulfil their obligations under the Convention in good faith and exercise their rights, jurisdiction and freedoms in a manner that would not constitute an abuse of right (art 300). Furthermore, States are required to refrain from any threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the principles of international law embodied in the Charter of the United Nations (art 301). These provisions must be considered by a coastal State in using force with respect to exercising its right to board and inspect foreign fishing vessels.

While observer programs are most effective in detecting unreported fishing, boarding and inspection regimes are more crucial in determining if an illegal or unregulated fishing activity has occurred. However, as can be gleaned from State practice, an effective legal regime for boarding and inspection in the EEZ does not stop with the acts of boarding and inspection. It also involves seizure of vessels, fishing gears and other fishing implements, and documents and other records, as well as the prosecution of fisheries offenders and application of sanctions and penalties.

A coastal State is also given the right to conduct boarding and inspection on the high seas subject to certain conditions. The UN Fish Stocks Agreement contains elaborate provisions on boarding and inspection on the high seas to ensure the conservation and proper management of straddling and highly migratory fish stocks, some of the provisions of which are applicable with respect to coastal State jurisdiction. The UN Fish Stocks Agreement provides the duties and responsibilities of the inspecting State (and inspectors) and flag States (and vessel masters) in the course of boarding and inspection. Members of RFMOs are given the right to board and inspect fishing vessels flying the flag of another State Party to a regional fisheries agreement subject to agreed boarding and inspection provisions of the RFMO, or the basic procedures for boarding and inspection set out in Articles 21 and 22 of the UN Fish Stocks Agreement. These rights are limited to the inspection of the vessel, its license, gear, equipment, records, facilities, fish and fish products, and any documents necessary to verify compliance with relevant conservation and management measures. An inspecting State may also investigate if there is a possible violation conducted by the vessel. If there are clear grounds for believing that a vessel has engaged in any activity contrary to the regulations of an RFMO, the inspecting State is required to notify the flag State to enable the latter to investigate and take action, if evidence warrants, against the vessel. The inspecting State may only take enforcement action against the vessel only after the flag State fails to act on the alleged violation, such as bringing the vessel to the nearest port. A flag State has the obligation to ensure that vessel masters cooperate with and assist in the inspection of the vessel.

3.2.6 Port State Measures

International law recognizes the sovereignty of States over their territories and nationals. Once a vessel has voluntarily entered a port, it becomes subject to the laws, regulations, and enforcement powers applicable in the internal waters of a port State. Under the LOSC, a port State has the right to take necessary steps to prevent any breach of the conditions associated with a port call (art 25). It may also undertake investigations or institute proceedings with respect to any vessel discharge in violation of applicable rules of international law when a vessel is voluntarily in its port or offshore terminal.

The UN Fish Stocks Agreement establishes the role of port States in fisheries. Article 23(1) of the UN Fish Stocks Agreement provides for the right and duty of a port State to take measures to promote the effectiveness of sub-regional, regional, and global conservation and management measures. A port State is given the right to inspect documents, fishing gear and catch on board fishing vessels when a fishing vessel is in its ports or offshore terminals. The UN Fish Stocks Agreement also allows a port State to undertake enforcement actions such as the prohibition of landings and transshipments if it has been established that the catch has been taken in a manner which undermines the effectiveness of a conservation and management measure on the high seas. Such measures need to be applied in a fair, transparent, and non-discriminatory manner.

Examples of measures and enforcement actions that may be applied by port States include advanced notice of port entry, designation of ports, inspection of fishing vessels, prohibition of fish landing and transshipment, and denial of port entry.

3.2.7 Advanced notice of entry

The IPOA-IUU provides the requirement for fishing vessels and vessels involved in fishing-related activities to provide a reasonable advance notice of their entry into port, a copy of their authorization to fish, details of their fishing trip, and quantities of fish on board (para 55). The FAO Model Scheme provides a list of specific information which States may require from foreign fishing vessels prior to their entry into ports, which includes details related to the identity of the vessel, the purpose of port access, details on fishing authorization, information about the trip, and information on species caught.

3.2.8 Designation of Ports

Foreign fishing vessels generally call into ports where services are available for their landing and transshipment needs. It is therefore necessary for States to designate ports where such foreign fishing vessels may be admitted. Based on the IPOA-IUU, part of the responsibility to designate ports where foreign fishing vessels may be permitted admission is the need to publicize such ports, and more importantly, ensure that such ports have the capacity to conduct inspections (para 57).

3.2.9 Inspection of Fishing Vessels

Under the IPOA-IUU and FAO Model Scheme, a port State is required to carry out inspections of foreign fishing vessels for the purpose of monitoring compliance with relevant conservation and management measures. There are different elements comprising the inspection of foreign fishing vessels. These elements include the procedure for inspection, what to inspect, the precautions that need to be taken when inspecting vessels, information that needs to be collected, reporting information to relevant authorities, and safeguarding and confidentiality of information. The procedure starts with vessel identification, inspection of authorization to fish and other documentation, and examination of fishing gear and fish and fishery products. Vessel identification involves the verification of the validity of the identity documents and confirmation of information through appropriate contacts with flag States and RFMOs. It also includes an examination of whether the vessel has changed flag and its port of registration and ownership. The FAO Model Scheme provides for the rights of the master of the vessel during the inspection, as well as his or her obligation in providing all the necessary assistance and information to the inspector.

After port inspection of a foreign fishing vessel, its documents, fishing gears and other equipment, and fish and fish products onboard the vessel, it is necessary to report the results of the inspection. A port State needs to ensure that the results of the inspection are presented to the master of the vessel and signed by both the inspector and the master. The master would also need to be provided the opportunity to add any comment to the report and contact the relevant authorities of the flag State if he or she is encountering serious difficulties in understanding the report. The FAO Model Scheme also provides that the port State should report on the results of its inspections to the flag State of the inspected vessel, other relevant States, and to relevant RFMOs.

3.2.9 Enforcement Actions

Following an inspection, if there are clear grounds that a foreign vessel in port has engaged in or supported IUU fishing, there are two examples of port enforcement actions that may be undertaken. One of the enforcement actions that may be taken based on the IPOA-IUU (para 56) and UN Fish Stocks Agreement

(art 23) is the prohibition of landing and transshipment of fish. This is the most common enforcement action applied by port States. The other action, based on the FAO Port State Measures Agreement is the denial of port access (art 11). Denial of port entry follows the principle that the port State exercises full sovereignty in its ports. In case of force majeure, a port State has the obligation to give port access to fishing vessels. These measures are accompanied by the obligation to report the matter to the flag State of the vessel.

3.2.10 Catch Certification

Based on the IPOA-IUU, trade-related measures to reduce or eliminate trade in fish and fish products derived from IUU fishing could include multilateral catch documentation and certification requirements, as well as other appropriate multilaterally-agreed measures such as import and export controls or prohibitions (para 69). Catch certification is one of the schemes used by RFMOs that require documentation to accompany particular fish and fish products bound for international trade. In RFMO practice, trade documents accompany fish and fish products that enter through international trade by identifying the origin of fish for the purpose of ascertaining levels of unreported fishing. Catch certification is issued by relevant national authorities at the point of harvesting and covers all fish to be landed or transhipped.

The European Union, one of the major fish importers, has adopted an IUU fishing regulation (EC 1005/2008) that prohibits the importation of fishery products obtained from IUU fishing. This objective is implemented through a catch certification scheme. In general, the importation of fishery products into the EU is only allowed when accompanied by a catch certificate, completed by the master of the fishing vessel, and validated by the flag State of the vessel. To be valid, the catch certificate must contain all information specified in the template documents shown in Annex II of the EU IUU Regulation, including:

- basic information such as the name of the fishing vessel, home port and registration number, call sign, license number, Inmarsat number, and IMO number (if issued);
- information on the product (the type of species, catch areas and dates, estimated live weight and verified weight landed, as well as the applicable conservation and management measures and any transshipment at sea is also required); and
- information and declaration on export and import of the fishery product (including the vessel name and flag, flight number airway bill number, truck nationality and registration number, other transport documents, and container number).

The indirect importation and exportation of fishery products are subject to the validation of a catch certificate by the competent authorities of the flag State of the vessel.

3.2.11 Other Measures

There are also other MCS measures provided in international fisheries-related instruments that can be used to prevent, deter and eliminate IUU fishing. These measures include the development of national plans of action, effective data collection system, application of sanctions of sufficient severity, the exercise of the right of hot pursuit, use of evidentiary standards and admissibility of electronic evidence and new technologies in court, and market-related measures.

3.3 Global Cooperation on MCS to Combat IUU Fishing

3.3.1 International MCS Network

The International Monitoring, Control, and Surveillance (IMCS) Network was established as a voluntary organization in 2001 to provide a mechanism for fisheries law enforcement professionals to share information and experiences to improve the effectiveness of fisheries-related MCS activities through enhanced cooperation, coordination, information collection and exchange among national organizations and institutions responsible for MCS. The IMCS Network operates informally and encourages participation from fisheries managers, investigators, lawyers, foreign service officers, and forensics specialists. In order to enhance cooperation, the IMCS Network focuses on the following activities:

- Collection and hosting of relevant documents, reports, and laws on the Network website;
- Production and dissemination of a Network Newsletter, containing both news articles and original pieces;
- Production and implementation of a country MCS Needs Assessment;
- Organization of a biennial Global Fisheries Enforcement Training Workshop for MCS practitioners to network and exchange information, experiences, and lessons learned;
- Organization and implementation of MCS pieces of training on capacity-building efforts to improve the MCS abilities of member governments;
- Production of analytical responses to “Requests for Information” received from member governments and relevant stakeholders;
- Production of original analytical pieces on IUU trends, new MCS technologies, and additional topics of interest; and
- Development of relationships, cooperation, and information sharing capabilities among members and additional MCS practitioners.

A number of relevant studies, documents, and links on IUU fishing and MCS are available at the IMCS website (www.imcsnet.org).

Except for Comoros and Madagascar, East African States are part of the IMCS network.

3.3.2 INTERPOL Fisheries Crime Working Group

There is also increasing recognition that illegal fishing has escalated to involve transnational criminal groups. Hence in 2013, INTERPOL launched Project Scale to detect, suppress, and combat fisheries crime. The Project’s objectives include:

- generating awareness regarding fisheries crime and its consequences;
- establishing National Environment Security Task Forces to ensure cooperation between national and international agencies;
- assessing the needs of vulnerable member countries to effectively combat fisheries crimes; and
- conducting operations to suppress crime, disrupt trafficking routes, and ensure the enforcement of national legislation.

INTERPOL established a Fisheries Crime Working Group under this initiative to develop the capacity, capability, and cooperation of member countries to effectively address fisheries crimes. The Fisheries Crime Working Group aims to facilitate the exchange of information, intelligence, and technical expertise between countries for purposes of fisheries law enforcement. Several countries have cooperated within the INTERPOL network and have called upon the international organization to issue 'Purple Notices' to illegal fishing vessels. INTERPOL's Purple Notices are used to seek or provide information on the modus operandi, objects, devices, and methods used by criminals

Ongoing Transboundary regional MCS Initiatives in shared aquatic ecosystems, existing protocols and sources of funding

4 REGIONAL COOPERATION AND FRAMEWORKS ON FISHERIES MCS

The development of MCS tools, as well as cooperation among nations has been emphasized strongly in international instruments discussed in Part 2. As the Eastern African – Indian Ocean marine fisheries are part of a larger marine ecosystem shared by all countries of the East African region, the effective conservation and management of shared international fisheries resources call for actions to be undertaken at the regional and sub-regional levels. A number of regional organizations and institutions provide the context and basis for the development and implementation of coordinated MCS measures among the East African coastal States including the existing Regional Economic Communities (RECs) and Regional Fisheries Bodies (RFBs). RFBs play a primary role in the sustainable management and utilization of fisheries resources by means of facilitating regional cooperation. The role of these organizations and institutions in MCS implementation is discussed below.

The African Union has also developed a Policy Framework and Strategy for Reform of Fisheries and Aquaculture, which was adopted by the 23rd Summit of African Heads of States and Governments in Malabo, Equatorial Guinea, in June 2014. This framework aims to effectively reverse the current trend of loss in order to derive benefits from fisheries resources in the African States. To contribute to the implementation of this Policy Framework and Strategy of Reform, the African Union has received support from the European Union to implement a project on "Strengthening institutional capacity to improve the governance of the fisheries and aquaculture sector in Africa". A key component of improving governance in fisheries is the adoption of an effective MCS system at both the national and regional levels.

4.1 Regional Requirements on MCS

Regional cooperation in MCS is crucial if effective fisheries management, particularly of shared stocks is to be achieved. Bilateral, sub-regional, and regional cooperation on MCS can include the exchange of fisheries data, harmonized legislation, implementation of flag and port State control agreements, and combined measures to address IUU fishing. However, regional or sub-regional cooperation entails a number of additional responsibilities for States. These responsibilities include the security of sensitive data, how differences between participating States will be resolved in order to present a unified regional position, and how to take into account differences in economic situations of member States when devising cost-

sharing arrangements to support the implementation of regional MCS system. Despite challenges, there are examples of regional organizations which have successfully dealt with issues related to the implementation of MCS measures, such as the South Pacific Forum Fisheries Agency (FFA), the Organisation of Eastern Caribbean States (OECS) Fisheries Unit, the Caribbean International Community (CARICOM) Fisheries Resource Assessment and Management Programme (CFRAMP), the Northwest Africa Subregional Fisheries Commission (SRFC), and the Indian Ocean Tuna Commission (IOTC).

4.2 Combating IUU acting through Relevant RFMOs

Based on the IPOA-IUU, in order to successfully combat IUU fishing, States, acting through relevant RFMOs may adopt a number of measures:

1. strengthen institutional framework with a view to enhancing their capacity to address IUU fishing;
2. develop compliance measures in conformity with international law;
3. develop and implement comprehensive arrangements for mandatory reporting;
4. cooperate in exchanging information on vessels engaged in or supporting IUU fishing;
5. maintain records of vessels fishing in the area of competence of a relevant regional fisheries management organization, including both those authorized to fish and those engaged in or supporting IUU fishing;
6. develop methods of compiling and using trade information to monitor IUU fishing;
7. develop MCS, including real time catch and vessel monitoring systems, other new technologies, monitoring of landings, port control, and inspections and regulation of transshipment, as appropriate;
8. develop within a RFMO, where appropriate, boarding and inspection regimes consistent with international law, recognizing the rights and obligations of masters and inspection officers;
9. develop observer programs;
10. where appropriate, market-related measures in accordance with the IPOA;
11. define circumstances in which vessels will be presumed to have engaged in or to have supported IUU fishing;
12. develop education and public awareness programmes;
13. develop action plans; and
14. where agreed by their members, examine chartering arrangements, if there is concern that these may result in IUU fishing (para 80).

It should be noted though that these measures are generally adopted by RFBs with management functions. However, these measures may also be adopted as a matter of policy in other regional organizations to facilitate cooperation amongst States on MCS.

In Table 3 of this Technical Report, it can be observed that the MCS measures that States, acting collectively within relevant RFMOs, may be able to adapt to address IUU fishing are very similar to those discussed in Part 2 of this Report. An exception would be the development of the IUU vessel listing. The IPOA-IUU clearly supports the listing of IUU vessels in RFMOs which were developed by States in a collective and fair and transparent manner. The IPOA-IUU does not provide for the listing of IUU vessels by individual countries.

4.3 Fisheries Framework for the African Region

The framework for the conservation and management of marine capture fisheries in Africa forms part of the bigger mission to end hunger and poverty in the continent through the sustainable use of animal resources. The African Union-InterAfrican Bureau of Animal Resources (AU-IBAR) provides leadership in achieving this objective by empowering the AU Member States and RECs through the promotion of a common position for the region and harmonization of policies and regulations.

Although there has been some recognition of the role of fisheries in sustainable development, policymakers have placed little emphasis on their contribution to national development, food security, and the need to optimize the benefits of these resources to the centre of national development planning. Hence, the African Union has taken significant steps to improve the performance of the fisheries sector. In 2003, the New Partnership for Africa's Development developed the Comprehensive Africa Agriculture Development Programme (CAADP) which was endorsed by Member States. The Sirte Declaration in 2004 encouraged the development of African fisheries resources as well as urged regional cooperation in fisheries management. The Declaration adopted at the NEPAD Fish for All Summit in Abuja, Nigeria in 2005 emphasized commitments to the Strategic Partnership for African Fisheries. Consequently, African countries began the dialogue to strengthen the African Voice in international policy and negotiating platforms. The Conference of African Ministers of Fisheries and Aquaculture (CAMFA I) was convened in 2010 and the Joint Ministerial Conference of Agriculture, Rural Development, Fisheries, and Aquaculture in 2014 to respond to the challenges and opportunities in the fisheries and aquaculture sector.

4.3.1 First Conference of African Ministers of Fisheries and Aquaculture (CAMFA I)

During the meeting of the African Ministers of Fisheries and Aquaculture at the CAMFA I held in Banjul, The Gambia on the 23rd of September 2010, the African Ministers expressed concern about the magnitude of IUU fishing as one of the threats facing the fisheries sector. The Ministers agreed on the need for urgent actions at national and regional levels to deter and eradicate IUU fishing. Member States, RECs, and RFBs were urged to adopt and implement the IPOA-IUU and port state control measures. In order to curb IUU fishing across the African continent the meeting requested that flag State responsibility be fully implemented by all vessels flying flags of African States. It was recommended that Member States, RECs, and RFBs strengthen MCS and foster regional cooperation to curb IUU fishing.

4.3.2 Joint Ministerial Conference of Agriculture, Rural Development, Fisheries, and Aquaculture

The Joint Ministerial Conference was held in Addis Ababa, Ethiopia, from 28th April to 1st May 2014 with a theme "Transforming Africa's Fisheries and Aquaculture for Food and Nutritional Security, Improved Livelihoods and Wealth". The key resolutions made by the joint conference and which are relevant to this report were to (1) endorse the Policy Framework and Reform Strategy; (2) undertake fisheries and aquaculture reforms; (3) develop fisheries and aquaculture as an integral part of the CAADP; and (4) enhance fish trade. The Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa was approved for development. The meeting reaffirmed commitments by Member States to strengthen the MCS capacity including implementation of port states measures, flag State measures, and related instruments in order to combat IUU fishing. Member States were urged to implement measures to combat IUU fishing by implementing an appropriate plan of action and measures including port State measures.²⁸

4.2.3 Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa

This Pan-African document was endorsed by the summit of African Heads of State and Governments in June 2014, in Malabo, Equatorial Guinea as a blueprint for African fisheries and aquaculture development. One of the key priority policy arenas in this document is the sustainable use and conservation of fisheries resources. It is recognized that inadequate cooperation and collaboration among African States contribute to the high incidence of IUU fishing in the continent, representing over UUSD 1.5 billion of lost resource rents in 2011 for African countries. Developing and strengthening the institutional framework for MCS for both marine and inland fisheries is seen as means towards combating IUU fishing.

In particular, the priority policy arenas identified in the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa as needing reforms are: 1) conservation and sustainable resource use; 2) small scale fisheries development; 3) sustainable aquaculture development; 4) responsible and equitable fish trade and marketing; 5) strengthened regional and sub-regional cooperation; 6) awareness enhancing and human capacity development; and 7) high seas fisheries. The cross-cutting issues in the African fisheries and aquaculture sector were identified in this policy document as climate change adaptation and disaster risk management, gender and youth development, finance and investment. Key objectives and summary of strategic actions highlighted for each policy arena.

4.3.4 Various African Union Activities on Fisheries

To demonstrate its commitment to improving the fisheries sector and promoting harmonized policies consistent with the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa, the African Union has conducted a number of activities, including the Establishment of an African Platform for Regional Institutions in Fisheries, Aquaculture and Aquatic Systems (APRIFAAS), the formulation of criteria and indicators and criteria for alignment of national and regional fisheries and aquaculture policies to provisions of the pan African policy document. The AU-IBAR has also conducted a scoping mission on MCS in the IOC region, West, Central, and SADC Secretariat, and established baseline information on strengthening and/or establishing regional MCS centers.

4.4 MCS Capability and Relevance to Regional Organizations and Arrangements

MCS are key factors to compliance with internationally or regionally agreed frameworks, policies, plans or strategies for the management and conservation of fisheries resources. Its absence or ineffectiveness is a major result of a poor or insufficient fisheries management. Improved interstate, State, and regional coordination and information exchange, and support of resource users are known to be foremost factors to success in addition to effective implementation of MCS systems.

In response to the global request for international cooperation against IUU fishing, many States have enforced (following considerable legislative, regulatory, policy and enforcement adjustments) different types of regulatory measures in order to prevent, deter, and eliminate IUU fishing. At the regional level, efforts have also been intensified over the last decades against IUU fishing, particularly through the RFBs by establishing MCS frameworks.

4.4.1 Southwest Indian Ocean Fisheries Commission (SWIOFC)

The SWIOFC is a regional fisheries body established under Article VI of the FAO Constitution. With its Secretariat based in Mozambique, it promotes the application of the provisions of the FAO Code of Conduct on Responsible Fisheries, including the precautionary approach and the ecosystem approach to fisheries management.

Among the functions and responsibilities of the Commission relevant to MCS are:

- to contribute to improved governance through institutional arrangements that encourage cooperation amongst members;
- to keep under review the state of the fishery resources in the area and the industries based on them;
- to promote the collection, exchange, dissemination and analysis or study of statistical, biological, environmental and socio-economic data and other marine fishery information;
- to provide advice and promote co-operation on monitoring, control and surveillance, including joint activities, especially as regards issues of a regional or sub-regional nature.

Member States include Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and Tanzania.

SWIOFC has played a crucial role in promoting and facilitating collaboration and cooperation in the region with regard to fisheries issues, serving as a platform for the development of several regional projects. Hence, SWIOFC has provided an important forum for sharing information on MCS and has thus helped promote a better regional coordination of MCS activities that are being done by organizations such as the Indian Ocean Commission (IOC) and the South African Development Community (SADC), as well as by SWIOFC Member States. Coordination on MCS is however challenged by the different MCS capabilities of Member States.

Through funding by the World Bank Group including a total of US\$75.5 million the SWIOFC will contribute towards improvement of fishing-related activities for families living in the coastal communities of the South West Indian Ocean region.

4.4.2 The Indian Ocean Tuna Commission (IOTC)

The IOTC in Eastern Africa provides the mechanism for achieving cooperation between and among States participating in tuna fisheries. The IOTC has a responsibility for conserving and managing the tuna stocks in its area of competence. The adoption of conservation and management measures is central to the work of the IOTC, which Member States are required to implement. The adoption of such measures is facilitated through the decision-making procedures of the IOTC. The effectiveness of these measures is reliant upon the commitment of Member States to address issues that are critical to the sustainability of tuna resources under the management mandate of the IOTC. Fundamental to the enforcement of RFMO conservation measures are effective MCS.

The IOTC has adopted a number of MCS-related measures including; landing of catch, port inspection and transshipments, vessel registers and information relating to IUU fishing, inspection and enforcement, VMS, and cooperation with non-members thus:

- i. Record of authorized vessels (IOTC Resolution 14/04) – The IOTC requires the establishment and maintenance of a record of vessels that are authorized to fish for tuna and tuna-like species in the IOTC Area. Vessel records are essential for the Commission to establish its fishing capacity goals. A record of active vessels and list of IUU vessels are also maintained.
- ii. Port State Measures (IOTC Resolution 10/11) – This measure was developed consistent with the FAO Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing;
- iii. Vessel registration (IOTC Resolution 13/02) - Regarding vessels registration, the IOTC requires fishing vessels to carry on board documents issued and certified by the competent authority in respect of authorization to fish, vessel name, port in which registered and number of registrations, international call sign, names and addresses of owner, length and engine power of vessel. Fishing vessels should also be appropriately marked in conformity with international standards such as the FAO Standard Specification for the Marking and Identification of Fishing Vessels and Gears. Fishing vessels are also required to keep a bound fishing logbook. At the 18th session Members proposed the need to address the challenge of IUU fishing by streamlining the application of the IMO numbers to all vessels greater than 100GT across all RFMOs and making unique vessel identifiers mandatory by 2016.
- iv. Vessel monitoring system (IOTC Resolution 06/03) - The IOTC requires Members to adopt a satellite-based VMS for vessels greater than 15 metres in length overall, registered on the IOTC Record of Vessels which operate in the IOTC Area and which fish on the high seas. At the 18th Session which took place from 1-5 June 2014 in Colombo, Sri Lanka one of the proposals from the CPCs was to improve VMS and observer coverage in order to strengthen MCS in the IOTC.
- v. Regional observer program (IOTC Resolution 10/04) – The regional observer program includes the verification of documents on board fishing vessels (authorization to fish and fishing logbook), marking of vessels (consistent with information in the IOTC Record of Authorised Vessels) as well as their VMS. Resolution 14/06 provides for an observer programme to monitor at-sea transshipments, by placing observers on carrier vessels. Resolution 11/04 establishes a Regional Observer Scheme that includes observers on board fishing vessels and port sampling for artisanal fisheries. The observer scheme has the dual role of collecting data and monitoring compliance with IOTC conservation and management measures. Thus, the observer is required, inter alia, to observe and estimate catches in order to identify catch composition and monitor discards and by-catches, as well as record the gear types, mesh size, and attachments employed by the master.

As worthy as these measures and proposals are, any conservation and management measures adopted by the IOTC are only effective if member States and cooperating non-members comply with the requirements. Compliance with Resolutions, particularly by industrial and semi-industrial fleets using purse seine, longline and gillnets, is fundamental to the development of rigorous conservation and management strategies in the IOTC.

Organizations such as International Seafood Sustainability Foundation (ISSF) and World Wide Fund for Nature (WWF) have concerns at the level of non-compliance with IOTC Resolution 14/06 on transshipment

by large-scale tuna vessels because strengthening compliance with transshipment is critical to the successful elimination of IUU fishing activities. These organisations still call for increasing observer coverage on purse seiners to 100 per cent and increasing the coverage on longline vessels via human or electronic means.

4.4.3 South Indian Ocean Fisheries Agreement (SIOFA)

SIOFA is a regional fisheries arrangement (as opposed to a body) which entered into force on 21 June 2012 as a legally-binding treaty with the objective of ensuring the long-term conservation and sustainable use of non-highly migratory fish stocks in the high seas of the southern Indian Ocean. The Agreement promotes the long-term conservation and sustainable use of fisheries resources in this area by applying principles such as the precautionary approach, ecosystem-based approaches to fisheries management and encouraging the development of effective monitoring, control and surveillance measures to ensure compliance. The SIOFA Area of Competence covers the high seas between eastern Africa and Western Australia. East African Member States of this organization are Mauritius and Seychelles.

Meetings are conducted through a Meeting of the Parties. These meetings review the state of fishery resources, promoting research and cooperation, adopting generally recommended international minimum standards for fishing, developing rules and procedures for monitoring of compliance by vessels and developing measures to prevent, deter and eliminate IUU fishing.

4.5 Other Regional MCS Initiatives

Other regional initiatives should be noted, such as the Stop Illegal Fishing FISH-i Africa and the SmartFish Programme of the Indian Ocean Commission. Other organizations, particularly RECs are also important institutions such as SADC and East African Community.

4.5.1 FISH-i Africa

FISH-i Africa is a task force uniting seven Southeast African coastal States along the Western Indian Ocean that enables authorities to identify and act against large-scale IUU fishing. These are Comoros, Kenya, Mozambique, Seychelles, Tanzania, and Madagascar and Mauritius. This initiative has shown that regional cooperation, coupled with dedicated data analysis and technical expertise can stop illegal fish catch getting into the market, and prevent criminal fishers pursuing their business unhindered.

Under this initiative, Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles and Tanzania share vessel data real-time and access satellite tracking expertise. FISH-i Africa partners with various agencies to deliver its mandate. The Stop Illegal Fishing (SIF) working group of the New Partnership for Africa's Development (NEPAD) Planning and Coordination Agency coordinates FISH-i Africa. Hence, NEPAD provides FISH-i Africa with both legitimacy and a role within the wider policy and strategic framework of African fisheries. The FISH-i Africa model has potential and could be replicated in other African regions.

SIF plays a central role in strengthening cooperation and coordination between governments and partners in order to support the African Union's and NEPAD's agendas and other pan-African and international processes to stop illegal fishing in African waters. PEW Charitable Trusts is also a partner under its wider Ending Illegal Fishing Project. The Norway-based Fisheries Analytical Capacity Tank (FACT) helps to identify

and track fishing vessels and analyze fishing fleets, ownership structures, and crimes associated with illegal fishing. Thus, FISH-i Africa has carried out investigations of cases involving individuals from Asia to Africa to the Middle East in regard to port measures, document checks, de-registering fishing vessels, vessel identification checks, and vessel tracking and location.

4.5.2 Indian Ocean Commission (IOC)

The IOC comprises Comoros, France/Reunion Island (not part of this report), Madagascar, Mauritius and Seychelles. The IOC's principal mission is to strengthen the ties of friendship between these countries and be a platform of solidarity for the entire population of the Indian Oceanic region. Hence, the IOC has championed the cause of small island States in regional and international fora. The Secretariat of the Commission is located in Mauritius. The organisation has a system of rotating presidency of each Member State and the Presidency is currently held by Comoros. The EU is the main development partner of the IOC and accounts for more than 80 percent of total financial support to IOC.

Although these Island States have different characteristics (Reunion is a French department; Mauritius and Seychelles are Middle-Income Countries whereas Comoros and Madagascar are amongst the Least Developed Countries), these islands share geographic proximity, natural resources, and common development issues.

Under the SmartFish Programme, the IOC Member States have been provided with support in addressing issues associated with IUU fishing through regional MCS cooperation. The Member

States are therefore able to achieve the following:

- Exchanging VMS and satellite positioning data;
- Collection of data by IOC;
- Collection of observer data;
- Data from neighbouring States (South Africa, Mozambique, Kenya, Tanzania, Somalia);
- Data of vessels licensed; and
- Specific support to national control and monitoring of fisheries centre of the Union of Comoros.

This program is aimed at sustaining MCS activities and ensuring its reliable institutionalization. In addition, smaller regional initiatives established by some countries can be evaluated and expanded, such as the SADC heads of MCS Operation meetings, hosted by the Mozambican Ministry of Fisheries.

There has also been considerable intergovernmental liaison, particularly between some SADC Members, and many concepts have been test driven such as regional multilateral patrols in South Africa, Mozambique, Namibia and Tanzania. These joint patrols have highlighted the multilateral requirement for harmonized action and forged contact on an operational and political level between countries.³⁸ The participation of Tanzania in surveillance missions shows the commitment that unites the region in its efforts to combat IUU fishing. It is also noted that traditionally MCS in the ESA-IO region has focused mainly on industrial fisheries, but as artisanal fisheries may well reach similar total landings as larger fleets, these small-scale fisheries have also been included on the overall MCS approach. Close collaboration with SWIOFP, SWIOFC,

and SADC has been forged.

Although many fisheries data collection systems are in place in the region, there is little coordination, except through FAO, IOTC and a lesser extent SWIOFC. In the broader regional context, no such data-sharing initiative exists at present. This too presents a great opportunity for strengthening regional cooperation and sharing of resources in collective fisheries management. The Programme also addresses flag State and port State measures in relation to MCS and its objectives.

With the financial support of the IOC, a fishery monitoring centre, based in Moroni, ensures follow-up missions and capacity building in fisheries activities in Comoros EEZ. Five fisheries inspectors regularly participate in regional missions to address issues related to IUU fishing with the aid of patrol vessels. Since 2009, there have been extensive annual registration campaigns to register artisanal motorized fishing boats as a means to evaluate the economic and social importance of artisanal fisheries sector in the Comoros.

The IOC implements its regional strategy for surveillance of fisheries through the regional plan for fisheries surveillance. The plan aims to improve the capacities of the Indian Ocean countries to develop, adopt and implement MCS strategies. The plan should strengthen existing national efforts through pooling of resources, improved co-ordination and data sharing. The measures implemented through the strategy include a ban against transshipment at sea and denial of access to ports for vessels that have been blacklisted by any RFMO, or that which is not included on the “white list” of registered vessels. Measures also include harmonization of national legislation against IUU fisheries, and setting fines at a level that deter illegal activities. MCS training has also been conducted, including a module development workshop to address the MCS capacity needs of members of the IOC.

4.5.3 Southern African Development Community (SADC)

SADC aims to achieve regional integration and eradicate poverty within the Southern African region. SADC Member States signed the Protocol on Fisheries in 2001 which entered into force on 8 August 2003 and emphasizes the responsibilities of Member States, international relations as well as the effective management of shared resources. The East African States with membership in SADC are Mauritius, Mozambique, South Africa, and Tanzania.

The objectives of the Protocol on Fisheries are to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems of interest to State Parties in order to:

- promote and enhance food security and human health;
- safeguard the livelihood of fishing communities;
- generate economic opportunities for nationals in the region;
- ensure that future generations benefit from these renewable resources; and
- alleviate poverty with the ultimate objective of its eradication.

By signing the SADC Protocol, the Member States agree to harmonize their domestic legislation with particular reference to fisheries and the management of shared resources, to take adequate measures to optimize fisheries law enforcement resources in order to protect aquaculture and the aquatic environment

and safeguard the livelihood of fishing communities.

Within SADC, activities related to the establishment of effective cooperation on MCS among the SADC coastal Member States have been undertaken. A Regional Fisheries Monitoring project funded by the African Development Bank is ongoing. The SADC Regional Fisheries Monitoring project seeks to develop a regional MCS strategy and regional plan of action in relation to IUU fishing. Regional MCS activities are to be coordinated at the SADC MCS Centre based in Maputo, Mozambique. Among the regional activities are enhanced information sharing, the development of a regional fishing vessel register, and regional VMS framework. It is also envisaged that national capacity for MCS activities among member states will be improved.

Under the regional initiative the intention is to improve regional and inter-regional cooperation with a view to eradicating IUU fishing; strengthen fisheries governance and legal frameworks to eliminate illegal fishing; develop a regional MCS strategy and a regional plan of action in relation to IUU fishing; and strengthen fisheries MCS capacity.

On 4 July 2008, the 'SADC Statement of Commitment on IUU Fishing' was signed by Ministers at the Ministerial Conference and it was later endorsed by the SADC Summit. This commitment was followed by various implementing actions:

- Strengthened and successful implementation of SADC coastal State laws relating to IUU fishing;
- Strengthened policy and legal frameworks to address the issue of IUU fishing; • Stop illegal Fishing – established to support this process was deemed a success; and
- SADC IUU Fishing Task Force was appointed in 2011.

Part of the Stop Illegal Fishing campaign is the first-ever multilateral patrol involving four neighbouring countries of South Africa, Mozambique, Tanzania, and Kenya.

Monitoring the landings of IUU vessels has dramatically improved in South Africa and in other ports in countries that are signatories to the SADC Fisheries Protocol. SADC countries have signed a protocol on data exchange which has not been implemented due to technical difficulties and the low number of countries with fully functioning VMS systems. In the broader regional context, no such data-sharing initiative exists at present. This presents an opportunity for deepening regional cooperation and sharing of resources in collective fisheries management.

4.5.4 East African Community (EAC)

The EAC aims at widening and deepening cooperation among the Partner States in, among others, political, economic and social fields for their mutual benefit. The ESA-IO which are Members of the EAC are Kenya and Tanzania. Under the ACP Fish II programmes, the objectives include:

- Improved fisheries policies and management plans at regional and national levels;
- Reinforced control and enforcement capabilities;
- Reinforced national and regional research strategies and initiatives;
- Developed business supportive regulatory frameworks and private sector investment; and

- Increased knowledge sharing on fisheries management and trade at regional level.

A summary of membership and participation in these regional organisations, arrangements and initiatives is presented in Table 4. Not all East African States are members of the same organisations and arrangements or participates in the same initiatives creating competition for similar resources, lack of harmonized activities, and overlapping functions.

Table 2: Membership and Participation in Regional Organizations, Arrangements and Initiatives

Country	SWIOFC	IOTC	SIOFA	Fish-I	IOC	SADC	ESA
Comoros	X	X	-	X	X	-	-
Kenya	X	X	-	X	-	-	X
Madagascar	X	X	-	X	X	-	-
Mauritius	X	X	X	X	X	X	-
Mozambique	X	X	-	X	-	X	-
Seychelles	X	X	X	X	X	-	-
South Africa	X	CNCP	-	-	-	X	-
Tanzania	X	X	-	X	-	X	X

(X) Member (-) Not a Member or does not participate (CNCP) Cooperating Non-Contracting Party

4.6 Regional Cooperation in Fisheries

There are many reasons for East African States to cooperate in establishing a regional MCS system, particularly where the States have a rich marine resource base that is vulnerable to IUU fishing. Regional cooperation among the East African developing States can yield: the exchange of fisheries data for MCS and fisheries management purposes; harmonized legislation; extradition agreements; cost savings and increased negotiating power; implementation of the flag and port State control agreements; and combined measures to address IUU fishing activities. In practice, the cost of implementing MCS measures is often a decisive factor in encouraging States to join sub-regional and regional MCS initiatives.

Regional or sub-regional cooperation will often be more successful when:

- there exists an overall regional policy supporting MCS cooperation;
- there is an existing organization that will serve the purpose;
- the States in the area have a common interest in fisheries;
- there is a common language and/or cultural ties;
- fish stocks are shared;
- maritime boundary delimitation issues between the States in question have been resolved or pending resolution, the States involved are willing to cooperate; and
- the political ideologies and policies of the governments are either compatible or well understood and respected.

Regional cooperation will also create additional responsibilities, including: the security of sensitive data; how differences between the participating States will be resolved in order to present a unified regional position; and how to take into account the difference in the economic situations of potential member States when devising cost-sharing arrangements to support an international organization.

Fisheries-related instruments, both at the international and regional levels combined have not only created

a broader range of international obligations, standards, and approaches to which fisheries laws are intended to aspire, but they have also generated comprehensive new standards and approaches to how fisheries laws, including in relation to MCS, are to be drafted. Harmonization of these national approaches will help achieve the socio-economic objectives of the wider African region.

4.7 Bilateral Cooperation and Fisheries Partnership Agreements

East African States such as Comoros, Madagascar, Mauritius, Mozambique, and Seychelles have entered into bilateral agreements with the EU for purposes of fisheries access. This bilateral agreement is now called the Fisheries Partnership Agreements (FPAs) where the EU provides financial and technical support in exchange of fishing rights. FPAs comprise two parts: access rights to the EEZ and sectoral financial support. The sectoral support promotes sustainable fisheries development in the partner countries by strengthening their administrative and scientific capacity through sustainable fisheries management and MCS. The protocols to the individual FPAs contain provisions relating to MCS tools such as authorization to fish, terms and conditions for licences of both fishing and support vessels, record of vessels, recording and communication of catch, fishing gear specification, landing of catch, transshipment of fish, VMS, scientific observer program, application of sanctions, arrest and detention of vessels, information exchange, and settlement of arrest and detention of vessels.

4.7.1 Recommendations on Regional MCS

Encourage the implementation of relevant provisions of 2014 policy framework and reform strategy for fisheries and aquaculture in Africa

Determine sub-regional priorities in MCS implementation that transcends different memberships and participation in various regional organizations and arrangements

Develop specific sub-regional strategic actions on fisheries consistent with the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa

Strengthen sub-regional cooperation on MCS amongst East African States by:

- Establishing formal arrangements and protocols between regional fisheries bodies and arrangements with policy and management functions (i.e. SIOFA, SWIOFC, and IOTC) that will facilitate exchange of information on IUU fishing and data obtained from MCS tools
- Developing joint initiatives between regional fisheries bodies and arrangements and RECs (i.e. SADC, EAC) involving East African States by exchanging information that will achieve common fisheries objectives
- Adopting policy measures within the purview of RECs to encourage cooperation against fisheries crime
- Adopting lessons learnt from successful fisheries programs such as FISH-i Africa and IOC's SmartFish at the sub-regional level
- Engaging in MCS activities with other States of the region
- Conducting regional training on both the legal and practical aspects of Vessel Monitoring System and Observer Program to facilitate cooperation among legal and technical personnel

- Ensure that any formal arrangement that will be developed within the East African sub-region have provisions that will enable wider cooperation with other African sub-regions
- Investigate how the planned SADC Regional Fisheries MCS Coordinate Centre can facilitate MCS cooperation in the East Africa
- Develop functional bilateral cooperation in fisheries in shared areas and maritime zones pending maritime boundary delimitation agreements
- Incorporate provisions of fisheries partnership agreement and other bilateral cooperation arrangements in domestic legislation

Lesson and best practices for sustainable cost effective financial mechanisms for functional MCS regional system in shared ecosystems

5 NATIONAL/DOMESTIC FRAMEWORKS FOR MCS SYSTEMS

The basis for any fisheries management and MCS regime is a robust legal framework. A modern, comprehensive fisheries law, consistent with rights and obligations under global and regional fisheries agreements and internationally recognized “best practice” models would be expected to incorporate key principles of fisheries management such as ecosystem approach to fisheries, precautionary approach to fisheries, environmental impact assessment, effective data collection and management, and effective MCS. With respect to MCS, fisheries legislation would need to have provisions on the following matters:

- the authorisation of, powers, functions and duties of inspectors, authorized officers and observers (including powers to search, seize items, require vessels to go to port, etc);
- establishment of observer schemes, port State inspection schemes, and VMS (including provisions on how these schemes are to be applied);
- establishment of a record of fishing vessels (for both commercial and small-scale fisheries);
- complementary licensing controls, including authorization to fish on the high seas;
- data collection and submission, including confidentiality of information;
- judicial proceedings for fisheries offences and treatment of evidence, including electronic evidence; and
- application of administrative and criminal sanctions, as applicable.

Domestic legislation plays an important role in the effective development and implementation of MCS measures. Apart from providing for the powers of authorized officers, the key roles of domestic law include increasing regional and international cooperation in order to reduce the incidence of IUU fishing, increasing the transparency of fishing activity by improving monitoring programs, particularly through VMS; identifying enforcement issues relating to maritime boundaries and delimitation; facilitating the use of information derived from monitoring and surveillance to promote compliance; and promoting safety procedures for fisheries officers in undertaking MCS-related functions.

5.1 Report on MCS Systems in Eastern African Countries

The MCS report is on MCS in Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania are examined below.

5.1.1 Comoros

Fisheries in Comoros is mainly artisanal using deep handline fishing. In addition to this small-scale fishery, there are also longline and purse seine industrial fishing targeting tuna for export. Fish catch is estimated at 162,000 tonnes per year with an estimated value of 14.7 million contributing about 8 per cent to national GDP and 5 per cent to foreign exchange.

The Fisheries Administration of Comoros is under the supervision of the Vice President in charge of Production, Environment, Energy and Handicrafts. The General Directorate of Fisheries Resources deals with fisheries planning and regulation while the Centre for Fisheries Monitoring and Control is responsible for MCS operations in the country.

Comoros does not have a proper fisheries policy as the sector is addressed under the agricultural policy. Through the assistance of the FAO, a fisheries legal framework and national development strategy has been developed for Comoros. Due to the lack of availability of relevant legislation and documents in the English language, very little assessment on the legal framework was conducted in this project. However, the study conducted by IOC SmartFish Programme on the MCS capacity assessment for the Eastern and Southern African region of the Indian Ocean reported that a pilot project has installed a VMS system, which aims to monitor the tuna fleet in the Comoros, but is not functioning due to technical difficulties. The ports of Comoros are also relatively underdeveloped which are only suitable for small vessels. The IOC SmartFish report on MCS Capacity Assessment also presents numerous gaps in the MCS framework of Comoros and suggests that there are very limited MCS tools in the country, focusing mainly on the licensing of industrial offshore fishing sector and semi-industrial shrimp fishery.

Although some MCS tools have been adopted by Comoros such as vessel registration and licensing, such measures may be improved such as the implementation of stricter conditions for fishing activities. Capability for boarding and inspection, as well as air and sea surveillance assets can also be increased. The lack of supporting legislation has been identified in the survey as a major impediment to the effective adoption and implementation of MCS in the country.

A copy of Comoros fisheries related legislation in English was not obtained, hence the analysis is only limited to available information found in secondary references and the survey response.

5.1.2 Kenya

Kenya's marine fisheries contribute on average 4 per cent of the total national fish landings. The inshore marine fish species are mainly exploited by local fishers, while the offshore resources outside the territorial waters are exploited mainly by distant waters fishing nations. Foreign access to Kenya's tuna resources has been regulated through direct licensing since 1996 to date. Kenya has licensed EU and Asian purse seiners and longliners (Spain, France, China, Indonesia, and Japan). Only a small quantity of catch from the EEZ is landed in Kenya, primarily tuna loins for processing for export.

The development, utilization, conservation and management of Kenya's fisheries resources is governed by the Fisheries Act 1989, as amended in 1999. Fisheries management in Kenya takes a participatory

ecosystem approach. The main fisheries management systems include an open-access fishing regime as well as Co-management, where resource users are involved in the decision-making processes, the implementation of fisheries measures collectively decided upon, and enforcement. The government also involves the fishing community in the licensing process, where only those who adhere to the rules are cleared by the Beach Management Units to be licensed. Participatory approaches to fisheries management emphasize ownership of the fisheries resource by the resource users. Consultative activities with fishers and other stakeholders and interested groups are encouraged when developing policies and legislation to manage fisheries resources.

Under Kenyan legislation, foreign fishing vessels are not allowed to access the territorial sea and are limited to the part of the EEZ between 20 and 200 nautical miles. Important conditions are attached to the access permits requiring the captains of the vessels to fit the vessels with VMS and provide information on their fishing, the fish catch on board at intervals of one week, make it possible for government officers to be able to board their vessels. They are also required to report on any nontarget fish species or other marine organisms, particularly marine mammals and turtles incidentally caught and returned to the water, as well as the total bycatch landed or discarded at sea.

There is no fully functional MCS unit in Kenya. Currently, no surveillance of Kenya's EEZ is carried out. However, a marine fisheries MCS strategy and action plan has been developed under the Kenya Coastal Development Project. In addition, the Fisheries Management and Development Bill of 2012 ensures that MCS is entrenched as it creates the Kenya Oceans and Fisheries Advisory Council. A training manual for MCS working groups at the operational level has also been developed. The MCS strategy for Kenya aims to pursue clearly defined objectives, namely:

- promoting an effective institutional and legal framework for an operational coastal and offshore MCS system;
- promoting responsible and sustainable utilization of the coastal and offshore fisheries resources; and
- strengthening MCS infrastructure and human resource capacity.

An observer scheme has not been introduced in Kenya, however earlier preparations were made in the early years of 2010 by training observers under the Southwest Indian Ocean Fisheries Project. The main challenge is that the current authorized vessels are too small to accommodate observers. The observer scheme has not been developed because the fishing fleet is artisanal of length overall less than 24 meters. Field observation of artisanal catches commenced in 2013 covering about 20 small fish landing sites across the entire shorelines with sufficient sampling frequency.

Even though Kenya has developed standard operating procedures to implement the EU IUU regulations and its obligations and commitments under regional fisheries bodies and arrangements, there are very few regulations implementing the Fisheries Act 1989, including port State measures, VMS, appointment of authorised officers and observers, and fisheries enforcement.

5.1.3 Madagascar

Madagascar has three main fisheries sectors, namely traditional, artisanal and industrial harvesting a total of 142,000 tonnes in 2005 (including aquaculture). Fisheries contribute to GDP at 8 per cent with a value of fisheries at USD160 million. Shrimp and tuna are the key export commodities of the country.

The Ministry of Fisheries of Madagascar is the agency responsible for fisheries management. Enforcement and surveillance are the responsibility of the Centre for Surveillance of Fisheries which operates under the authority of the Minister.⁶¹ The Centre is equipped with a control centre in Antananarivo and satellite stations in Mahajanga and Antsiranana which equipped industrial fishing vessels with VMS. There are two offshore patrol vessels, a coastal patrol, a set of zodiacs for inshore and lagoon patrols and 4x4 vehicles for coastal patrols. The Centre conducts surveillance operations at sea and within ports, as well as a scientific observer program. It also monitors catches, collects scientific data, and records compliance by vessels. These MCS measures though are only applied to the shrimp and tuna fisheries and not to artisanal vessels. The MCS system is funded almost entirely from the contribution of the EU Fisheries Partnership Agreement with Madagascar. Random at sea inspection and establishment of check points may further address illegal fishing activities.

The fishing vessel licensing system in Madagascar implements strict terms and conditions such as area and species restrictions. Penalties for breach of licensing conditions include the withdrawal or suspension of license and confiscation of vessel, fishing gear or catch. A system between fishing vessel registration and licensing exists although coordination between relevant agencies can be improved and procedures need to be well-defined. Madagascar also follows strict port State measures for foreign vessels and catch certification system to comply with EU IUU Regulations.

A copy of the Madagascar fisheries law in the English language was not obtained, hence the analysis is only limited to available information found in secondary references and the survey response.

5.1.4 Mauritius

Mauritius EEZ has stock of various fish, including pelagic and demersal species. The island-based artisanal fisheries, the offshore demersal fishery of the banks of the Mascarene Plateau and the Chagos Archipelago, and the tuna fishery in the Western Indian Ocean are the fisheries resources exploited. Catch quotas for the banks fisheries have been imposed since 1994 and the number of vessels operating on the smaller banks is limited through a licensing system. Fish is an important source of protein in the local diet and the per capita consumption of fish stands at 20 kilograms (representing one quarter of animal protein intake). The fisheries sector accounts for one percent of GDP and employs some eleven thousand people.

Although local production does not suffice to cover market needs, it provides employment and returns for inhabitants of coastal regions. The government encourages lagoon fishermen to venture into the outer reef fisheries to fish around Fish Aggregating Devices (FADs) maintained and renewed by the government. The tuna fishery which is the major industrial fishing sector of Mauritius exploits the tuna fishery of the South West Indian Ocean. Land transshipment constitutes a very important related activity. The total fish harvested annually in Mauritius is estimated to be about 7,829 tonnes in 2010 with fisheries contributing about USD622 million, representing 1.3 per cent to the GDP (2010).

Mauritius offers a platform for the transshipment, warehousing, handling, processing and re-export of fish and fish products. Port Louis is an important transshipment base with good port and storage facilities for tuna. Tuna canning commenced in 1972. To date, Mauritius has been very successful in developing a thriving tuna cannery sector. The export of canned tuna yielded €209 million in 2009. A total of €140 million a year is generated in port revenue and a similar amount from tuna processing export earnings. Asian tuna longliners are landing or transshipping an average of 17,500 tonnes of tuna annually. Fishing agreements are in place with the EU, Seychelles (on a reciprocity basis) and Japan for fishing within the Mauritian EEZ. All foreign vessels need to have a licence to fish in Mauritian waters. Local investment and joint ventures are also encouraged in tuna fisheries.

The Fisheries and Marine Resources Act 2007 provides for licensing of local and foreign boats and vessels. Local boats or vessels are also required to be registered prior to the issue of fishing licenses. The major IUU activity in Mauritius is potential poaching from unlicensed foreign vessels and illegal transshipment of tuna catches at sea in order to conceal the origin of the fish.

The MCS system in Mauritius involves the Fisheries Management Division and the Fisheries Protection Service, National Coast Guard (NCG), Mauritius Port Authority and the Ministry of Information and Communication Technology. All licensed boats and vessels are required to be VMS compliant and may be requested to carry observers. The Ministry of Agro-Industries and Fisheries has recently negotiated a protocol for the satellite monitoring of EU vessels fishing in the EEZ. A VMS was set up in 2005 with the following objectives:

- to assist in the identification of vessels fishing illegally without license in Mauritius;
- to identify licensed fishing vessels that may be fishing in contravention of their licence conditions;
- to monitor the activities of Mauritian flagged vessels operating within the EEZ of other countries; and
- to provide a comprehensive record of the activities of all fishing vessels that wish to land fish in Mauritius for subsequent export in part fulfilment of Mauritius' port responsibilities.

The VMS is being managed by a Fisheries Monitoring Centre (FMC) based at the Albion Fisheries Research Centre. The FMC is able to have near real time positions of the vessels, their course and speed. This information provides an important tool in the monitoring the activities of the licenced vessel. The National Coast Guard is also equipped with an FMC Workstation to enable data to be obtained from the main FMC for policing purposes.⁷³ The setting up of VMS has necessitated the promulgation of relevant regulations to make it mandatory for all licenced fishing vessels to be equipped with transponders that will send their GPS position every two hours to the FMC.

The Ministry of Fisheries in Rodrigues has adequate land-based infrastructure and facilities needed to carry out MCS operations: with office space, computers and internet available, as well as satisfactory transport. The Ministry lacks patrol vessel capacity but recent regional cooperation with IOC MCS project has contributed to an improvement. Three aircraft provide air patrol. Eight officers were trained as observers, five under the SWIOFP and the other three under the IOC MCS project. Trained observers to embark on board foreign and local fishing vessels are under consideration.⁷⁴ All foreign fishing vessels calling to Mauritius ports are inspected upon arrival and during offloading. The MCS workforce consist of 286 people

including 11 Fisheries officers, 2 Customs officers, 2 Health

The fisheries legislation of Mauritius is supported by a number of regulations not only on MCS but also fisheries management as a whole, which presents a good framework for an effective implementation of MCS. Some of these regulations also set out characteristics of activities that may be considered illegal fishing for the purpose of enhanced enforcement. These regulations, which implement specific sections of the Fisheries and Marine Resources Act 2007 are on toxic fish (2004), prohibition of the use of hooks of small size (2011), the extension of net fishing season (2012), export of fish and fish products (2010), import of fish and fish products (2012), fishing of sea cucumbers (2012), license and fees (2013), and marine protected areas (2007). There is specific MCS regulation on vessel monitoring systems (2005); however, no other regulations have been found on other key MCS measures such as observer programmes, port State measures, catch certification, and boarding and inspection.

5.1.5 Mozambique

Mozambique has rich fisheries resources, which are divided into marine capture, inland capture, and aquaculture. Marine fisheries account for more than 90 percent of the total fisheries production with an average annual catch of about 120,000 tonnes, 80 percent of which are caught by artisanal fishers. The main marine resources compose of crustaceans (prawns, deepwater shrimp, crayfish, lobsters, and crabs), marine finfish (demersal and pelagic species mainly grouper, snapper, emperor and sea bream also high migratory tuna species of yellowfin, big eye and albacore, swordfish and shark) and cephalopods and molluscs (squid, octopus, sea cucumbers, bivalves), which are of great commercial value and most of which are bound for the export market. EU remains the largest market for Mozambican fishery products. Even though there is a significant catch by artisanal vessels, foreign fishing access is also a critical aspect of the fisheries development of Mozambique.

The legal basis of the Mozambican fisheries is the Fisheries Law 3/90 which provides for a fisheries management regime based on total allowable catch and quotas and limited entry regulations through licensing and effort allocation. There are also specific regulations on closed seasons and mesh size. The management measures are revised on a regular basis using results of stock assessment and economic performance of fleet.⁷⁹ The Fisheries Regulations Decree 43-2003 not only contains details on input and output control and technical fisheries conservation measures, but also provides requirements on vessel construction, marking of fishing gears, vessel charter for both Mozambique and foreign vessels, and data collection. Specific MCS regulations are also available such as licensing for artisanal, semi-industrial and industrial fishing vessels, authorisation to fish on the high seas, transshipment in port or at sea, departure from Mozambique waters, port entry and departure, landing of fish by foreign vessels, inspection of vessels, and port State enforcement. Regulations are also available on the monitoring of fishing activities which are mainly conducted through daily fishing logbooks, catch reports, satellite-based VMS, and embarkation reports. In the Fisheries Regulations Decree 43-2003, there are also general obligations of vessel masters with respect to allowing embarkation officers to perform their duties.

Under the Mozambique fisheries law, the Fisheries Management Commission is the consultative body of the Fisheries Administration that provides advice on fisheries conservation and management. A Fishing

Co-management Committee was also established as the participatory management forum at local, district and provincial levels.

Within the framework of the Fisheries Cooperation Programme between Mozambique and Norway, the Nordenfjeldske Development Services (NFDS) has established a permanent presence in Mozambique since 2006. It provides fisheries MCS experts to the Ministry of Fisheries to assist in the coordination, planning, delivery and training to implement the National MCS Strategy. As a result, Mozambique has been a key player in other projects such as FISH-i Africa. Mozambique is also to be the host country for the SADC Regional Fisheries MSC Coordination Centre. This regional centre's mission will be to coordinate fisheries MCS and enforcement activities, set up a platform for the implementation of a regional Patrol Plan, support capacity building for implementation of the SADC Protocol on Fisheries, and develop training modules.

Mozambique is currently enacting an updated fisheries legislation, however as the copy obtained is not in the English language, this Technical Report has not included an analysis of the new law.

5.1.6 Seychelles

Seychelles has an extensive EEZ and is located in a rich tuna belt. It has developed to become the regional hub for industrial tuna fisheries and is also host to the IOTC. The contribution of fisheries-related activities in Seychelles to GDP and foreign exchange exceed that of tourism, while exports of fishery products account for over 97 per cent of all exports. The development of industrial tuna fisheries has encouraged the development of infrastructure for reception and handling facilities for fisheries in general. Port Victoria is the principal tuna transshipment port in the region.

Seychelles is the main base for EU tuna purse seiners in the western Indian Ocean, mainly French and Spanish, with a well-developed supply chain for tuna resources. The EU purse seiner fleet makes contributions through the FPA, private licenses and other related payments and vessel expenditure in Victoria. The tuna fishery is managed regionally through the IOTC. Overcapacity in the artisanal fishery appears to have caused overexploitation in some areas. The main IUU activities in the artisanal fishery are fishing during closed season and use of unlicensed fishing gear. There is also potential illegal fishing by foreign unlicensed vessels in the tuna fishery including transshipment at sea; under reporting by licensed fishing vessels; and non-compliance by Seychelles flagged foreign vessels.

The sustainable management of marine resources in Seychelles is the responsibility of the Seychelles Fishing Authority as stipulated in the Fisheries Act 2001. Seychelles fisheries are managed through licensing of vessels. In the industrial fishery effort controls are applied through entry limitation. The artisanal fishery is open access and excess fishing effort, especially in inshore areas, has led to localized over-exploitation. Other regulations include shark finning (2006) and whale shark protection (2003). The country also has legislation on the control of foreign fishing vessels (Control of Foreign Fishing Vessels Decree 1979). Under these regulations, no foreign vessel is allowed to fish in the Seychelles EEZ without a licence, and is required to stow its fishing gears unless provided a license to fish. Overall, both domestic and foreign vessels are required to follow strict and specific licence conditions. The regulations also provide for the powers of authorized officers such as boarding and inspection, and contain provisions on the forfeiture of

catch and provision of a satisfactory bond upon detention. Apart from the fisheries legislation, Seychelles also enacted a law on the export of fishery products (Chapter 77A) and adopted an export of by-products regulations which mainly focuses on quality and food safety and not on catch certification for purposes of prohibiting the trade of fish derived through illegal means.

The Seychelles Fishing Authority has good infrastructure and facilities conducive to carry out MCS operations. MCS is the responsibility of the MCS section of the Fisheries Management Division of the Authority. The MCS section ensures compliance with the provisions of the Fisheries Act 2001 and implementing regulations. The Fisheries Monitoring Centre monitors the movement of licensed fishing vessels and foreign vessels flying the Seychellois flag through the use of a satellite dependent VMS since 2002.

The FMC also processes catch report data; authorizes the landing of catch outside Seychelles' waters; and ensures that the licensing unit maintains an updated register of licensed local and foreign fishing vessels. Seven enforcement officers (inspectors) carry out the daily enforcement of national laws; inspecting vessels for compliance and perform patrols within either national or regional areas alongside the National Coastguard who provide the patrol equipment together with a leased fisheries patrol vessel. These MCS measures are also implemented as part of Seychelles' obligations under regional fisheries management agreements. The country also implements a catch certification system based on EU and regional requirements.

The MCS department of the Seychelles Fishing Authority consist of 22 people. Seven are inspectors, 5 observers are employed for the industrial tuna fishery, and 5 officers are working in the FMC, 2 officers deal with licensing and 3 officers work with the VMS. Training is a priority for SFA and basic courses are provided ad-hoc in relation to law, VMS operations, and inspection procedures.

5.1.7 South Africa

South Africa has a long coastline and vast EEZ that is home to a rich diversity of fisheries resources. In 2007, the reported fish production in South African waters exceeded 600,000 tonnes with a value of more than USD200 million dollars in net fish exports. Because of the different ecosystems and irregular coastline, South Africa's marine fisheries are diversified both with respect to species caught and gear deployed. There are 22 commercial fisheries, but the small pelagic fishery is the largest by volume and forms the bulk of fish production. Per capita fish production in South Africa is relatively low and most of the fish is processed and exported. Although fisheries play an important role in coastal economies, the contribution of the sector to the national GDP is comparatively small. The country's marine resource management program is divided into four fishing sectors: offshore and high seas, small scale, recreational fishing, and inshore.

The legal basis for fisheries management in South Africa is the Marine Living Resources Act 18 of 1998. It provides for the conservation of the marine ecosystem, the long term sustainable utilization of the marine living resources and access to exploitation, utilization and protection of certain marine living resources in a fair and equitable manner. The Act provides the comprehensive framework for the determination of allowable catch and priority fisheries and fishing areas, as well as the licensing regime for local, foreign and high seas fishing. The country has adopted a number of regulations implementing provisions of the Act,

such as on marine recreational fishing, use of fishing harbours, levy on fish products, and fishery-specific regulations. South Africa has also enacted a number of relevant environmental and biodiversity legislation, particularly on seabirds and seals and marine protected areas. Draft regulations on small scale fisheries are currently undergoing public consultations.

Fisheries is one of the key functions of the Department of Agriculture, Forestry and Fisheries. The Marine Living Resources Act establishes various institutions that will ensure that the country meets its socio-economic and management objectives such as the Fisheries Transformation Council. The Department has several directorates that have specific responsibilities related to fisheries.

South Africa has an established MCS program which implements the Marine Living Resources Act 18 of 1998 and has three key components: Compliance, Monitoring and Surveillance, and deployment of Fisheries Protection Vessels. Unlike in other States in East Africa, South Africa has a monitoring and compliance program for specific fisheries such as hake longline, hake trawl, hake handline, abalone, shark longline, swordfish longline, toothfish, small pelagic purse seine, West coast, nearshore, offshore and South Coast rock lobster, traditional linefish, squid, and recreation and subsistence fisheries. Monitoring and compliance is conducted by fishery control officers who have the power to inspect local commercial fishing vessels at landing sites, as well as foreign fishing and fish carrier vessels. Their responsibilities include verifying if fish quota allocation is not exceeded, checking compliance with terms and conditions of a fishing licence, verification of relevant documents during inspection, confirming if vessels are carrying a functional VMS transmitter onboard, monitoring of catch during offloading and transshipment. These officers also ensure that vessels comply with relevant RFMO conservation and management measures. They also detect serious offences and issue fines for minor offences; otherwise, serious and repeated offenders are referred to the enforcement committee. Fishery control officers also check by-catch against the total hake landings and every import and export documents, health certificates and certificates of origin. As part of intensifying enforcement efforts, South Africa conducts inspections on fish processing establishments to determine legality of fish, conduct coastal patrols, road blocks and vehicle control points and inspect restaurants and fish shops for illegal catch.

The Monitoring and Surveillance Directorate (which was previously the Special Investigations Unit) was established to investigate and persuade prosecution of high-profile offenders and syndicates contravening the provisions of the fisheries law. The Monitoring and Surveillance directorate places great emphasis on individuals in the fishing industry including organized crime syndicates. The Unit is authorized to undertake investigative operations both on a national and international level and is not bound by any area of jurisdiction. The Monitoring and Surveillance Directorate has operational relationships with other law enforcement agencies such as the National Prosecuting Authority, Organized Crime Unit, Asset Forfeiture Unit, South African Revenue Services, South African National Defence Force, South African National Parks, and South African Police Services, as well as improving ties with regional and international law enforcement agencies.

The Directorate for Fisheries Protection Vessels has been operational in the South African EEZ since 2005. Three of the four vessels patrol the inshore waters, while the fourth one patrols the high seas and the remote reaches of the South African EEZ. The FPVs conduct fisheries inspections at sea, from as far as the

border of Orange River, in the Atlantic Ocean, extending to the Indian Ocean to as far as the Mozambican Border. The Directorate conducts joint patrols with SADC countries. This Directorate operates an intricate vessel monitoring system that has been operational since 2000.

5.1.8 Tanzania

Fisheries in Tanzania contribute 1.3 per cent of the national GDP, and they provide 347,166 metric tonnes (MT) in 2010. This total comprises 52,683 MT from the marine sector. Both artisanal fisheries and industrial fisheries are represented. Fish contributes to 27 per cent of the total animal protein consumption and about 2.9 per cent to the GDP in the country. Since 1998 to date, the Government of Tanzania has been licensing foreign purse seines and longline vessels, including EU and Japan under private licenses to fish in its EEZ. The main IUU fishing problems in Tanzania include dynamite fishing, coral mining along the coast, and incursions of non-licensed Asian and European tuna fleets into the Tanzanian EEZ.

The Fisheries Act No. 22 of 2003, an Amendment of the Fisheries Act No. 6 of 1970 is the main legislation for fisheries management which provides for the power of the Minister of Livestock and Fisheries Development to impose conditions relating to traditional fishing, registration and licensing of fishing vessels, of fish, area and season closures, prohibition of fishing in designated areas, monitoring capacity of the fishing fleet, landing of fish, and trade in fish. Part IX of the Act also lays down fisheries offences and corresponding penalties. The Act similarly provides for the creation of a Surveillance Unit with the officers having powers to board and inspect fishing vessels, direct the master of fishing vessels to stop fishing, inspect documents and direct vessels to come to port or a landing station. Such officers have the power to board and inspect vessels, enter premises, and seize or remove fish with or without a warrant. Specific regulations have also been adopted in Tanzania on fishing marine reserves, use of explosives, poisons and water pollution, vessel licensing, and fish quality. In addition, a Beach Management Unit was also established to implement a co-management approach to fisheries management and enforcement.

MCS operations are carried out by the Ministry of Livestock and Fisheries Development through the Directorate of Fisheries Resource Protection. A similar authority of the Revolutionary government of Zanzibar deals with fisheries within the jurisdiction of the islands. The Deep Sea Fishing Authority in Zanzibar is responsible for all MCS activities towards the pelagic (mainly tuna) fishery.

Fisheries management jurisdiction is split between the mainland and Zanzibar. In Zanzibar, the Ministry of Agriculture, Livestock and Natural Resources cover the fisheries sector. There are 26 patrol vessels and 4x4 vehicles that are available for use in freshwater and near coastal MCS. The Deep Sea Fishing Authority operates a monitoring centre which has an operational VMS; however in general the government has limited means to conduct at-sea inspections or investigations. MCS is carried out by 175 people, with 45 dedicated inspectors, 50 observers for the inland and coastal fishery, and 82 people in administrative roles.

5.2 SWOT Analysis of the National MCS Systems: Institutional and Practical Challenges

The lack of an effective legal framework is recognized as an impediment to a fully functional MCS. Although IUU fishing can be addressed by implementing individual flag, coastal, port and market measures, a more comprehensive MCS framework will provide increased benefits to States. Overall East African

States have in place basic legal framework for the adoption of an MCS strategy or program. This legal framework, primarily through national fisheries laws and regulations provide for fisheries management and conservation measures, licensing of vessels and fishing activities, duties and responsibilities of fisheries authorities, enforcement powers, and fisheries offences and appropriate sanctions. One of the main gaps in most East African State fisheries legislation is the development of specific regulations that would detail the implementation of MCS tools, which include vessel registration and licensing, VMS, observer program, boarding and inspection, port State measures, catch certification and other measures.

Amongst the East African states included in this project, South Africa has the most comprehensive legal framework for fisheries in general, and MCS in particular. This is supported by a fully operational MCS unit which takes into account monitoring and compliance of individual commercial fisheries, surveillance operations, including VMS, and at sea inspection and patrols as well as other key MCS tools, such as observer programs, port inspection, and monitoring of trade to ensure that only those which have been obtained through legal means enter the market. Only South Africa conducts MCS activities that address illegal activities perpetrated by organised criminal groups. Other East African States such as Madagascar, Mozambique, Mauritius and Seychelles have relatively updated legislation on fisheries with specific regulations detailing some MCS measures; however, such regulations do not fully implement all global and regional requirements examined in Parts 2 and 3 of this Technical Report. Kenya and Tanzania have more basic MCS fisheries framework in place and very little regulations and evidence of implementation, although Kenya has adopted an MCS strategy and plan. However, the strength of these countries' legislation lies in the adoption of participatory approach to management which may also be used to develop measures that would encourage self-compliance amongst fishers in the absence of other MCS tools. Comoros has the weakest legal framework on and implementation of MCS.

Amongst the global and regional requirements for MCS, the most well adopted measures amongst East African States are vessel registration and licensing, VMS, and boarding and inspection. These States have also adopted regulations for the implementation of these measures. There are a number of countries with observer programs, although the extent, purpose and coverage of such are not clear. On the other hand, most East African States had very few provisions in their legislation on port State measures and catch certification. In terms of operational capacity, South Africa, Seychelles and Mauritius have the strongest MCS operations in the region while Kenya, Madagascar and Tanzania as having partial to weak capacity. Comoros has the weakest MCS capacity.

A number of other challenges are confronted by East African States in developing and implementing MCS systems. MCS requires a legal framework that would take into account each of the elements of monitoring, control and surveillance. MCS strategy and planning should address the nature of a country's fishery, priority issues and IUU fishing and availability of assets. Such framework requires a risk assessment strategy and adequate resources that often take a longer process to develop or attain. Most of the East African States have limited capacity to develop a robust MCS system on their own and confront issues of lack of financial and human capacity. The international legal framework for fisheries is also a complex inter-relationship of ocean, fisheries, environment, trade, labour, and maritime security binding and non-binding instruments whose application may require in-depth analysis through workshops and training of technical officers

implementing MCS measures. The legal implications of arresting and prosecuting foreign fishing vessels using MCS tools such as VMS, observer programs, and port State measures need further understanding at the national level. Within fisheries administrations, MCS competes for resources with other functions such as fisheries research or fisheries management. The use of information collected from MCS tools are also not used effectively in the prosecution of fisheries offenders.

The gaps in the domestic framework on MCS for fisheries, as well as institutional and practical challenges raise a number of opportunities for cooperation amongst East African States, particularly in terms of utilizing existing regional arrangements and initiatives discussed in Part 3, and assistance provided by international organisations such as the FAO in developing a robust legal framework, sharing of fisheries enforcement data, and conducting joint patrols. East African States which have more updated laws and sound MCS strategies may also serve as model framework for those requiring revision of fisheries laws. Table 4 presents the SWOT analysis for the domestic MCS framework of East African States.

Summary SWOT analysis of MSC systems in East and Southern Africa

The following SWOT analysis was developed to focus on the development of the SADC Regional Strategy on MCS.

Strengths

1. Existence of the SADC Regional Economic Community which promotes regional integration and cooperation among member states.
2. An endorsed SADC Protocol on Fisheries – member states agree to harmonize domestic legislation with respect to fisheries management.
3. An approved Implementation Strategy for the Protocol on Fisheries.
4. The SADC Fisheries Program derived from the Implementation Strategy
5. A signed Statement of Commitment to cooperate in the management of fisheries and MCS activities.
6. Development of the SADC Fisheries Program for the development and management of fisheries.
7. Establishment of the Regional MCSCC in Maputo.
8. The SADC Fisheries Policy Brief (2019) can guide the implementation of MCS activities.
9. Completed Financial Sustainability Plan and Finance Model for the Proposed SADC Regional Fisheries Monitoring Control and Surveillance Coordination Centre.
10. The existence of several Regional Economic and Fisheries Bodies mandated to develop cooperation to promote economic benefits and management of the fisheries.
11. Member states have signed the MCSCC Charter

Weaknesses

1. Lack of sufficient national funding to properly implement MCS and fisheries management. .
2. Lack of coordinated national legal fisheries management frameworks for shared fisheries.
3. Lack of equipment and personnel in many states to properly implement most MCS measures - Port State Measures (PSM), patrols, catch data collection, Vessel Monitoring System (VMS) monitoring, Observer and catch inspection schemes

4. Inadequate and uncoordinated vessel registries and vessel access licensing systems in many Member States
5. Lack of electronic databases.
6. Unresolved problems associated with the sharing of information.
7. Inadequate communication systems.
8. Lack of standardized databases for critical fisheries information - Vessel records, Fishing licenses, Infringements, prosecutions, small-scale fishing vessel records.
9. Lack of effective VMS systems and/or lack of coordination of various national VMS systems.
10. Lack of trained personnel to undertake risk assessments
11. Lack of fisheries management plans for many small-scale fisheries
12. Poor implementation of co-management frameworks in many small-scale and artisanal fisheries
13. Lack of regional cooperation

Opportunities

1. Strong policy framework in the SADC in support of improved MCS
2. Mozambique has provided basic facilities for MCSCC in Maputo.
3. There is an MoU between SADC Secretariat and Stop Illegal Fishing (SIF) for an action plan to implement collaboration between Fish-I Africa and the MCSCC.
4. WWF has provided funding to implement the MCSCC in Maputo.
5. World Bank funding is available to improve fisheries management and construction of the MCSCC.
6. Global perception of the seriousness of IUU fishing leading to improved Global cooperation on MCS to combat IUU fishing.
7. Strong international legal frameworks to improve MCS and reduce IUU fishing.
8. Existence of RFMOs to implement strong and coordinated compliance measures.
9. Existence of externally funded programs to promote regional coordination and assist with MCS (EcoFish, Fish-I Africa).
10. Existence of RECs to promote regional integration of fisheries management.
11. Existence of Bilateral agreements to improve fisheries resource use and management.
12. Facilities and programs are available for fisheries law enforcement training (FishForce).

Threats

1. The ongoing expansion in IUU fishing.
2. Sophisticated electronic technology to bypass VMS.
3. Expanding global and local needs for fish products.
4. The poverty of coastal fishing populations and the need to prioritize livelihoods over sustainable resource use.
5. Low GDP of SADC Member States.
6. Corruption in fisheries management.
7. Lack of compliance with RFMO Conservation Management Measures (CMM) by industrial and semi-industrial fishing vessels of some states.
8. Difficulties associated with managing small-scale fisheries.
9. Lack of cooperative frameworks to manage transboundary issues.

5.2.1 Recommendations for regional MCS based on comparative analysis of National MCSS

Review and update domestic fisheries legislation to ensure compliance with global and regional obligations

Develop harmonized national MCS strategies and plans with long-, medium- and short-term objectives consistent with relevant legislation and policies and regional objectives, particularly the

Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa

Include a risk assessment framework within national MCS strategies and plans

Adopt sound regulations on vessel registration and licensing, VMS, observer program, boarding and inspection, Port State Measures, catch certification and other MCS measures

Implement an effective penalty system for fisheries offences which will deprive those that benefit from IUU fishing

Incorporate provisions in legislation allowing cooperation with neighbouring States on MCS matters

Ensure that an MCS system is supported by a compliance and enforcement mechanism

Use participatory management, including co-management and community-based management, as an approach to fisheries compliance, particularly in terms of data submission and incident reporting

Establish formal collaborative arrangements between institutions with fisheries-related functions which will facilitate sharing of relevant information

Conduct legal and technical training to improve human capacity in MCS implementation

6. RECOMMENDATIONS FOR THE ESTABLISHMENT OF REGIONAL MCS

Global and regional cooperation in MCS present an effective solution to addressing challenges in national MCS systems. Cooperation on MCS is necessary for East Africa because not all of its coastal States are financially able to fund their own programmes. Limited operational assets also hinder States from fully monitoring fishing vessel in their waters, hence cooperation at the sub-regional level may also reduce surveillance cost and help reduce IUU fishing. Exchange of information may also help improve the monitoring of vessel movement and fishing activities in the region. Fish do not know or respect national boundaries, hence management of resources and control of fishing activities may be best done at least at a sub-regional level.

A number of Recommendations were raised in Parts 1 to 4 of this Technical Report based on the MCS requirements established at the global and regional levels, as well as the assessment of domestic legislation and best practice. These Recommendations relate to the identification of priority IUU fishing issues and available MCS tools and assets in the East Africa, implementation of global and regional fisheries obligations, strengthening of sub-regional cooperation, and development of harmonized national framework on MCS. While East African States continue to improve their domestic MCS frameworks, steps may be taken collectively to develop a regional or sub-regional framework for MCS.

In addition to those Recommendations, East African States can develop a sub-regional MCS cooperation in East Africa that would implement existing commitments under regional arrangements and initiatives, in particular the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa and could initially focus on the following key elements or activities:

- Development of a model legislation to promote harmonization of laws and regulations;
- Sharing of information, taking into account confidentiality and security of data;
- Financial support for regional or sub-regional MCS; and
- Training and professional development for MCS legal and technical staff.

In obtaining commitment from national governments, it should be taken into account that East African States are in various stages of MCS development and have different capacities for implementation. An MCS Centre for East Africa may be considered, which may either be a physical or virtual facility; however due to cost requirements, the use of existing domestic and regional facilities, such as that of SADC may be explored as an alternative option. The decision to establish an MCS Centre solely for East Africa may also depend on whether or not an African Union-wide MCS program and institution will be created.

6.1. Model Legislation on Fisheries and Sample MCS Regulations

The East African States may develop a model fisheries legislation based on international fisheries instruments, commitments and obligations under regional agreements and arrangements, and national best practices. This model fisheries legislation will reflect modern fisheries management principles, and incorporate provisions relating to sanctions of sufficient severity, MCS measures, compliance, and enforcement. Sample MCS regulations can also be developed to help guide States in developing specific measures. Although some of

the East African States have recently amended their legislation and adopted MCS-related regulations, this exercise will be most beneficial for those States which require assistance in updating their legal framework and useful for future revision of fisheries law. The draft legislative framework can contain the following elements:

1. Introductory section of a fisheries law;
2. Development of fisheries management plans;
3. Giving effect to international obligations and regional commitments in fisheries;
4. Statutory fishing rights;
5. Conservation measures such as marine protected areas;
6. Licensing regime for domestic, foreign, and high seas fishing, including terms and conditions of a license;
7. Control over national on foreign vessels;
8. Record of fishing vessels;
9. Vessel entry and exit requirements in coastal State maritime zones;
10. Vessel monitoring system;
11. Observer program;
12. Transshipment;
13. Port measures;
14. Market related measures;
15. Lacey Act type of provisions;
16. Implementation of the EU IUU Regulations;
17. Enforcement and compliance provisions;
18. Bail and bond issues;
19. Appointment of authorized officers;
20. Fisheries research;
21. Institutional framework;
22. Offences and prohibited fishing methods;
23. Legislative options to combat fisheries crime;
24. Administrative penalties; and
25. Regulations.

6.2 Regional Sharing of Information

Sharing of information is one of the key areas of cooperation amongst States. A number of arrangements exist in the region for the exchange of information, such as fisheries data available in the FAO database, the listing of IUU vessels by RFMOs, information shared through the International MCS network, activities under the FISH-i and SmartFish, and various reports and studies available on the internet. However, for better sharing of information relating to fishing areas, licensing conditions and offenses, flagging history, history of IUU fishing, and other information that may lead to the successful prosecution of illegal fishing offenders across jurisdictions, a more formal arrangement to share such information would be necessary. A formal regional or sub-regional arrangement on information sharing can include procedures for access and transfer of data and a network of similar bilateral data access agreements between East African States, and potential data access with relevant organizations outside the sub-region. The formal arrangement should also include guidelines on the types of data to be shared, the authorities responsible for data access and

sharing, and provisions for the confidentiality and security of information.

6.3 Financial Support of Regional or Sub-regional MCS

A successful MCS framework at a sub-regional or regional level requires adequate funding which may not be readily available to all East African States. A few options, or a combination of options, for financial arrangements, may therefore be considered:

- National governments fund MCS activities in the region through regular contributions from their own budget;
- Contributions from the local or foreign fishing industry;
- Foreign licensing fees or contributions from FPAs;
- Payment from users of MCS services, such as fishing vessels for the use of VMS;
- Host East African State to pay for the cost of an MCS activity held within their jurisdiction; and
- Overseas aid and sponsor organizations.

National contributions may be calculated based on economic position, size of the fishing fleet availing of the MCS service, and other criteria or formula. MCS-related studies may also be funded through international non-government organizations.

6.4 Training and Professional Development

Training of MCS personnel (legal and technical) is important if an integrated system is to be developed that will allow an effective monitoring of fishing activities, at the same time use of MCS data for the arrest and prosecution of offenders. A continuous MCS training program must be used to promote an understanding and the dynamics of changes in the technology used and behavior of the fishers particularly in the following:

- A practical grounding in the concept of MCS to support sustainable fisheries;
- MCS systems, required elements, implications, and suitability for specific situations;
- Legal aspects of technical MCS tools such as VMS and observer programs;
- Practical at-sea and port inspections, reporting, and prosecution matters, such as detection of violations, prosecution, and rules of evidence, some of which are already being conducted in the region; and
- Developing an analytical approach to developing appropriate MCS mechanisms.

MCS training can be conducted at the sub-regional level and replicated at the national level.

7. THE COST OF MANAGING FISHERIES RESOURCES

7.1 Identified Items to be costed for an Effective MCS System

An effective monitoring control and surveillance (MCS) system for a national fishery involves the use of a combination of at least five key factors which must of necessity be engaged simultaneously to make the system operational. These include Vessel Monitoring systems (VMS), Aerial surveillance by aircraft, fishing patrol boats, onboard observers, enforcement, and key specialized personnel. Without any one of these, the efficiency of the others will be greatly compromised to an extent of the system is economically unviable. Regionally other considerations like appropriate institutional, capacity, policy national and international laws, and regulatory arrangements need to be in place to make the system function optimally

7.1.1 The VMS System

At least for states riparian to a waterbody, which could be a big river, sea, or a large ocean with fisheries resources, may require setting up of a Vessel Monitoring System, an Observer programme, and Aerial surveillance. The VMS will coordinate signals from at least 200 or more which will be the number of vessel-operating in the area. The system should be compatible with other regional VMS, especially those used with member countries of the region which runs a reporting system on vessels and is used to ensure that any other vessels not registered with it do not land their catches in any of the ports registered with like IOTC ostensibly to prevent IUU fishing in the particular water body. A system for deep sea 200 nautical miles into to Exclusive Economic Zone EEZ will require a more elaborate plan as this would link it to other VMS systems.

7.1.2 Patrol Aircrafts

A VMS is not be as effective as would be required as a deterrent to the EEZ vessel from fishing in that area of a coastal state unless it is backed by aerial surveillance. In order to implement an effective aerial surveillance system, it needs to purchase a fisheries patrol aircraft or unmanned vehicle that is specifically dedicated to the purpose. Such a plane or drone would be fitted with adequate observatory facilities to be able to scan a sizeable radius of the sea as it flies around. Usually, a fishing vessel patrol aircraft will operate randomly once or twice a week due to the high operation costs, but it would accurately observe vessels in the EEZ of a country and also check with the VMS at the control base to ensure that their VMS are operating normally. It also observes which kind of flags the vessel is flying (it is obligatory to fly the flag of registration at all times while at sea.) The Aircraft may not see the details of fishing operations but can identify fishing gears and other devices employed by the vessel and report any non-compliance. A well-maintained Patrol Aircraft is sufficient to provide year-round patrol services.

In order to make patrol operations economical, it could also be used to provide other economically generating activities like VIP tourist services for excursions or sightseeing out at sea (as is the case with Namibia) and even for life-saving missions

7.1.3 Patrol Boats

A patrol aircraft cannot land on the sea to enforce compliance with the legislation of a fishing vessel, it will basically report to an MCS command center, from where a fishing patrol boat is dispatched to the

offending vessel (the plane gives exact coordinates of the violating vessel in question and guides the patrol boat to the direction the offensive vessel is traveling towards. A fishing patrol vessel should be fast-moving and sturdy, to be able to traverse the 200 nautical miles throughout the EEZ to arrest the offending vessels. Apart from observatory facilities, such a vessel should also be manned by armed personnel, preferably from the navy, or police and fisheries officers with adequate scientific and legal training and arrest warrants.

7.1.4 On Board Observers

An on-board observer programme is a requirement that all vessels operating in the country's EEZ have on board the vessel a citizen of that country, to observe all fishing activities including gears used, fishing operations undertaken, species and quantities caught, and any discards made at sea. The person is supposed to be well-trained to recognize these issues at a glance and must not unduly interrupt fishing operations except under exceptional circumstances when verification would be absolutely necessary. The member states should be prepared to spend money to capacity build the observers to mount vessels in their jurisdiction. In many countries such as Namibia, no vessel is allowed at sea without an observer.

One key challenge is to make the observer programme independent and to make it desist from corruption or not to be prone to corruption. In principle, an observer programme should be decoupled from other fisheries management measures and activities. They should therefore report to somebody just beyond the Director of Fisheries management and have their activities decoupled from ordinary fisheries management. Often the observers may be bribed on board by the ship captains not to report non-compliance. Given the remoteness of the operations, it is tempting for observers to assume that they can get away with such behaviour, however, experience has shown that countries that run such a program on a random inspection basis by observers on board achieve near-ideal observer compliance. Currently, the cost of observers on a day-to-day basis is met by the ship-owners but they are also salaried by the government. Observer programme are essential in monitoring adherence to the quota system, and transshipment at sea. The countries in a delineated region should put in place effective national and regional MCS as a pre-requisite for sustainable exploitation of fisheries in their regions and areas depending on the circumstances in which they are in terms of the water bodies.

7.1.5 Research Investment

Research is an essential component of the EEZ fishery, this is because fishing needs to be done in a way that it does not over-exploit the stocks since this would eventually lead to the collapse of the stocks, and also not to pollute the environment.

Under the United Nations Convention on the Law of the Sea UNLCOS section 62, a country is not supposed to grant access to its fisheries to foreign fleets except in circumstances where surplus stocks have been established. Stocks in the African Large Marine Ecosystems as in the case the South West Indian Ocean must be established through scientific investigations. Indicative data from IOTC must show the maximum sustainable yields MSY of the targeted species have been reached or even surpassed. The research will provide scientific information to the managers to help them prepare their management plans also taking into account the maximum economic yield (MEY) of the fishery. In this regard, the Research Institutions carrying out fisheries research should be considered as part of expenditure during

the preparation of the costs of establishing national or regional MCS. However, if fisheries research is sufficiently funded then it is not a must to be funded under MCS allocations.

7.1.6 Fishing Ports and Fish Landing Site Investments

Investment in comprehensive landings facilities would involve the construction of appropriate fishing ports, a stevedoring facility area, cold storage and ice-making facilities and fish landing areas, and a fish market if funds permit. These are capital expenditures that can generate revenue for the government and the private sector if they are operated efficiently. The significance of considering supporting the development of local landing sites or beaches is compliance with international quality trade standards. If a nation-state intends to export its fish say to the EU markets, then it has to meet required HACCP standards and this means that total quality standards have to be met. Quality control starts at the local landing sites moving on.

7.1.7 Fishing Port

The establishment of a fishing port should be a priority and cost-effective item located within a reasonable distance from the next fishing port and in a convenient location to facilitate the crew and the ship to subsequently access the needed supplies, refueling, and other services. The site should be located at the deep section of the harbours so as to dock the fishing vessels.

Establishing a fishing port involves the construction of piers and the installation of hoisting machines and conveyor belts for loading and offloading cargo. The hoisting machine should be sufficient to hoist a whole ship when they seek repairs while docked. There should be dry docking facilities adjacent to the hoisting equipment, with space enough to undertake net repairs and storage of essential supplies. It is anticipated that the vessels would have to pay to dock and be serviced at the port. Such a facility would break even in the costs and revenue of its operations. Regional countries like Mauritius makes more revenue from port services than even from licenses and royalties from their fisheries resources and have come up with even other innovative ways of attracting vessels to their ports such as providing better services.

The anticipated fishing port facility should be of adequate size but may require big investment but this can be achieved through private-public partnerships or joint ventures. It will then be operated in a competitive manner through the private sector. Countries that have signed partnership agreements have used part of the revenue to construct fishing ports as is the case for Seychelles. They have also been able to obtain specific fisheries development aid from the EU, which has been channeled into fisheries infrastructure such as fishing ports, and cold storage facilities

7.1.8 Cold Storage Facilities

A cold storage facility always accompanies a fish port, because fish is extremely perishable, and must be stored at sub-zero temperatures at all times. There would be a need to construct a cold storage facility to hold at least 10,000 M tons of fish with most compartments capable of holding fish at minus 18° Celsius. This is the temperature recommended for storage of frozen fish and they also should have compartments able to keep the fish below 40-60° C., which is the ideal temperature for storing Sashimi fish. This facility can be able to act as a purchase and distribution point for local fish processing firms and also store fish awaiting transshipment. Such cold storage would charge for services rendered, such as storage, and would

be expected to be profitable during operations. The total area required for such a port facility, stevedoring services, and cold storage facilities is expected to be about 150 acres.

7.1.9 Landing Sites

There is always a need to construct landing sites at convenient distances to cater to artisanal fishers. These could be 20 km from each other in order to enable fishers to move easily in between. The total length of the coastline will determine the number and there are standard costs for constructing such.

Private Sector Investments

The aim should be to target public investments to be undertaken by the private sector to invest in setting up fishing and processing establishments to take advantage of the enabling environment created by AU MS countries to promote the fishery sector as per the objectives of the Blue Economy. The private sector will invest in the target fish like tuna and other species in the EEZ. The states will continue with the policy of allowing the artisanal fishers to operate within 12 nautical miles from shore but continue to allow large vessels and foreign registered vessels to operate in the EEZ. AU MS like Kenya which are good situation to take advantage of by-catch landings from the SWIO region and given their excellent linkages to distribute the catch to countries like DR Congo, Rwanda Burundi, and South Sudan. The bycatch can also be processed into fishmeal and given the huge volumes this can be done more efficiently to supply the needs of aquaculture feed supply

Testing Facilities

International fisheries trade is anchored in meeting international standards. These standards are met by implementing strict sanitary procedures (Such as Hazard Analysis Critical Control Points (HACCP), at the landing sites. The Kenya Bureau of Standards KeBS is credited for several parameters by (UKAS) the United Kingdom Accrediting Services, Kenya Plant Health Inspection Services (KePHS) has also been accredited by the SANAS (South African Accreditation Services)

Major fish development of fish processing and handling services would need the presence of an effective Laboratory built strategically say in Mombasa for Kenya and any other suitable places. The laboratories should be cost-effective and accredited for important parameters on fish analysis such as microbiology, heavy metals, pesticides, and other organic compound residues. A laboratory should be built and equipped to test for such compounds so as to allow trade in fish from our areas and get good prices.

8 FINANCING OF MCS OPERATIONS

Financing marine fisheries development also embraces the costs of establishing and operationalization of MCS activities. These include direct government funding through the Exchequer's so-called allocation for the annual estimates of revenue and expenditure for the Treasury. The other source would be Appropriations in Aid from access agreements between AU MS and EU and others for fishing rights and licenses. Part of the agreements could cover the development needs of the fishery in each member state. Some countries have also proposed a Fish Levy Trust to be used in such circumstances.

8.1. Estimated the Cost for putting up the Basic MCS Facilities and Operations - Kenya

The table below summarizes the cost of some basic facilities considered prerequisites for developing the EEZ. The costs are estimated from what similar projects cost in the region cost. In estimating the figures information has been obtained from Seychelles, Namibia, and from equipment manufacturers on the Internet. The cost estimates give the basic costs for establishing the facilities for fisheries development including MCS.

The cost of one kilogram of fish is just about 200 Kshs and above, then the value of 10,000 metric tons would be about 15 billion Kshs annually and it looks possible for a country to spend K Shs 3.5 billion in establishing the basic infrastructure including the one for MCS. This is also enough to address poverty alleviation among the riparian communities in the coastal areas.

There is therefore great need to have a high-level policy dialogue between the Top Government officials, stakeholders and the local communities for the need for the very viable investment in the EEZ and particularly the MCS which would be a big enabler of reaping the benefits from fishing under the Blue Economy project.

Table 1 Estimates of financial costs of the basic Infrastructure including MCS under the EEZ development

S No	Item of Expenditure	Costs in USD
1	Establishment of a VMS system, -an Automatic Locator and Communication (ALC) system – SAT -C Marine secure vessel system for 300 vessels	208,400
2	Purchase of an aerial surveillance aircraft (fixed wing) Sea eagle –(MF MR 2010)	208,333,400
3	Purchase of Surveillance vessel	250,000
4	Purchase of Fisheries Research Vessel	1,833,400
5	Construction of a Fishing Port based on the cost of Pier, docking facilities, and stevedoring facilities	7,500,000
6	Cold Storage and Ice making plants: 10,000MT capacity store and 1,000MT ice capacity	3,20,000
7	Landing site improvement or development	1.280,000
8	An accredited Laboratory	5,200,000
9	Operations and Maintenance Costs	2,800,000
10	Total Costs	

Note: The captured costs are variable costs and will change from one MLE to the next and some AU MS might have had some of these facilities through bilateral agreements with other donors

8.2 Government Funding of Fisheries Activities

Most AU MS governments have development and recurrent allocation towards fisheries development.

8.3 Revenue from Distant Water Fishing Nations

These are revenue from licensing fishing operations. Some countries have others do not

8.4 Financing Fisheries Management Costs through Fisheries Partnership Agreements

Fisheries Agreements what regional AU MS have bargained for the Use of their EEZ marine fisheries resources

It is anticipated that a substantial amount of funds required to establish and operationalize the regional MCS system could come from Access Agreement with the EU and other economic blocks with Distant Water Nations Fishing Vessel operating in the EEZ of AU MS Countries under trade agreements. It is useful to consider what AU MS countries have been able to bargain for with regard to fishing agreements in order to gauge how the establishment of a regional MCS system and operationalization would benefit from such agreements. We shall look at the agreement between SWIO, AU MS, and the Donor countries

Overview of Fisheries Partnership Agreement (FPA) between the African, Caribbean, and Pacific (ACP) countries and the European Union (EU):

- In June 2023, the EU and Madagascar signed a new FPA that will allow EU vessels to fish for tuna in Madagascar's waters for a period of four years. The agreement includes a €700,000 annual payment from the EU to Madagascar, as well as €1.1 million for sectoral support to the sustainable development of the fisheries sector in Madagascar.
- In November 2022, the EU and Gabon signed an implementing protocol to their existing FPA. The protocol extends the agreement for a further six years and includes a number of new provisions, such as a requirement for EU vessels to use more selective fishing gear.
- In July 2021, the EU and Côte d'Ivoire signed an implementing protocol to their existing FPA. The protocol extends the agreement for a further six years and includes a number of new provisions, such as a requirement for EU vessels to pay a fee for each tonne of fish caught.
- These are just a few examples of the latest developments in the FPA between the ACP and EU countries. The agreements are designed to promote sustainable fisheries management and to provide economic benefits to both the EU and the ACP countries.
- Here are some additional details about the FPAs:
 - They are negotiated and concluded by the European Commission on behalf of the EU.
 - They enable EU vessels to fish for surplus stocks in the exclusive economic zone (EEZ) of ACP countries.
 - They also focus on resource conservation and environmental sustainability.
 - As of 2023, there are 16 FPAs in force between the EU and ACP countries.

The FPAs have been praised by some for their focus on sustainability and for the economic benefits they have brought to both the EU and the ACP countries. However, others have criticized the agreements for allowing EU vessels to fish in ACP waters at below-market rates.

Overall, the FPAs are a complex and controversial issue. However, they are an important part of the EU's relationship with the ACP countries, and they are likely to continue to play a role in the future of sustainable fisheries management.

Here are other countries in East and Southern Africa that have proposed a Fisheries Partnership Agreement with the EU:

- Comoros
- Kenya
- Mozambique
- Tanzania
- Uganda

These countries are all located in the Indian Ocean, and they have rich marine resources. The EU is interested in partnering with these countries to promote sustainable fisheries management and to ensure that the benefits of fishing are shared equitably.

In addition to these countries, there are a number of other countries in East and Southern Africa that are considering proposing a Fisheries Partnership Agreement with the EU. These include:

- Malawi
- Namibia
- South Africa
- Zambia

The EU is open to discussing Fisheries Partnership Agreements with any country in East and Southern Africa that is interested in pursuing such an agreement. The agreements are designed to be mutually beneficial, and they can help to promote sustainable fisheries management and economic development in the region.

Here are some of the key benefits of a Fisheries Partnership Agreement between the EU and an East or Southern African country:

- The agreement can help to promote sustainable fisheries management by providing financial support for the development of fisheries management plans and by ensuring that EU vessels only fish for sustainable stocks.
- The agreement can also help to generate economic benefits for the East or Southern African country by providing access to the EU market for fish products and by generating revenue from licensing fees paid by EU vessels.
- The agreement can also help to build capacity in the East or Southern African country's fisheries sector by providing training and technical assistance.

Overall, a Fisheries Partnership Agreement between the EU and an East or Southern African country can be a win-win for both parties. It can help to promote sustainable fisheries management, generate economic benefits, and build capacity in the fisheries sector.

Sustainable Fisheries Partnership Agreements (SFPAs)

The EU has Sustainable Fisheries Partnership Agreements (SFPAs) with non-EU countries, which are negotiated and concluded by the Commission on behalf of the EU. These agreements enhance sustainable fisheries governance and support the development of the fisheries sector with partner countries. SFPAs have gained recognition as a benchmark for good fisheries governance. They allow EU vessels to fish for surplus stocks in the exclusive economic zone (EEZ) of third countries, while ensuring equal rules, scientific management, and social empowerment, with a focus on environmental sustainability, local growth, human rights, and shared accountability.

Currently, the EU has 13 SFPAs protocols in force with third countries: 9 tuna agreements and 4 mixed agreements. The EU also has 7 “dormant” agreements where there is no implementing protocol in force.

Table: List of fisheries agreements

Country	Expiry date	Type	Total EU contribution per year	Sectorial support per year
Cabo Verde	19.5.2024	Tuna	€750 000	€ 350,000
Comoros	Protocol expired on 31.12.2016. Agreement denounced			
Cook Islands	13.12.2024	Tuna	€ 700,000	€ 350,000
Côte d'Ivoire	31.7.2024	Tuna	€ 682,000	€352,000 (2yrs) - €407,000
Equatorial Guinea	Protocol expired on 30.6.2001			
Gabon	28.06.2026	Tuna	€ 2,600,000	€ 1,000,000
Greenland	21.04.2025	Mixed	€ 13,590,754	€ 2,931,000
Guinea-Bissau	14.6.2024	Mixed	€15,600,000	€ 4,000,000
Kiribati	Protocol expired on 15.9.2015			
Liberia	Protocol expired on 8.12.2020			
Madagascar	30.06.2027	Tuna	€ 1,800,000	€ 1,100,000
Mauritania	15.11.2026	Mixed	€57,500,000 (access only)	€3,300,000 (for the entire period)
Mauritius	20.12.2026	Tuna	€ 725,000	€ 275,000
Micronesia	Protocol expired on 24.2.2010			
Morocco	17.7.2023	Mixed	€208 million over a 4 year period	€17.9 - €20.5 million
Mozambique	Protocol expired on 31.1.2015			
São Tomé and Príncipe	18.12.2024	Tuna	€ 840,000	€ 440,000
Senegal	17.11.2024	Tuna + hake	€ 1,700,000	€ 900,000
Seychelles	23.2.2026	Tuna	€ 5,300,000	€ 2,800,000
Solomon Islands	Protocol expired on 8.10.2012			
The Gambia	30.7.2025	Tuna + hake	€ 550,000	€ 275,000

Source: European Commission

SFPAs can provide a number of benefits for both the EU and the third countries involved. For the EU, SFPAs can provide access to fish stocks that are not available in the EU's own waters. They can also help to promote sustainable fisheries management by providing financial support for the development of fisheries management plans. For the third countries involved, SFPAs can generate revenue from licensing fees paid by EU vessels. They can also help to build capacity in the fisheries sector by providing training and technical assistance.

SFPAs have been criticized by some for allowing EU vessels to fish in third countries' waters at below-market rates. They have also been criticized for not doing enough to protect the rights of local fishers.

The future of SFPAs is uncertain. The EU is currently reviewing its fisheries policy, and it is possible that SFPAs will be reformed or replaced. However, SFPAs are still seen as an important tool for promoting sustainable fisheries management, and they are likely to continue to play a role in the future of the EU's fisheries policy.

8.5 *Estimated Costs of Requirements for MCS*

The IUU (Unreported, Unregulated, and Unreported) fishing activities in Africa are of major concern with regard to the 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 wastes, ecosystems, and environmental degradation, pollution among others. Africa's annual share of the global IUU catch has recently been estimated at 4.7 million tons of fish at a conservatively estimated worth value of \$10 billion. Weak governance is a major factor responsible for IUU fishing in coastal states.

Weak MCS systems have contributed to the increased incidences of unsustainable practices and a reduction in aquatic biodiversity in African large marine ecosystems and inland waters. In most cases, the current transboundary MCS systems are weak and require institutional strengthening and capacity development. The issue of sustainability is a key challenge in regional efforts to establish and operationalize regional MCS systems in Africa. Mostly, regional MCS Systems have collapsed or operations not been sustained due to unsustainable financial mechanisms in Africa. At national levels, funding for MCS systems are mainly from public sector annual subvention or budget allocation. Various other approaches have been implemented. Some AU Member States have tried private sector-led MCS systems,

Effective Monitoring, Control, and Surveillance (MCS) of human activities is critical for the conservation and sustainable use of aquatic ecosystems, not least in Africa where highly productive waters foster strong fishing pressure. Several commercially exploited fish species in African Exclusive Economic Zones (EEZs) are either migratory or straddling and most of these species are targeted by illegal fishing vessels. Also, most of the illegal practices that are threats to aquatic biodiversity and environmental management in freshwater and aquatic ecosystems are transboundary in nature. A single-state solution to combating these transboundary illegal practices across Member States' territorial waters cannot be effective.

The classical theory of fisheries economics concerns itself with identifying fish exploitation paths that maximize the present value of net benefits flowing from the fish resources. Fisheries managers have however ignored to address the cost of implementing identified harvesting paths, i.e., the cost of fisheries management. This omission would be disregarded if fisheries management costs were very small. However empirical studies carried out in countries adjacent to the oceans can confirm that these costs are indeed fairly significant and that they may lead to seriously biased fishery policy recommendations particularly if the management costs are continuously downplayed.

Available data on fisheries management costs provides clear proof that costs are indeed quite high particularly relative to the value of landings. The government budget for fisheries is usually in given for, development and recurrent costs in the fishery. However, no critical analysis has been employed to study the cause and effect of each individual expenditure item relative to a given policy objective as regards to apportioning fisheries management costs. As a result, it is in order to examine the theoretical implications of fisheries management costs vis a vis achievements of policy objective. In most instances, it can be concluded that the existence of huge management costs undermines fishery resource management and consequently leads to lower optimal biomass levels and higher optimal fishing efforts.

Empirical evidence confirms that there are wide differences in the efficiency of fisheries management practices across many fishing nations.

8.6 An Examination of Fisheries Management Costs

Management services are not costless. In countries where data is available the cost of these services constitutes a substantial part of the gross revenues from the fishing industry. In the Commonwealth fisheries of Australia for example, the expenditure on fisheries management was estimated to be 28 million Australian dollars in 1991/92 while the total value of landings was about ten times that (273 million). Fisheries management costs in the United Kingdom were reported to be approximately 45 million UK pounds in 1996/97, which corresponded to about 7.5% of the value of all landings of fish. The federal and state governmental expenditure on the fisheries of the United States was estimated at about 1 billion US dollars annually while the average annual value of landings of fish in the United States was 3.5 billion dollars in the period 1991-96.4. Hence, according to these estimates, which are fairly typical for major fishing nations around the world, fisheries management costs may range from 5-30% of the landed value of the catch.

It should be noted that a large part of marine fish landings in East Africa is actually by foreign vessels fishing in distant waters (EEZ). Hence the cost of fisheries management relative to the domestic fishery would be substantially higher if the cost incurred by the DWFNs were imputed to have been incurred from the coastal nations.

The respective governments' expenditures on everything related to fisheries for the years 1990 to 1996 have been looked at and these expenditures are many and varied. For example, they include such expenditures as the running of lighthouses, the provision of weather forecast services, the implementation of safety measures at sea, product quality control, the operation of fisheries/nautical schools, and other educational programmes in addition to what is usually regarded as fisheries management expenditures. Faced with this, the following definition of fisheries management expenditures is adopted for this study.

8.7 Fisheries Management Expenditures

Fisheries management expenditures are defined as all expenditures on activities that are necessary to develop and operate the existing fisheries management system.

This definition clearly excludes all expenditures on fisheries that have no particular connection with the actual management of the fisheries resources. These include on the other hand all research deemed necessary for the management of the fisheries including stock assessment and forecasting, economic estimation, modeling, etc. It also includes the cost of designing, implementing, and modifying the fisheries management system and, perhaps most importantly, the cost of enforcing the fisheries management rules.

In totally unmanaged fisheries, the cost of fisheries management according to the above definition would be zero but the government may still spend a good deal of money on fisheries services such as harbour facilities, lighthouses, education, etc.

From the above definition, the main categories of fisheries management costs are:

- Research
- The design and implementation of fisheries management rules.
- Enforcement

Research generates the information required in (a) the design and implementation of the appropriate fisheries management system and (b) fisheries management decisions under a given fisheries management system such as the setting up of an appropriate MCS system, imposing appropriate mesh restrictions, the number of fishing licenses to allocate, etc. This requires both biological and economic research.

The design and implementation of fisheries management rules are usually conducted (or led) by the Ministry in Charge of Fisheries or a corresponding government agency. This is essentially a political and administrative function that uses research as an input and is generally not very expensive as such, at least not compared to the research itself.

Enforcement is generally the most expensive part of fisheries management. It includes monitoring surveillance and enforcement activities both at sea and on land. The enforcement activity at-sea requires the use of patrol vessels and airplanes and sometimes even onboard observers all of which are quite costly. On-land enforcement activities involve the assessment of the volume of catch most often at the point of landing, an inspection of vessels, gear, and catches, double checking at processing, retail, and export points, etc. In addition to at-sea and on-land monitoring, the administrative and judicial procedures necessary for the processing of violations are generally quite meticulous and costly. In assessing fisheries management costs in AU member states, every attempt should be made to adhere to common definitions of cost categories in order to make the resulting figures comparable. Different reporting and accounting practices in the countries make it impossible, however, to accomplish this fully.

The absolute level of fisheries management costs is usually not as informative as they expected to be. However, one of the purposes of fisheries management is to increase fisheries rents. This aim is a pertinent comparative measure whereby fisheries management costs are measured relative to fisheries rents generated. In most cases, there are no reliable estimates of fisheries rents generated in the national fisheries or more so for regional fisheries. What is usually available, however, is the fisheries management costs as a fraction of or compared to the landed value of the catch.

Measured as a fraction of the landed value of catches, fisheries management costs are by far the highest in the countries that have managed to undertake such studies recently. In Newfoundland, for example fisheries management costs have ranged between 15 and 28% of the landed value of the catch and exhibit a slight downward trend over the period going forward. In Norway, management costs as a fraction of the landed value of catch have declined from almost 13% to the current level of 8%. In Iceland, the corresponding fraction has been about or just under 3% with a slightly increasing trend.

These high fisheries management expenditures raise the pertinent question of whether these costs are justified. Alternatively, if one of the aims of fisheries management is to increase the net economic benefits from the fisheries, then it would be important to know if the incurred fisheries management costs really generate fisheries rents in excess of the expenditures. In the case of Iceland which operates an efficient fisheries management system, the answer is affirmative. For Norway and in particular Newfoundland this is much more doubtful. In fact, for Newfoundland, it may be questioned whether the maximum attainable fisheries rents can actually exceed 25-30% of the landed value of the catch which is the cost of fisheries that management has sometimes reached. Do the AU MS generate fisheries rents in excess of the fisheries management expenditures since this is what will determine cost effectiveness and sustainability over time.

In spite of widely differing total expenditures by the member states, the relative size of the main components of fisheries management activities are remarkably similar or it may be concluded so. The single most expensive fisheries management activity is the monitoring and enforcement at sea in most countries. In Iceland and Norway, this is done by the coast guard while in Newfoundland the Department of Fisheries has its own enforcement and monitoring service. Norway spends the equivalent of USD 50 million annually on Coast Guard activities which is more than twice the amount spent in Newfoundland with Iceland spending only about 1/5 of the Norwegian cost. The high ocean enforcement expenditures in Norway may to some extent be explained by its much larger exclusive economic zone than that of Iceland or the Canadian zone around Newfoundland.

The second largest cost item in all three countries mentioned above is marine research. In Norway, the expenditure on marine research is just slightly above one-half of the expenditure on enforcement at sea. In Iceland, marine research is almost as costly as the coast guard expenditures. In Newfoundland, the marine research expenditures have also been almost as high as the coast guard expenditures but have declined in recent years.

The third most important cost category is the enforcement of fisheries management rules by the Directorates of Fisheries in the AU MS and the regional fisheries bodies. This activity covers both enforcement on land and at sea excluding coast guard activities. Altogether, this cost is by far the higher than research in, where for instance in Norway the costs are about 1/5 of the total of management costs.

8.8 *The fisheries policy function*

The policy function, i.e., formulation and implementation of fisheries management, in one word the administration of the fisheries management system appears to be the least expensive in the three countries although it should be remembered that the data for Newfoundland is not as perfect in this respect.

Taking into account the similar cost by the Ministries of Fisheries, the costs in Norway and Iceland appear to be similar or about 3 million USD per year in each country. This corresponds to 3 and 7% of total fisheries management expenditures in each country respectively.

The breakdown of the fisheries management expenditures in the three countries according to the main cost categories as discussed for the countries above are;

- Research,
- Policy and administration and
- Enforcement of fisheries management rules.

As indicated above, in spite of widely different fisheries management expenditures, the expenditures on these categories as a percentage of overall fisheries management expenditures are remarkably constant across the three countries. Therefore, it may not be unreasonable to expect that in fisheries management systems of a similar nature, enforcement costs would account for about 3/5 of total expenditures, research for about 1/3, and general administration for the rest.

9. ESTIMATING THE FISHERIES MANAGEMENT COST FUNCTIONS.

It has been established that fisheries management costs are quite significant as a fraction of the gross landed value of the catch. This suggests that in designing rent-maximizing fisheries policies it is expedient also to consider of the costs required to implement such policies.

Traditional fisheries models from Gordon (1954) through Smith (1968), Clark and Munro (1982), up to the present derive optimal fisheries policies based on the implicit assumption that management costs are zero. Since it has now been established that management costs, do, constitute a substantial fraction of the landed value of the catches, it can be concluded that the models used in the past have not been adequate as a basis for fisheries policy. This has been a serious omission in that many applied fisheries models specifically designed to provide management advice have adopted such assumption, that management costs are immaterial which is erroneous. This applies to most biological models, many of which ignore economic considerations, altogether, (see e.g., any ICES working group TAC recommendation) as well as most empirical economic models (Helgason and Olafsson 1988, Arnason 1990, Placenti et al. 1992 and Baldursson et al. 1996).

The above observation suggests that there is a definite need to modify fisheries models to include fisheries management costs to make them complete. Fisheries theoretical production models are the natural starting points for fish species and stock investigations. These should serve as the blueprint for most empirical models which can then be modified accordingly to include fisheries management costs such as MCS. In so doing the costs can be predetermined and then passed to the fishers, government or consumers as the case may be. There would be little difficulty in meeting the cost of operationalizing MCS or any other fisheries management cost. At this stage, it is in order to include fisheries management costs in empirical fisheries models as a requirement in the estimation of an additional functional relationship, the fisheries management cost function.

10. A FRAMEWORK FOR DEVELOPING A COST EFFECTIVE AND INNOVATIVE FINANCING MECHANISM FOR REGIONAL MCS

10.1 Introduction

MCS systems exist in several countries and in all the five regions of Africa. Some countries have just one component, while others have a combination of the three components. Although some African countries have acquired the capacity for modern technologies, particularly VMS, many still rely on conventional methods of monitoring and observing fishing activities, especially for countries with principally artisanal fisheries. However, several countries, especially those with sizeable industrial fisheries do have MCS with modern technologies such as VMS and AIS. There are also MCS systems with VMS, sonar, and AIS at regional levels usually under the aegis of an organization or a project.

Many States have enacted fisheries legislation with MCS-related provisions, mainly as a police function to punish lawbreakers; however, not all of them fully implement international and regional obligations and commitments. A number of countries have a comprehensive legal framework for fisheries, which includes measures to address fisheries crime and is supported by a full MCS operational unit. Several countries have relatively updated legislation on fisheries but only with some specific regulations on MCS; while many have a more basic MCS framework in place and very few regulations and evidence of implementation. A number of countries have included in their legislation a participatory approach to management which may be developed to encourage voluntary or self-compliance amongst fishers in the absence of other MCS tools

10.2 How the On-going Regional MCS systems are financed

Several African States, cooperate with each other, bilaterally and multilaterally, in implementing MCS measures through regional programs. A number of organizations, such as the Sub-regional Fisheries Commission (SRFC), the Indian Ocean Commission (IOC), and the Southern African Development Community (SADC), have put in place regional MCS programs.

The Sub-regional Fisheries Commission of Northwest Africa (SRFC) was established by Convention in 1985 and is made up of seven Northwest African States (Cape Verde, Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal, and Sierra Leone). The Commission has undertaken activities in MCS. In addition to licenses, vessels are subject to gear restrictions and inshore exclusion zones, and zoning by type and species fished. Port pre-license inspections are carried out in some States, and FAO vessel marking by call sign is either legislated or recommended throughout the region. Transshipping is widely monitored, although the lack of sea-borne surveillance reduces its effectiveness.

The major focus initially on MCS, was the provision and funding of fisheries aerial surveillance. In 1994, the Commission set up the Surveillance Operation Coordinating Unit (SOCU); based in Banjul, The Gambia, and financed by the Government of Luxemburg, to provide support to the secretariat of SRFC by collecting information on fishing operations along the coast of its seven-member countries, train air observers, and reinforce cooperation between the countries of the sub-region. Sub-regional flying commenced in July

1996. The original three aircraft were stationed in Cape Verde, Senegal, and Mauritania. SOCU worked intimately with the coast guards of the countries, and such joint operations contributed to the arrest and prosecutions of vessels fishing illegally. Between 2002 and 2006, 1102 vessels were detected, 378 were inspected and 55 vessels were arrested. The value of aerial surveillance as a control mechanism against illegal fishing in the sub-region has been demonstrated and accepted.

A pilot VMS scheme commenced operation in Senegal in 2000. There are many patrol boats within the sub-region, in various states of operational readiness. Many are unsuitable, either because of general conditions or cost-effectiveness. The sub-region faces a serious and ongoing situation involving a hard core of illegal trawlers fishing without licenses, or in some cases semi-legitimately with licenses. These vessels are often protected in their operations by vested interests, and fish with no regard whatsoever to fisheries regulations or good practices.

10.2.1 Southern African Development Community (SADC),

Southern African Development Community is a Protocol on Fisheries was signed in 2001 and entered into force on 8 August 2003, aims to achieve regional integration and eradicate poverty within the Southern African region. In July 2008, SADC ministers responsible for marine fisheries, signed in Windhoek, Namibia SADC Protocol on Fisheries, which is a statement of commitment on IUU fishing. In this protocol, the ministers declare they would strengthen fisheries governance and legal frameworks to eliminate illegal fishing and strengthen MCS capacity – and resolve to commit to effective implementation of existing MCS measures.

The objectives of the Protocol on Fisheries are to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems of interest to State Parties in order to:

- promote and enhance food security and human health;
- safeguard the livelihood of fishing communities;
- generate economic opportunities for nationals in the region;
- ensure that future generations benefit from these renewable resources; and
- alleviate poverty with the ultimate objective of its eradication.

By signing the SADC Protocol, the Member States agreed to harmonize their domestic legislation with particular reference to fisheries and the management of shared resources, to take adequate measures to optimize fisheries law enforcement resources in order to protect aquaculture and the aquatic environment and safeguard the livelihood of fishing communities. SADC has undertaken activities related to the establishment of effective cooperation on MCS among the SADC coastal Member States. A Regional Fisheries Monitoring project funded by the African Development Bank is ongoing. The SADC Regional Fisheries Monitoring project seeks to develop a regional MCS strategy and regional plan of action in relation to IUU fishing. Regional MCS activities are to be coordinated at the SADC MCS Centre has been established in Maputo, Mozambique. Among the regional activities are enhanced information sharing, the development of a regional fishing vessel register, and a regional VMS framework. It is also envisaged that the national capacity for MCS activities among member states will be improved.

Under the regional initiative the intention is to improve regional and inter-regional cooperation with a view

to eradicating IUU fishing; strengthen fisheries governance and legal frameworks to eliminate illegal fishing; develop a regional MCS strategy and a regional plan of action in relation to IUU fishing; and strengthen fisheries MCS capacity.

On 4 July 2008, the ‘SADC Statement of Commitment on IUU Fishing’ was signed by the Ministers at the Ministerial Conference and it was later endorsed by the SADC Summit. This commitment was followed by various implementing actions:

- Strengthened and successful implementation of SADC coastal State laws relating to IUU fishing;
- Strengthened policy and legal frameworks to address the issue of IUU fishing;
- Stop illegal Fishing – established to support this process was deemed a success, and
- SADC IUU fishing Task Force was appointed in 2011.

10.2.2 The Stop Illegal Fishing campaign programme

The “Stop Illegal Fishing campaign” is the first ever multilateral patrol involving four neighbouring countries of South Africa, Mozambique, Tanzania, and Kenya. Monitoring the landings of IUU vessels has dramatically improved in South Africa and in other ports in countries that are signatories to the SADC Fisheries Protocol. SADC countries have signed a protocol on data exchange which has not been implemented due to technical difficulties and the low number of countries with fully functioning VMS systems.

10.2.3 The Indian Ocean Commission

The Indian Ocean Commission (IOC) is working towards sustainability through their programme for the Coastal, Marine, and Island Specific Biodiversity Management in Eastern and Southern Africa and the Indian Ocean region (ESA-□ region). This project aims to maintain the region’s biodiversity through improvements in policy, education, and data networking systems, and the implementation of Biodiversity Thematic Centers.

To reduce IUU fishing in the region, the IOC works through the Regional Fisheries Surveillance Plan (RFSP) and the SmartFish program. Additionally, RFSP promotes regional sustainable fisheries management and development. SmartFish aims to improve fisheries governance and management using the Action Plan that has been prepared for fisheries management and development for the ESA-IO region. SmartFish among other things seeks to develop effective monitoring, control, and surveillance capabilities. The program investigates and assesses the capacity of individual countries to implement MCS and is establishing individual needs and expectations. The program also promotes compliance with regional and international instruments and agreements. SmartFish seeks to sustain MCS activities and ensure reliable institutionalization. Among SmartFish’s MCS activities are Data-sharing, Flag State, and Port State measures.

The IOC Regional Fisheries Surveillance Plan (RFSP) seeks to pool and share the existing capacities of coastal states in the region to consolidate and perpetuate the regional MCS strategy by monitoring regional fisheries through targeted and deterrent controls based on risk analysis. In support of this goal, the RFSP coordinates regional and national patrols, plans joint aerial and maritime patrols, and sets monitoring priorities and annual action plans.

As of February 2014, the program has held 39 joint patrols, deployed 350 inspectors at sea, logged 1,100 maritime patrol days and 850 aerial patrol hours, conducted more than 420 inspections at sea of fishing vessels - a number of which are vessels that do not go to the port, and cited 10 fishing vessel arrests and 40 infringements.

Under the SmartFish Program, the IOC Member States have been provided with support in addressing issues associated with IUU fishing through regional MCS cooperation. The Member States are therefore able to achieve the following;

- Exchanging VMS and satellite positioning data;
- Collection of data by IOC;
- Collection of observer data;
- Data from neighbouring States (South Africa, Mozambique, Kenya, Tanzania, Somalia);
- Data of vessels licensed; and
- Specific support to national control and monitoring of the fisheries center of the Union of Comoros.

10.3 Major Challenges Facing the Establishment of MCS in Africa

Vessel Registers: Most countries with active fisheries have vessel registers, but these are not regularly updated and the information is shared between states of the African Union. A possible reason is that the countries may not have many industrial or semi-industrial fishing vessels under their own flag. In these countries, the focus is on artisanal fisheries which present a very different problem. In countries with significant industrial commercial fisheries sectors, there are formal databases – these are normally comprehensive integrated systems that incorporate many different fields. There are no credible regional fisheries vessel registers.

Partnerships and participatory MCS: National Observer programs are in place in some countries, but in general, they are not very effective., RFMOs such as IOTC and ICCAT have effective management frameworks in place to implement and coordinate a regional observer program. The program is however still dependent on contracting Members to train and deploy observers and this is a setback for AU-MS members of these bodies that do not have the capacity to monitor fishing activities in their EEZ. Attempts have been made, over the past three decades, to train national observers to regional standards; these are somewhat ineffective in the face of management and coordination problems at a national level. There are no specific rules regarding national observer coverage levels. However, all the RFMOs have Conservation or Management Measures (CMMs) in place requiring vessels to accommodate scientific fisheries observers, with stipulated observer coverage requirements. Few AU-MS meet their commitments.

Insufficient human resources: Effective MCS systems depend on acquiring quality personnel and training them to the levels required to perform their duties efficiently. However, the lack of the appropriate capacity and a sufficient number is a major stumbling block in most AU-MS. Needless to say, credible staff with a high degree of integrity and professionalism is important to ensure the success of any MCS system

Training programs on wide-ranging topics on MCS have been conducted in all the regions over the past three decades by international organizations including FAO, Indian Ocean Commission, regional fishery

bodies such as the Sub Regional Fisheries Commission (SRFC), RFMOs, and regional Projects. While such programs seemed to have been useful they are not sustainable because for a variety of reasons countries have not capitalized on them. Several Training Manuals are available on the continent.

Lack of effective legal framework: The lack of an effective legal framework is recognized as an impediment to an effective and fully functional MCS. A number of institutional and practical challenges are confronted by African States in establishing a robust legal framework, such as the long process of updating laws and developing comprehensive regulations, the need for a thorough understanding of the legal aspects of MCS tools, lack of use of MCS information in judicial proceedings, lack of strong collaboration between institutions with fisheries-related functions, and inadequate financial and human capacity.

Issues related to Enforcement: Many countries have weak enforcement apparatus in place, in that MCS tends to be limited to surveillance whereas fisheries enforcement aims to ensure the correct application of regulations regarding fisheries and to impose compliance with these rules where necessary. Enforcement activities are designed to respond to non-compliance and include: Formal inspections to verify compliance using overt and covert means. Investigation of suspected breaches of the laws; measures to compel compliance without resorting to formal court action; for example, warning letters, directions; notices, penalty notices, Ministerial orders – or a combination of these. The use of maximum sanctions as effective deterrents such as seizure of fish, fishing gear, boats, trailers, and vehicles and withdrawal of access to a fishery through suspension or cancellation of licenses, are not frequently applied. The PFRS underscored that National and regional policies and strategies should provide the basis for regional cooperation and information sharing to support joint actions against illegal operators in the fisheries sector. The 2050 AIM Strategy, recommends that in order to further deter IUU fishing activities, sanctions “of sufficient gravity as to deprive the offenders of the benefits accruing from their illegal activities” shall be put in place as per the 2005 Rome Declaration on IUU Fishing,

Prosecutors play a key role in ensuring that any criminal proceedings pertaining to alleged cases of illegal actions are successful. However, before credible prosecutions can be undertaken, a system for monitoring, control, and surveillance of the fisheries must be in place. At-Sea Boarding and Inspection are central to MCS in marine fisheries. It is probably the most critical tool for verifying compliance with the fisheries laws and regulations enacted by the coastal State or group of coastal States. Furthermore, for noncompliance to be sanctioned, the offense must be in the national legislation, reinforcing the importance for States to work towards ratification, accession, and/or acceptance, domestication, and implementation of the relevant fisheries-related instruments.

10.4 Recommendations by the 2050 AIM Strategy to combat IUU Fishing

AU Member States are urged to endeavor to deter IUU fishing activities. Recommended measures include:

- Effective licensing and control of vessels allowed to fish by flag States;
- Real-time positional reporting by licensed vessels via Vessel Monitoring Systems (VMS);
- Surveillance and interception of irresponsible fishing by on-water patrols;
- Implementation of technical regulations for the safety of non-convention fishing vessels; and

- Promotion of effective flag State implementation in a broader context through the enforcement of RFMO measures, such as ‘white’ or ‘black lists’ to identify ‘bad actors.’”

Key experiences and lessons learned from the past and ongoing regional programs include:

- cooperation of countries in eradicating IUU sends a clear message of unity of purpose;
- development of a professional MCS staff is the most important, but often least talked about component of a comprehensive MCS plan
- adequate consultative planning between participation states is critical;
- need to harmonize MCS systems among the States in the same sub-region;
- data, facts, and evidence for prosecutions could be provided during MCS patrols;
- few trained observers; and this is always a challenge;
- adequate training for observers is key to quality data collection and management;
- national/domestic laws should at least have provisions for the implementation of regional and international agreements, and
- ratification and implementation of PSMA is a prerequisite to effectively combat IUU fishing.

10.5 Priorities areas in Strengthening regional cooperation

Based on the assessment of the IUU fishing phenomenon in the continent and the status of MCS systems in the regions including an assessment of the strengths and weaknesses of these systems; it is evident that investing in seven priority areas will significantly strengthen regional cooperation in MCS for effective and strategic combat of IUU fishing in Africa. The priority areas are:

1. Regional training programs on Needs Assessment on the implementation of Port State Measures Agreement to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing (PSMA).
2. Comprehensive review of national legislation and regulations in the regions.
3. Improvement in data collection and sharing.
4. Strengthen ongoing Regional Observer Programs and develop others, as appropriate.
5. Promote the involvement of regional and multilateral organizations in the activities.
6. Strengthen ongoing MCS regional programs and develop others, as appropriate.
7. Regional capacity building in a number of key aspects of MCS.

10.5.1 Capacity Needs Assessments for the Implementation of Port State Measures Agreement

The highest priority action to strengthen regional cooperation in MCS to combat IUU fishing, is the organization of a series of regional Training Workshops on Capacity Needs Assessments (CNA) on implementing the PSMA.

The organization of such training workshops is justified because, as of 18 May 2018, 20 AU MS are Parties to the Agreement, with three others who are Signatories. All the AU MS, except one, are members of RFMOs. It is important to capitalize on the momentum that has been built up, over the past year and ensure effective implementation of the Agreement.

Implementation of the Port State Measures Agreement to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated Fishing (PSMA) is the best option to combat IUU fishing. This is because port State

measures are a part of a larger, integrated monitoring, control, and surveillance (MCS) system, particularly useful for the regulation of foreign-flagged vessels that have fished or may have fished outside the waters of the port State. The measures apply to fishing vessels and, significantly, to vessels engaged in fishing-related activities (such as Transshipping and resupplying) that may have supported IUU fishing vessels.

Port-based compliance and enforcement measures, tend to be relatively cost-effective when compared with many other elements of an MCS system. The main cost is related to establishing and maintaining an adequate, well-trained fisheries inspectorate with good levels of communication between national agencies, including customs and port authorities, and cooperation with regional bodies, such as regional fishery bodies. The optimum use of information gathered during inspection and from other components of the national, regional, and international MCS system is also an important characteristic of the PSMA. This implies that to fully implement the PSMA, good communication is needed among national agencies involved in fisheries management, such as customs and the port authority, as well as cooperation with appropriate regional and global bodies.

In addition, effective implementation of the PSMA requires each AU MS to have:

- The legal authority to enable effective enforcement action in accordance with provisions of the PSMA and other international legal instruments relating to fisheries.
- A sufficiently staffed, adequately trained, and well-informed inspectorate, operationally well-integrated with the larger MCS system.
- Systematic cooperation and sharing of information and intelligence between national agencies associated with different aspects of MCS and among port, flag, and coastal States, RFMOs, and other organizations.

To be able to implement the Agreement successfully, it is indispensable to conduct a capacity needs assessment (CNA). FAO has developed a Guide for that purpose and recently, the PEW Charitable Trust, in cooperation with the New Partnership for Africa's Development (NEPAD), through its Stop Illegal Fishing Working Group, and six African countries (Cote d'Ivoire, Kenya, Mozambique, Senegal, Seychelles and the United Republic of Tanzania), has supported the development of a capacity needs assessment (CNA) methodology, which is part of a set of tools, to ensure that States have the necessary tools at hand to effectively implement the PSMA, and can move quickly towards closing all ports to the world's fleets engaged in IUU fishing.

In addition, AU-MS that are yet not so, are encouraged to work toward ratification, accession, and/or acceptance, domestication, and full implementation, of the other international instruments. For States that are willing but do not have the capacity to undertake the domestication process, some of the international instruments have provisions for assistance to developing countries.

10.5.2 Undertake Reviews of national legislation and regulations

An MCS system needs to be based on clear legal rules that set out the rights and responsibilities of the various parties, in order to be effective. These rules should provide effective and efficient legal procedures and mechanisms for implementing those rules consistently. It is therefore important to review the existing national legislation and regulations of countries in a region to ensure they are up to date in their laws and

policies; that the legislations and regulations contain relevant provisions on MCS, in particular, that they prescribe norms that are appropriate to achieve the desired fisheries management objectives and contain provisions that facilitate effective enforcement; and that there are no conflicts between the laws and regulations of Member countries which might make regional cooperation difficult.

The review will include an analysis of gaps/ weaknesses, and challenges in their implementation/ enforcement; identification and analysis of areas requiring harmonization (convergence) for sustainable transboundary fisheries resources management, and combat IUU activities; with recommendations for effective implementation of the proposed harmonized legislation and regulations.

10.5.3 Improvement in data collection and sharing

The collection, management, and availability of accurate and timely information is critical for managing fishery resources and combating IUU fishing. Accurate data on the number of fishing vessels, the history and characteristics of the vessels, and fishing activity is required to track vessels that are registered, flagged, licensed, or even active in the region in order to help deter IUU fishing activity. It is therefore important to maintain comprehensive and up-to-date vessel registers and catch and effort information as well as socioeconomic information in a uniform and harmonized manner, by all States, both coastal and flag. In this regard, countries in the same region should:

- Work together to improve their data collection systems and to share information about vessels, fishing effort, catch levels, fish landings, and sales of fish and fish products, as appropriate, and; work to develop a regional approach to identify, compile and exchange information on any vessel used or intended for use for the purpose of fishing including support ships, carrier vessels and any other vessels directly involved in such fishing operations in the region. and across national jurisdictions
- Work to eventually have a Regional Fishing Vessel Register

Critical to any form of regional data collection, undertaken by individuals from different member States and deployed in different national waters, is that the data collected is uniform throughout the region.

10.5.4 Development and strengthening of ongoing Regional Observer Programs (ROP)

Regional Observer programs constitute a viable option to combat IUU fishing. Observer programs provide the regulatory framework for fisheries management, as well as, ensure compliance with fisheries regulations. Those who collect scientific information are called Observers; those who are concerned with regulations are called Compliance Officers or Inspectors.

Regional fisheries observer programs benefit the regional and national organizations involved as well as the observers, vessel owners and the Fisheries Management Authorities (FMAs), in terms of shared training and management costs, dual use of observers and easier movement of vessels between nationally and regionally managed waters. There is a need to develop/ strengthen, as appropriate, these programs including the requirements for industry to adhere to inspection regimes and carry observers on board when required.

However, regional observer programs will only be effective if all observers meet the same level of competency standards (minimum requirement and training), share the same data collection objectives (compliance and scientific), and benefit from similar management action (briefing, work and sampling protocols, debriefing, and reporting).

There are several Training Manuals on the continent. AU-IBAR has produced the draft of the Framework for establishing a sea-based regional fisheries observer program. The Document, among other things, outlines the objectives, legal framework, financial requirements, institutional arrangement, management, monitoring and sampling strategies, etc. The AU-IBAR Observer Training Manual focuses on sea-based scientific observers (although similar practices could be applied to shore-based observers) and provides a regional standard for the training of observers.

10.5.6 Involvement of regional and multilateral organizations in the activities

Combating IUU fishing is a continental issue. The management and technical capacities built up over the years by regional organizations, particularly RFMOs, should be harnessed to assist with the phenomenon of IUU fishing. AU-MS, members of RFMOs, should work closely and collaboratively to meet their obligations. AU MS should encourage RECs and other relevant regional organizations to provide assistance in technical support and development of guidelines, manuals, capacity building, sharing data and information on fisheries and trade, etc.

10.5.7 Strengthening of ongoing MCS Initiatives and establishment of others

It is important to strengthen the ongoing MCS initiatives in East and Southern Africa under the aegis of IOC and SADC and revamp the Sub-regional initiative in Northwest Africa under the Sub-Regional Fisheries Commission.

The five AU MS of North Africa indicates that there is a need to support and strengthen the General Fisheries Commission for the Mediterranean's (GFCM) center and centralized VMS system and other MCS tools. In this regard, the countries suggested the conduct of an identification/feasibility study to assess the costs of introduction of transponders (VMS or other MCS tools) to enable the states concerned to interact with the centralized system for MCS and alert on IUU fishing, as well as search and rescue at sea.

For the other regions which do not yet have regional MCS systems, it is important to note that some of the countries already have patrol boats as well as VMS. Working through their respective regional fishery bodies, it has to be determined that there is the political will and commitment for a comprehensive regional MCS. Feasibility studies should be undertaken to determine its viability, followed by the elaboration of a Plan of Action to accomplish the task. In the meantime, the states should strengthen cooperation by engaging in MCS activities with other states; sharing information, conducting regional training on both the legal and practical aspects of Vessel Monitoring Systems and Observer Programs to facilitate cooperation among legal and technical personnel, and adopting lessons learned from successful regional MCS fisheries programs such as IOC's SmartFish. The regional fishery bodies should establish formal arrangements and protocols between them and RFMOs in the same region that will facilitate the exchange of information on IUU fishing and data obtained from MCS tools and exchange experiences with these RFMOs. Joint initiatives

should be developed between the regional fishery bodies and arrangements and RECs by exchanging information that will achieve common fisheries objectives and adopt policy measures within the purview of RECs to encourage cooperation against fisheries crimes.

10.5.8 Regional capacity building

Capacity building and training is an essential component of any MCS system and should be viewed as a continuous process. The level of expertise that is required by MCS staff ranges from basic literacy, interpersonal skills, and general knowledge of the fishery, scientific research, to higher level expertise such as those required for management, data analysis, and addressing policy and legal aspects. These latter components usually require higher-level skills that are obtained through tertiary education. Training programmes have to take into consideration staff turnover rates, personnel development, and additional training that may be required for new equipment or procedures that are incorporated into the MCS system.

AU MS need sufficient human resources and expertise to fulfill the roles assigned to them under each of the MCS components. To build these capacities, AU MS should

- Continue developing the appropriate core competencies in MCS systems including managerial aspects of MCS, the right mix of technological and community approaches to MCS, inspections at sea and in port, the use of force, enforcement, the basic obligations of the coastal, flag and port States, as well as prosecution and judicial processes, taking into account the different legal systems (common law and civil law).
- Ensure that flag States from outside the region that operates in the region be urged to cooperate with and assist technically and financially, those AU MS in the region in whose waters they conduct fishing operations.

Candidates for such training should include not just technical and administrative staff but also those from the judicial and legal department, Trade, the Navy or Coast Guards, etc. as appropriate to the region.



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