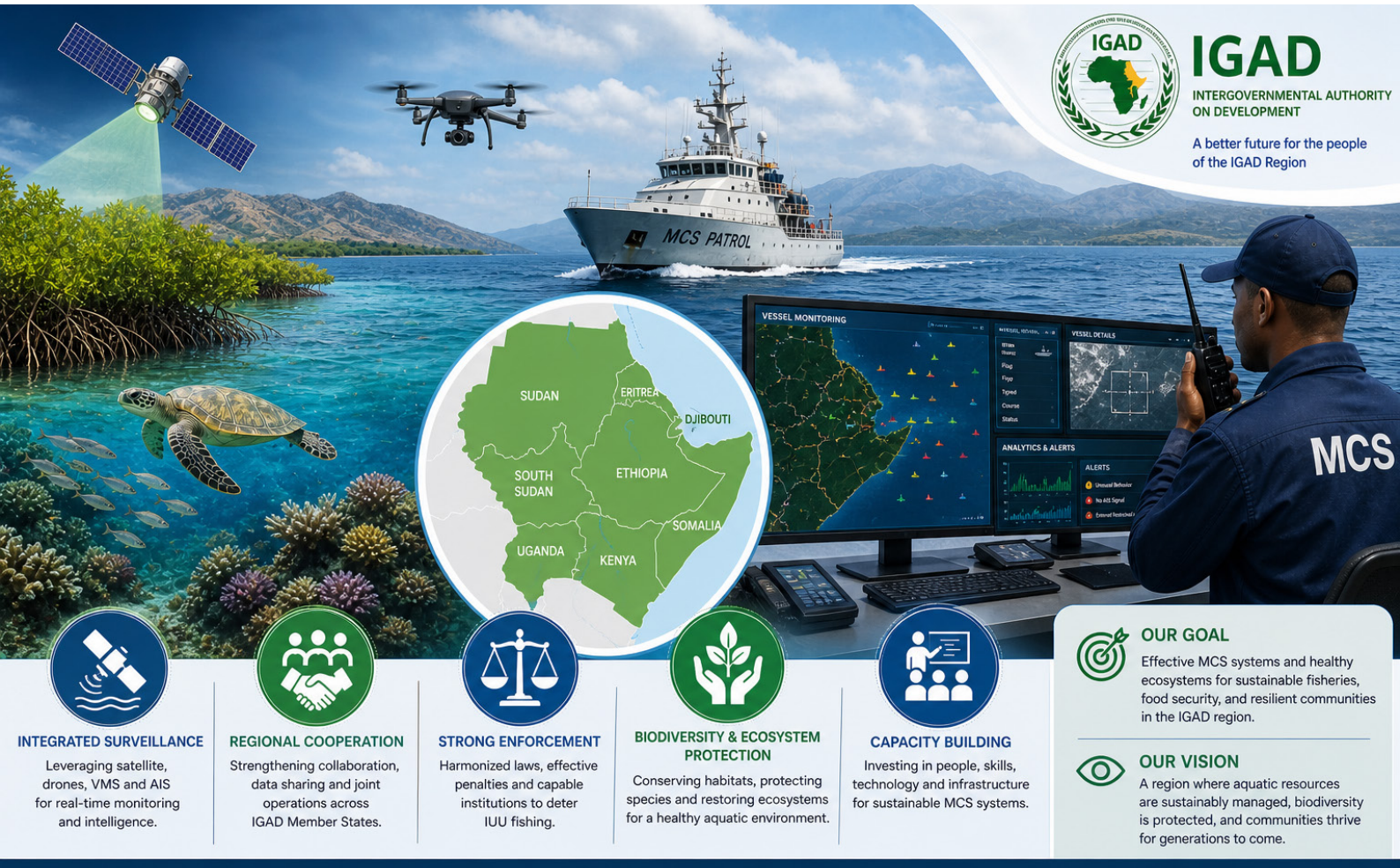
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POLICY ORIENTATION PAPER

Regional MCS Systems for Protection of Aquatic Biodiversity and Environment towards healthy ecosystems and fish stocks in the IGAD Region:

A Call for Enhanced Capacity Building and Cooperation



INTEGRATED SURVEILLANCE
Leveraging satellite, drones, VMS and AIS for real-time monitoring and intelligence.

REGIONAL COOPERATION
Strengthening collaboration, data sharing and joint operations across IGAD Member States.

STRONG ENFORCEMENT
Harmonized laws, effective penalties and capable institutions to deter IUU fishing.

BIODIVERSITY & ECOSYSTEM PROTECTION
Conserving habitats, protecting species and restoring ecosystems for a healthy aquatic environment.

CAPACITY BUILDING
Investing in people, skills, technology and infrastructure for sustainable MCS systems.

OUR GOAL
Effective MCS systems and healthy ecosystems for sustainable fisheries, food security, and resilient communities in the IGAD region.

OUR VISION
A region where aquatic resources are sustainably managed, biodiversity is protected, and communities thrive for generations to come.

OUR COMMITMENT | Sustainability | Transparency | Accountability | Inclusiveness | Innovation | Partnership

Working together for a resilient blue economy in the IGAD region.

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Disclaimer: The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the African Union InterAfrican Bureau for Animal Resources and Intergovernmental Authority on Development (IGAD).

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Note: This Advocacy paper is a synthesis of the outcomes of the Regional Workshop on Strengthening Capacity for Regional MCS Systems for Protection of Aquatic Biodiversity and Environment in the IGAD Region. The work was conducted under the project 'Conserving Aquatic Biodiversity in African Blue Economy 2021-2027', funded by the Swedish International Development Cooperation Agency (Sida) to whom we are grateful for the financial support.

Executive Summary

Aquatic ecosystems across the IGAD region, encompassing the Red Sea, Gulf of Aden, Western Indian Ocean, major inland lakes such as Victoria and Turkana, and extensive transboundary river basins including the Nile, represent a critical foundation for food security, livelihoods, employment, and economic growth. These ecosystems support millions of people directly and indirectly through fisheries, aquaculture, tourism, and ecosystem services, while also contributing significantly to national economies and regional stability. However, their sustainability is increasingly under threat from a combination of anthropogenic and environmental pressures, most notably Illegal, Unreported and Unregulated (IUU) fishing, habitat degradation, pollution, invasive species, and the accelerating impacts of climate change.

At the center of these challenges lies the limited effectiveness of Monitoring, Control and Surveillance (MCS) systems across IGAD Member States. Existing MCS frameworks are often fragmented, under-resourced, and insufficiently coordinated both within and between countries, with limited adoption of modern technologies and weak integration of biodiversity conservation objectives. These systemic weaknesses have enabled the proliferation of IUU fishing, resulting in significant ecological degradation, loss of biodiversity, and substantial economic losses. The persistence of such challenges underscores the urgent need to reposition MCS from a narrow fisheries compliance mechanism into a comprehensive, ecosystem-based governance tool.

This Policy Orientation Paper proposes a strategic and coordinated regional response through the development of **integrated, technology-enabled, and ecosystem-based MCS systems** that align with continental priorities under the Africa Blue Economy Strategy (ABES), the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS), IGAD Regional Blue Economy Strategy, and AU Agenda 2063. It emphasizes the importance of adopting a **regional framework within the IGAD region** that strengthens cooperation, coherent legal and institutional frameworks, enhances data sharing and intelligence systems, and enables joint surveillance and enforcement operations across transboundary aquatic ecosystems.

Central to this strategy is the need for the establishment of **IGAD Regional MCS Coordination Centre, taking the lessons from SADC MCS Centre**, which will serve as hubs for real-time data integration, fisheries intelligence, and coordinated enforcement actions. The policy also highlights the critical role of **modern surveillance technologies**, including satellite-based

monitoring technologies such as, Vessel Monitoring Systems (VMS), Automatic Identification Systems (AIS), electronic monitoring System (EMS) and electronic reporting System (ERS), to enhance detection, compliance, and enforcement efficiency. Equally important is the strengthening of the full enforcement chain detection, investigation, and prosecution, supported by robust legal frameworks, effective judicial systems, and enhanced institutional capacity.

Beyond enforcement, the Policy Orientation Paper underscores the need to integrate MCS systems into **aquatic biodiversity conservation and ecosystem-based management approaches**. This includes the protection of critical habitats such as coral reefs, mangroves, seagrass beds, wetlands, and spawning grounds, as well as the restoration of degraded ecosystems and rebuilding of depleted fish stocks. It further recognizes the importance of **community engagement and co-management systems**, which enhance compliance, leverage local knowledge, and contribute to sustainable resource use.

The policy also highlights the growing urgency of addressing **climate change and environmental degradation**, which are reshaping aquatic ecosystems and increasing the vulnerability of dependent communities. Strengthening MCS systems, therefore, must be complemented by measures that enhance climate resilience, promote sustainable livelihoods, and support ecosystem-based adaptation.

Ultimately, the call for a **transformational shift toward a unified, regionally coordinated MCS architecture** that is supported by strong political commitment, sustainable financing, and multi-stakeholder partnerships is critical. Such a system will be pivotal in combating IUU fishing, safeguarding aquatic biodiversity, enhancing fisheries productivity, and advancing inclusive blue economy development across the IGAD region. Furthermore, a coordinated, technology-driven, and ecosystem-based regional MCS system is essential for securing the sustainability of aquatic ecosystems, strengthening economic resilience, and safeguarding the livelihoods of millions across the IGAD region.

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1.0 Background and Context

The sustainable management of Africa's fisheries, aquaculture, and aquatic biodiversity is a strategic priority for the African Union (AU) due to its vital role in food security, livelihoods, employment, trade, and economic growth. Across Africa, especially in coastal and inland regions such as the IGAD area, aquatic resources support millions of people and contribute significantly to GDP and exports. These ecosystems also provide essential services including biodiversity support, carbon sequestration, and shoreline protection, making their conservation economically and environmentally critical.

The AU, through AU-IBAR and IGAD, supports Member States in managing these resources using frameworks like the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS) and the Africa Blue Economy Strategy (ABES), IGAD Regional Blue Economy Strategy aligned with Agenda 2063. With support from partners such as Sida, programmes have been implemented to strengthen governance, regulatory systems, and institutional capacity, while promoting sustainable use, conflict reduction among sectors, and inclusive governance.

Despite progress, major challenges persist, particularly Illegal, Unreported and Unregulated (IUU) fishing, which depletes fish stocks, harms biodiversity, and undermines economic benefits. Weak Monitoring, Control and Surveillance (MCS) systems, characterized by limited capacity, poor coordination, and insufficient funding, further exacerbate the problem. These systems are often fragmented and lack regional integration, reducing effectiveness in managing transboundary resources.

Although regional bodies like RFBS, RFMOs, RECs and basin authorities exist, they face constraints including weak coordination, limited resources, and fragmented mandates. Additionally, MCS efforts have largely focused on fisheries compliance, often neglecting broader biodiversity conservation such as protection of critical habitats. AU-IBAR and IGAD initiated efforts to strengthen MCS systems through capacity building, improved coordination, and regional collaboration. However, aquatic ecosystems continue to face pressures from climate change, pollution, habitat destruction, and invasive species. Strengthening integrated and regionally coordinated MCS systems is therefore essential to enhance enforcement, protect biodiversity, and support sustainable fisheries within Africa's Blue Economy framework and IGAD Regional Blue Economy Strategy.

1.1 The Regional Problem

The IGAD region faces persistent and interconnected challenges in the governance of fisheries, aquatic biodiversity, and ecosystem health, largely driven by weak and fragmented Monitoring, Control and Surveillance (MCS) systems. Despite the critical socio-economic and ecological importance of aquatic resources in marine and inland systems, the region continues to experience high levels of Illegal, Unreported and Unregulated (IUU) fishing, habitat degradation, and biodiversity loss. Existing MCS frameworks are constrained by limited technical and human capacity, inadequate infrastructure and financing, open access fisheries, weak inter-agency coordination, and insufficient regional integration, which is particularly problematic given the transboundary nature of key water bodies and fish stocks. Furthermore, current approaches often prioritize fisheries compliance with limited integration of ecosystem-based management and biodiversity conservation objectives. These challenges are exacerbated by emerging pressures such as political instability, climate change, pollution, and competing blue economy activities. IGAD Secretariat has been supporting Member States to enhance Blue Economy for biodiversity conservation and livelihood diversification, through Sida financed project (2021 – 2025). Through IGAD's support all Member States developed and endorsed national Blue Economy Strategies. The IGAD Blue Economy Strategy and national Blue Economy strategies of its Member States shows clearly the need for a coherent, regionally coordinated framework that strengthens MCS systems, enhances data sharing and joint enforcement, and integrates sustainable fisheries management with aquatic ecosystem conservation to ensure long-term resilience and socio-economic benefits for the IGAD region.

2.0 Strategic Rationale for Regional Approach

A regional approach to strengthening Monitoring, Control and Surveillance (MCS) systems, aquatic biodiversity conservation, and ecosystem management in the IGAD region is strategically justified by the transboundary nature of aquatic ecosystems and the shared dependence of Member States on these resources. Major water bodies, including shared lakes, river basins, and coastal zones support interconnected fish stocks and ecological processes that cannot be effectively managed through isolated national efforts. Disparities in policy frameworks, enforcement capacity, and institutional effectiveness across countries create regulatory gaps that are often exploited by operators engaged in Illegal, Unreported and Unregulated (IUU) fishing and other unsustainable practices. A coordinated regional framework enables harmonization of policies and standards, facilitates real-time information and data sharing, and strengthens joint surveillance and enforcement actions. It also enhances economies of scale in capacity building, infrastructure investment, and technology deployment, while fostering peer learning and institutional collaboration. Importantly, a regional approach provides a platform to integrate ecosystem-based management, address cumulative impacts from multiple sectors, and respond collectively to emerging threats such as climate change, pollution, and biodiversity loss. By aligning national efforts with regional priorities and continental frameworks, the IGAD region can improve governance effectiveness, safeguard shared aquatic ecosystems, and maximize sustainable socio-economic benefits from its blue economy resources.

2.1 MCS as Biodiversity Governance and Conservation Tool

Monitoring, Control and Surveillance (MCS) systems constitute the operational backbone of fisheries governance and are indispensable for achieving both sustainable fisheries management and effective aquatic biodiversity conservation. At their core, MCS systems provide the mechanisms through which fisheries regulations, conservation measures, and ecosystem protection policies are implemented, enforced, and continuously evaluated. In the context of the IGAD region where fisheries resources are under increasing pressure and governance systems face multiple constraints strengthening MCS is not only a compliance requirement but a strategic necessity for safeguarding ecological integrity and sustaining livelihoods.

In fisheries management, MCS plays a central role in **preventing overexploitation and ensuring adherence to management measures**. By tracking fishing effort and verifying compliance with regulations such as catch limits, gear specifications, and closed seasons, MCS systems help maintain fish stocks at sustainable levels. This is particularly important in regions characterized by open-

access fisheries and limited regulatory oversight, where the absence of effective MCS can lead to rapid depletion of resources. Through improved monitoring and enforcement, MCS systems enable governments to regulate access to fisheries, reduce illegal practices, and create a level playing field for compliant fishers.

Beyond fisheries compliance, MCS systems are increasingly recognized as critical tools for **aquatic biodiversity conservation**. Aquatic ecosystems are complex and interconnected, and unsustainable fishing practices can have cascading effects on habitats, species diversity, and ecosystem functioning. MCS systems support conservation by enforcing spatial management measures such as Marine Protected Areas (MPAs), fish breeding sanctuaries, and no-take zones. They also help prevent destructive practices such as dynamite fishing, fishing with illegal gears such as monofilament gillnets, bottom trawling in sensitive habitats, and harvesting of threatened, endangered, and protected (TEP) species.

Importantly, MCS contributes to the implementation of **ecosystem-based fisheries management (EBFM)**, which moves beyond single-species management to consider the broader ecological relationships within aquatic systems. Through integrated monitoring of fisheries and environmental parameters, MCS systems can provide critical insights into ecosystem health, enabling managers to assess the impacts of fishing on habitats, biodiversity, and ecosystem services. This integrated approach supports more holistic and adaptive management strategies that balance resource use with conservation objectives.

In the IGAD region, where many aquatic ecosystems are transboundary, MCS systems play a vital role in **facilitating regional cooperation and coordinated management**. Shared fish stocks and interconnected ecosystems require harmonized regulations and joint enforcement efforts. MCS systems enable information sharing, joint surveillance operations, and coordinated responses to illegal activities across national boundaries. This is particularly important in combating IUU fishing, which often exploits gaps in national jurisdictions and weak regional coordination.

Incorporating **community-based approaches** into MCS systems further enhances their effectiveness, particularly in small-scale fisheries. Local communities often possess valuable knowledge of fishing activities and ecosystem dynamics, and their involvement in monitoring and enforcement can improve compliance and reduce enforcement costs. Co-management arrangements, where communities share responsibility for resource management with government authorities, have shown positive outcomes in terms of both conservation and livelihoods.

However, despite their importance, MCS systems in many parts of the IGAD region remain constrained by limited resources, inadequate infrastructure, and insufficient technical capacity. Addressing these challenges requires sustained investment in human resources, institutional strengthening, and adoption of modern technologies such as Vessel Monitoring Systems (VMS), Automatic Identification Systems (AIS), and electronic monitoring tools. It also requires the integration of MCS into broader policy frameworks for biodiversity conservation, climate adaptation, and blue economy development.

Evidently, **MCS systems are not merely enforcement tools but** integrated governance instruments that underpin sustainable fisheries and aquatic biodiversity conservation**. By strengthening MCS systems and expanding their scope to include ecosystem-based approaches, IGAD Member States can enhance resource sustainability, protect critical habitats, and ensure that aquatic ecosystems continue to provide essential services for current and future generations**

3.0 Status of MCS, Aquatic Biodiversity and Ecosystems in the IGAD Region

The IGAD region comprising Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda, is endowed with a wide range of ecologically and economically significant aquatic ecosystems. These include the Red Sea and Gulf of Aden coastal and marine systems, the Western Indian Ocean seascape, major inland lakes such as Victoria, Turkana, Albert, Tana and Kyoga, as well as extensive river basins including the Nile and its tributaries. In addition, wetlands such as the Sudd Wetland, floodplains, estuaries, mangroves, seagrass beds, and coral reef systems provide critical habitats for diverse aquatic species and support fisheries that are central to food security, employment, and rural livelihoods across the region.

Despite this ecological richness, aquatic biodiversity, including fish stocks, in the IGAD region is increasingly under threat from a combination of anthropogenic and environmental pressures. Overfishing and IUU fishing remain among the most significant drivers of biodiversity loss, exacerbated by weak regulatory enforcement and open-access fishing regimes in many areas. The use of illegal fishing gears, destructive fishing methods, and fishing in restricted or protected areas has led to declining fish stocks, habitat degradation, and disruption of ecosystem functions. Inland fisheries, particularly in shared water bodies such as Lake Victoria and the Nile Basin, are also experiencing pressure from overexploitation and inadequate cross-border management.

Habitat degradation is another major concern, driven by coastal development, mangrove deforestation, wetland encroachment, sand mining, and unsustainable land-use practices. Critical ecosystems such as coral reefs, seagrass beds, and mangroves which serve as breeding and nursery grounds for many fish species are being degraded at alarming rates. In inland systems, pollution from agricultural runoff, industrial effluents, and urban waste is leading to eutrophication, reduced water quality, and loss of biodiversity. The spread of invasive species, such as water hyacinth in freshwater systems, further compounds these challenges by disrupting ecological balance and affecting fisheries productivity.

Climate change is intensifying these pressures across the IGAD region. Rising sea temperatures, ocean acidification, and coral bleaching are affecting marine ecosystems, while changing rainfall patterns, prolonged droughts, and flooding events are altering freshwater systems. These changes are impacting fish distribution, productivity, and ecosystem resilience, with significant implications for food security and livelihoods. The region's high dependence on climate-sensitive natural resources makes it particularly vulnerable to these impacts, necessitating urgent adaptation and resilience-building measures.

At the regional level, while there are existing frameworks and institutions such as regional fisheries bodies, river basin organizations, and environmental conventions these mechanisms are not always effectively coordinated or adequately resourced to support comprehensive MCS systems. Assessments have shown that existing regional MCS initiatives are largely focused on combating IUU fishing, with limited integration of broader ecosystem and biodiversity conservation objectives. Furthermore, challenges such as weak political commitment, inconsistent policy implementation, and limited financing undermine the sustainability and effectiveness of these initiatives.

Another critical gap is the **limited level of real-time data sharing and fisheries intelligence coordination** among IGAD Member States. Effective MCS systems require timely and accurate information on vessel movements, fishing activities, and compliance status. However, the absence of integrated regional data platforms and standardized reporting systems hampers the ability of countries to detect and respond to illegal activities, particularly in transboundary waters.

Despite these challenges, there are important opportunities and emerging initiatives that can be leveraged to strengthen MCS systems and biodiversity conservation in the region. Several countries have begun adopting modern surveillance technologies, including satellite-based monitoring and electronic reporting systems, although coverage and integration remain limited. Regional cooperation efforts, including joint training programmes and knowledge-sharing platforms facilitated by AU-

IBAR and IGAD, have contributed to building capacity and promoting best practices. The existence of regional policy frameworks and institutional arrangements provides a foundation upon which more integrated and sustainable MCS systems can be developed.

There is also increasing recognition of the need to adopt **ecosystem-based and integrated approaches to fisheries management**, which link MCS systems with broader environmental and biodiversity conservation objectives. This includes expanding the scope of MCS to cover protection of Marine Protected Areas (MPAs), biodiversity hotspots, and critical habitats, as well as addressing emerging threats such as pollution and climate change. Strengthening community participation through co-management approaches and integrating traditional knowledge systems can further enhance compliance and sustainability at the local level.

Lastly, while the IGAD region possesses significant aquatic biodiversity and institutional frameworks for its management, the current status of MCS systems remains inadequate to effectively address the scale and complexity of existing challenges. Strengthening these systems through enhanced capacity, technology adoption, legal harmonization, and regional coordination is essential for safeguarding aquatic ecosystems, ensuring sustainable fisheries, and supporting the long-term resilience of communities and economies in the region.

3.1. Combating IUU Fishing; Detection, Investigation and Prosecution

Illegal, Unreported and Unregulated (IUU) fishing is a major threat to sustainable fisheries and aquatic biodiversity in Africa and, not least, in the IGAD region. It includes offenses such as unauthorized fishing, use of illegal gear, misreporting of catches, illegal transshipment, and targeting protected species. These activities deplete fish stocks, damage ecosystems, distort markets, and undermine governance and livelihoods. Addressing IUU fishing requires a comprehensive enforcement approach integrating detection, investigation, and prosecution within strong legal and institutional systems.

Addressing IUU fishing also depends on a balance of voluntary compliance (doing the right thing willingly) and effective comprehensive enforcement (ensuring consequences for violations) approach. Relying solely on enforcement is expensive and less effective without the support and cooperation of fishers, in a comanagement approach or community based MCS where applicable.

Detection relies on both traditional methods (patrols, aerial surveillance, port and landing inspections), observer programme, and utilization of modern technologies such as Vessel Monitoring Systems (VMS), Automatic Identification Systems (AIS), satellite imagery, and electronic monitoring. These tools improve real-time tracking and identification of suspicious activities, while community-based reporting supports surveillance, particularly in small-scale fisheries. Increasingly, risk-based and intelligence-led approaches are used to prioritize enforcement by integrating multiple data sources to identify high-risk operations.

Investigation follows detection and requires technical, legal, and operational capacity to gather and evidence gathering and analysis, such as tracking data, logbooks, and inspection reports. This process often involves multiple agencies and, in some cases, financial crime units. However, limited forensic and investigative capacity in the IGAD region weakens enforcement outcomes, highlighting the need for training, standardized procedures, improved data systems, and stronger inter-agency and regional cooperation, especially for transboundary cases.

Prosecution remains the weakest link in the enforcement chain. Effective prosecution depends on clear and harmonized legal frameworks with strong penalties. In many cases, sanctions are too weak to deter IUU fishing. Strengthening laws to include significant fines, confiscation, and license revocation is essential. Judicial capacity is also critical, requiring training and resources to handle technical cases and ensure consistent application of laws.

IUU fishing is often linked to broader transnational crimes such as human trafficking, forced labor, and smuggling, necessitating a whole-of- Inter-government department/agencies approach that integrates fisheries enforcement with wider law enforcement systems. Port State Measures play a key role by preventing illegal fish from entering markets through inspections and denial of port access, while stronger Flag State control is needed to address abuses such as flags of convenience, put in place traceability and catch certification system.

Despite challenges, opportunities exist through digital technologies, regional cooperation, and increased political commitment. Joint patrols, shared surveillance assets and systems, and regional intelligence networks can enhance enforcement effectiveness. Overall, combating IUU fishing requires a coordinated, multi-layered approach that strengthens detection, investigation, prosecution and improved compliance to protect biodiversity and ensure sustainable fisheries in the IGAD region.

3.2. Enhancing Global and Regional Instruments to Combat IUU Fishing

The fight against Illegal, Unreported and Unregulated (IUU) fishing is inherently transboundary, as fish stocks, fishing fleets, and seafood supply chains operate across national boundaries. Global and regional legal instruments therefore provide the foundation for coordinated action and aquatic biodiversity conservation. However, in the IGAD region, their effectiveness is constrained by limited ratification, weak domestication into national laws, and inadequate implementation capacity.

The United Nations Convention on the Law of the Sea (UNCLOS, 1982) establishes the overarching legal framework for ocean governance and fisheries management, while specialized agreements strengthen enforcement. The FAO Port State Measures Agreement (PSMA, 2016) is a key tool that targets IUU fishing by denying port access to non-compliant vessels, though its implementation in the IGAD region is often limited by capacity and infrastructure gaps. Similarly, the FAO Compliance Agreement and the UN Fish Stocks Agreement (UNFSA, 1995) emphasize flag State responsibility and regional cooperation for managing migratory and shared fish stocks.

Broader environmental instruments such as the Convention on Biological Diversity (CBD, 1992) and the Convention on International Trade in Endangered Species (CITES, 1975) also support biodiversity conservation and regulate trade in threatened species. However, a major challenge remains the gap between commitment and implementation, with weak legal frameworks, overlapping institutional mandates, insufficient penalties, and limited technical and financial capacity hindering effectiveness.

Improving implementation requires several key actions. First, countries need to accelerate ratification and domestication of international agreements into national legislation, ensuring alignment with global standards. Second, institutional and operational capacity must be strengthened through training, infrastructure investment, and integration of these instruments into national MCS systems. Third, enhanced regional cooperation is essential to harmonize regulations, share information, and conduct joint enforcement in managing shared ecosystems.

Additionally, leveraging digital technologies, such as vessel tracking and electronic catch documentation, can improve transparency, traceability, and compliance monitoring. Strengthening accountability mechanisms, including monitoring systems and stakeholder engagement, is also critical.

Overall, while global instruments provide a strong framework for combating IUU fishing and conserving aquatic biodiversity, their effectiveness in the IGAD region depends on improved legal alignment, stronger institutional capacity, enhanced regional cooperation, and better use of technology.

4.0. Flag and Port State Obligations and Responsibilities

The effectiveness of global and regional efforts to combat Illegal, Unreported and Unregulated (IUU) fishing and to conserve aquatic biodiversity depends fundamentally on the **clear definition and enforcement of responsibilities among Flag States and Port States**. These two pillars of fisheries governance operate at different but complementary points along the fisheries value chain Flag States regulate vessels at sea, while Port States control access to markets and landing facilities. Together, they form a critical enforcement architecture that can significantly reduce the incidence and profitability of IUU fishing when properly implemented and coordinated.

4.1 Flag State Responsibilities and Obligations

Flag States, countries under whose jurisdiction fishing vessels are registered, bear the **primary responsibility for regulating and controlling the activities of vessels flying their flag**, whether operating within national waters or on the high seas. This responsibility is grounded in international law, particularly under the United Nations Convention on the Law of the Sea (UNCLOS) and complemented by instruments such as the FAO Compliance Agreement and the UN Fish Stocks Agreement.

At the core of Flag State obligations is the requirement to ensure that vessels are **properly authorized, licensed, monitored and compliant with applicable conservation and management measures**. This includes maintaining accurate and up-to-date vessel registries, issuing fishing licenses based on clear criteria, and ensuring that vessels operate only in authorized areas and fisheries. Flag States must also ensure that vessels adhere to regulations concerning fishing gear, catch limits, species protection, and reporting requirements.

A critical function of Flag States is the **monitoring and control of vessel activities**, which increasingly relies on the use of technologies such as Vessel Monitoring Systems (VMS), Automatic Identification Systems (AIS), electronic Monitoring system (EMS) and electronic reporting system (ERS). These tools enable authorities to track vessel movements, and their activities, verify compliance with spatial restrictions, and detect suspicious activities such as unauthorized transshipment or

fishing in closed and restricted areas.

Flag States are also responsible for **ensuring transparency and accountability in fisheries operations**, including the submission of accurate catch data, reporting of fishing effort, and participation in regional data-sharing mechanisms. Failure to provide reliable data undermines stock assessments, weakens management decisions, and facilitates IUU fishing.

Enforcement is a central component of Flag State obligations. States must investigate alleged violations involving their vessels and impose **effective, proportionate, and dissuasive sanctions** where offenses are confirmed. This includes penalties such as fines, suspension or revocation of licenses, and, where appropriate, criminal prosecution. Weak enforcement by Flag States, particularly in cases involving "flags of convenience" remains one of the most significant loopholes exploited by IUU operators, allowing vessels to evade regulations and accountability.

In the IGAD region, strengthening Flag State performance requires addressing challenges such as limited technical capacity, weak regulatory frameworks, and insufficient monitoring infrastructure. Enhancing vessel registration systems, improving licensing procedures, and investing in surveillance and monitoring assets and technologies are essential steps toward fulfilling Flag State obligations effectively.

4.2 Port State Responsibilities and Obligations

Port States, countries that control ports where fishing vessels land their catch or access services play a **strategic role in disrupting IUU fishing by targeting its economic incentives**. By regulating port entry and services, Port States can prevent illegally caught fish from entering supply chains, thereby reducing the profitability of IUU operations.

The FAO Port State Measures Agreement (PSMA, 2016) provides the primary framework for Port State responsibilities, emphasizing the need for **strict port controls, inspections, and verification procedures**. Under this framework, Port States are required to designate specific ports for foreign fishing vessels, establish procedures for prior notification of port entry, and conduct risk-based inspections of vessels suspected of engaging in IUU fishing.

Port inspections involve verifying vessel documentation, including fishing licenses, catch records, and authorizations, as well as physically inspecting catches, fishing gear, and storage facilities. Where evidence of IUU activity is found, Port States have the authority to **deny port entry or use**

of port services, including landing, transshipment, refueling, and resupply. This effectively blocks illegal operators from accessing markets and logistical support.

Port States are also responsible for **sharing information with Flag States, regional organizations, and international bodies**. This includes reporting inspection results, notifying relevant authorities of suspected violations, and contributing to regional and global databases on fishing activities. Effective information sharing enhances transparency, supports coordinated enforcement actions, and helps identify repeat offenders operating across multiple jurisdictions.

In many African countries, including those in the IGAD region, the implementation of Port State Measures is constrained by **limited infrastructure, inadequate inspection capacity, and weak inter-agency coordination**. Ports often lack trained personnel, standardized procedures, and the necessary equipment to conduct thorough inspections. Strengthening Port State capacity requires investment in infrastructure, training, and the development of integrated systems that link port inspections with national MCS frameworks.

4.3 Complementarity and Integration of Flag and Port State Measures

The effectiveness of Flag and Port State measures lies in their **complementary roles within the fisheries governance system**. While Flag States are responsible for regulating vessel behavior at sea, Port States provide a critical checkpoint that can detect and deter illegal activities before products enter the market. When both systems function effectively and are well-coordinated, they create a comprehensive enforcement network that closes gaps exploited by IUU operators.

In the IGAD region, where many fisheries are transboundary and enforcement capacity varies across countries, **regional cooperation is essential** for aligning Flag and Port State responsibilities. This includes harmonizing legal frameworks, standardizing inspection procedures, and establishing mechanisms for real-time data sharing. Joint training programmes, regional databases, and coordinated enforcement operations can further enhance the effectiveness of these measures.

4.4 Key Challenges and Priority Actions

Despite their importance, several challenges limit the effectiveness of Flag and Port State responsibilities in combating IUU fishing. These include weak legal frameworks, insufficient penalties, lack of political will, limited technical capacity, and inadequate coordination among agencies and countries. Addressing these challenges requires a combination of policy, institutional, and operational reforms.

Priority actions include strengthening national legislation to align with international standards, enhancing capacity for vessel monitoring and port inspections, improving data management and information sharing systems, and promoting regional collaboration. In addition, there is a need to address systemic issues such as corruption, lack of transparency, and the use of flags of convenience, which undermine enforcement efforts.

Therefore, Flag States and Port States are central to the global effort to combat IUU fishing and protect aquatic biodiversity. Strengthening their responsibilities and obligations, through improved legal frameworks, enhanced capacity, technological adoption, and regional cooperation, will be critical for closing enforcement gaps, reducing illegal activities, and ensuring the sustainable management of fisheries resources in the IGAD region and beyond.

5.0 Technical Measures for Biodiversity Conservation

Protecting and restoring aquatic biodiversity in the IGAD region requires a comprehensive mix of technical, regulatory, and ecosystem-based measures supported by strong Monitoring, Control and Surveillance (MCS) systems and grounded in scientific evidence. Given the diversity of ecosystems from coral reefs and mangroves to lakes and wetlands interventions must be context-specific while promoting sustainability and resilience. These measures should be supported by critical scientific studies, such as on establishing ecologically or biologically significant marine areas (EBSAs).

Spatial and area-based management tools are central, including Marine Protected Areas (MPAs), no-take zones, seasonal closures, and marine spatial planning, particularly underlined within transboundary context. These measures protect critical habitats, support fish reproduction, and safeguard biodiversity hotspots such as coral reefs, seagrass beds, and wetlands. Complementing these are fisheries regulatory measures such as catch limits, effort controls, gear restrictions, and licensing systems, which help prevent overexploitation and reduce impacts on non-target species.

Habitat conservation and restoration are equally important, with interventions such as mangrove reforestation, coral reef rehabilitation, seagrass recovery, and wetland restoration enhancing biodiversity while supporting climate resilience and livelihoods. These efforts are reinforced by ecosystem-based management approaches that consider interactions between species, habitats, and human activities, and promote integrated planning across sectors.

Conservation of genetic diversity is also critical for long-term resilience, requiring monitoring of fish populations, maintenance of genetic integrity in restocking programmes, and ensuring connectivity between ecosystems. In parallel, pollution control and water quality management through stronger regulations, sustainable land use, and waste management are essential to protect aquatic ecosystems from degradation.

Climate adaptation measures, including protection of climate refugia and promotion of nature-based solutions such as mangrove and wetland conservation, help address climate-related risks. Community-based and co-management approaches further enhance effectiveness by involving local stakeholders, incorporating traditional knowledge, and improving compliance.

Plastics and Chemical pollutions are also identified a threat to aquatic biodiversity and environment and hence healthy ecosystems and fish stocks.

All these measures depend on robust MCS systems to ensure enforcement and compliance. Without effective monitoring and enforcement, conservation efforts may fail. Overall, a multi-dimensional, integrated approach combining spatial planning, regulation, restoration, ecosystem-based management, and community engagement is essential for conserving biodiversity, rebuilding fish stocks, and sustaining the IGAD region's blue economy.

6.0 Regional MCS Framework in the IGAD Region

The transboundary nature of aquatic ecosystems in the IGAD region requires strong regional cooperation to ensure effective Monitoring, Control and Surveillance (MCS) and sustainable biodiversity conservation and ecosystems management. Fish stocks migrate across shared waters, while IUU fishing operators exploit weak coordination and uneven enforcement, making isolated national efforts insufficient. Establishing integrated regional MCS systems is therefore essential.

Regional MCS frameworks enable collective action, resource pooling, and harmonized governance. They improve cost-efficiency, enhance intelligence sharing, and support coordinated responses to IUU fishing. Establishing regional coordination centres is key, providing hubs for real-time data analysis, joint patrol coordination, risk assessment, and capacity building, thereby improving operational efficiency and communication among Member States.

Harmonization of legal and regulatory frameworks is critical to close loopholes exploited by illegal operators. This includes harmonization of minimum terms and conditions of access in the fisheries in the region, aligning definitions of IUU offenses, penalties, licensing systems, and enforcement procedures. Similarly, integrated data-sharing systems, covering vessel tracking, catch documentation, and compliance records, are essential for transparency, traceability, and informed decision-making.

Joint surveillance and enforcement operations, such as coordinated patrols and shared use of assets, enhance coverage and effectiveness in transboundary waters. These efforts must be supported by sustained capacity building, including training personnel, strengthening institutions, and improving technical expertise across countries.

Regional MCS systems should also integrate ecosystem-based approaches, expanding beyond fisheries compliance to address habitat protection, pollution, and climate-related impacts; also promoting harmonized strategies for management of transboundary marine and ecosystems. However, sustainable financing remains a challenge, requiring diversified funding through Member States, development partners, and innovative mechanisms.

Finally, strong partnerships involving governments, regional bodies, international organizations, and local communities are essential for effective implementation. Overall, integrated regional MCS systems are critical for combating IUU fishing, conserving biodiversity, and ensuring sustainable fisheries and resilient ecosystems in the IGAD region.

7.0 Technology and Innovation in Combating IUU Fishing

The increasing scale and sophistication of Illegal, Unreported and Unregulated (IUU) fishing in the IGAD region have outgrown traditional Monitoring, Control and Surveillance (MCS) methods such as patrols and manual reporting. These approaches are no longer sufficient to monitor vast aquatic areas or respond effectively to technologically advanced illegal operations, creating an urgent need for modernization through advanced technologies and coordinated regional MCS centres.

Technology-driven MCS systems are essential in today's dynamic fisheries environment. Tools such as Vessel Monitoring Systems (VMS), Automatic Identification Systems (AIS), satellite imagery, and satellite aperture radar (SAR) enable real-time vessel tracking and detection of suspicious activities, even when tracking devices are disabled. Electronic Monitoring systems, digital logbooks,

and data analytics further enhance transparency and support intelligence-led enforcement, allowing authorities to prioritize high-risk vessels and optimize limited resources.

However, adoption of these technologies across the IGAD region remains uneven due to high costs, limited technical expertise, weak infrastructure, and inadequate data management systems. Existing MCS systems are often fragmented, with poor interoperability and limited data sharing and analysis, allowing IUU operators to exploit monitoring gaps.

To address these challenges, establishing regional MCS coordination centres is critical. These centres would integrate data from national systems, support real-time surveillance and early warning, facilitate joint enforcement operations, and provide fisheries intelligence and capacity building. By aggregating data from VMS, AIS, other satellite systems, and port inspections, they would offer a comprehensive regional picture of fishing activities, high risk areas and strengthen coordinated responses.

Ensuring interoperability among technologies is essential, requiring standardized data formats and integrated platforms that combine vessel tracking, catch documentation, compliance records, and environmental data. Enhanced onshore monitoring and decision-support systems, including Maritime Domain Awareness platforms, would further improve analysis, risk assessment, and enforcement planning.

While technology adoption requires significant investment, it offers cost-efficiency by reducing reliance on expensive patrols and enabling targeted enforcement based on risk analysis. Regional centres also promote harmonized data collection and sharing systems, resource sharing and economies of scale. However, success depends on sustained capacity building, including training personnel, strengthening institutions, and ensuring long-term financing through national budgets and partnerships.

Beyond enforcement, modern MCS systems contribute to broader governance objectives by supporting protection of conservation areas, detecting environmental crimes, integrating climate data, and improving traceability in fisheries value chains.

Overall, investing in technology-driven, integrated, and regionally coordinated MCS systems is essential for enhancing surveillance, combating IUU fishing, protecting aquatic biodiversity, and ensuring sustainable fisheries management in the IGAD region.

8.0 Climate Resilience and Community Adaptation in the IGAD Region

Communities in the IGAD region, particularly coastal, riparian, and lakeside populations, are highly vulnerable to climate change and environmental degradation due to their dependence on fisheries, aquaculture, and ecosystem services. Rising temperatures, sea-level rise, extreme weather events, pollution, and habitat loss are already affecting fish distribution, degrading critical ecosystems, and disrupting livelihoods. These impacts are compounded by poverty, weak infrastructure, and limited adaptive capacity.

Building resilience requires promoting climate-resilient livelihoods and reducing dependence on vulnerable fisheries. This includes sustainable aquaculture, alternative income sources such as eco-tourism and small nature-based enterprises, improved post-harvest practices, and access to climate-smart technologies. Ecosystem-based adaptation, characterized by nature-based solutions, is equally important, with measures such as restoring mangroves, wetlands, and seagrass beds, protecting coral reefs, and improving watershed management to enhance both biodiversity and climate resilience.

Community-based resource management plays a central role, empowering local populations through co-management systems, Locally Managed Marine Areas (LMMAs), and participatory monitoring within MCS frameworks. Strengthening access to climate information and early warning systems further supports informed decision-making and reduces vulnerability to climate shocks.

Inclusive and gender-responsive approaches are essential, ensuring women and youth have equitable access to resources, decision-making, and capacity-building opportunities. At the same time, improving access to finance, insurance, and social protection mechanisms enables communities to invest in adaptation and recover from climate-related losses.

Integrating climate considerations into governance and MCS systems enhances monitoring of environmental changes, supports enforcement of conservation measures, and informs adaptive management. Regional cooperation is also critical for sharing knowledge, coordinating strategies, and addressing transboundary challenges.

Overall, strengthening community resilience requires a holistic approach that combines livelihood diversification, ecosystem conservation, inclusive governance, and regional collaboration to sustain fisheries and protect aquatic biodiversity in the IGAD region.

9.0. A Call for Legal and Institutional Harmonization in the IGAD Region

Effective governance of fisheries and aquatic biodiversity in the IGAD region is fundamentally dependent on **robust, coherent, and harmonized legal and institutional frameworks**. While most Member States have established national laws, policies, and institutions governing fisheries, environment, and maritime affairs, these frameworks often remain **fragmented, inconsistently applied, and insufficiently aligned** with regional and international obligations. This fragmentation creates regulatory gaps and inconsistencies that are frequently exploited by Illegal, Unreported and Unregulated (IUU) fishing operators, undermining conservation efforts, weakening enforcement, and reducing the overall effectiveness of Monitoring, Control and Surveillance (MCS) systems.

Fisheries and aquatic biodiversity governance in the IGAD region is characterized by fragmented and inconsistent legal frameworks, often spread across fisheries, environmental, maritime, and wildlife laws. This fragmentation leads to overlapping mandates, conflicting provisions, inconsistent definitions of IUU fishing, and gaps in addressing emerging issues such as transshipment and ecosystem-based management. These weaknesses complicate enforcement and hinder effective cross-border cooperation.

Given the transboundary nature of aquatic resources, there is a strong need to harmonize legal frameworks across Member States. This includes aligning definitions of IUU offenses, licensing systems, fisheries management measures, and penalties. Harmonization reduces regulatory loopholes, facilitates joint enforcement, and strengthens coordinated prosecution efforts.

Institutional fragmentation further undermines governance, as responsibilities are distributed across multiple agencies with limited coordination, resulting in duplication, inefficiencies, and enforcement gaps. Strengthening institutional coordination requires clarifying mandates, establishing inter-agency mechanisms, and adopting whole-of-government approaches that integrate fisheries, environmental, and security objectives.

Alignment with regional and international instruments such as UNCLOS, the FAO Port State Measures Agreement (PSMA), the UN Fish Stocks Agreement, and the Convention on Biological Diversity (CBD) is also critical. This involves domestication of international agreements, development of implementing regulations, and strengthening institutional capacity to meet global obligations.

Another key priority is strengthening enforcement provisions, as weak penalties often fail to deter IUU fishing. Legal frameworks must include proportionate and dissuasive sanctions, along with improved provisions for investigation, evidence collection, and prosecution. Enhancing judicial capacity is equally important to ensure effective enforcement.

Modern frameworks must also integrate ecosystem-based and climate-responsive approaches, including protection of conservation areas, habitat restoration, and pollution control. In addition, stronger legal provisions for data governance such as mandatory reporting, vessel tracking, and data sharing are essential for transparency and evidence-based decision-making.

Effective implementation depends on capacity building, including training personnel, investing in infrastructure and technology, and developing operational procedures. Finally, promoting stakeholder engagement and inclusive governance through co-management systems, community participation, and incorporation of traditional knowledge, enhances compliance and sustainability.

Overall, harmonized, well-coordinated, and effectively enforced legal and institutional frameworks are fundamental for combating IUU fishing, strengthening MCS systems, enhancing regional cooperation, and ensuring sustainable management of aquatic resources in the IGAD region.

10.0. Financing and Sustainability

Sustainable financing is a critical enabler for effective Monitoring, Control and Surveillance (MCS), aquatic biodiversity conservation, and ecosystem management in the IGAD region. Given the high costs associated with surveillance infrastructure, advanced technologies, capacity building, and enforcement operations, reliance on short-term, project-based funding is insufficient to ensure long-term impact. A diversified and sustainable financing model is therefore required, combining national budget allocations, regional cost-sharing mechanisms, and support from development partners. Innovative financing approaches, such as blue economy investment frameworks, public-private partnerships, environmental levies, and results-based financing, can help mobilize additional resources while aligning conservation objectives with economic incentives. Integrating MCS and biodiversity priorities into national development plans and sectoral budgets is essential to secure domestic funding and political commitment. At the regional level, pooled financing mechanisms can support shared assets such as surveillance systems, data platforms, and coordination centres, improving cost-efficiency and economies of scale. Strengthening financial governance, transparency, and accountability will further enhance resource utilization and donor confidence. Ultimately, ensuring financial sustainability requires aligning funding streams with long-term strategic priorities, building institutional capacity for resource mobilization and management, and fostering partnerships that support resilient, adaptive, and self-sustaining MCS and conservation systems across the IGAD region.

11.0. Implementation Roadmap

An effective implementation roadmap for strengthening Monitoring, Control and Surveillance (MCS), aquatic biodiversity conservation, and ecosystem management in the IGAD region should follow a phased, results-oriented approach anchored in regional coordination and national ownership. In the short term (≤2 years), priority actions include conducting baseline assessments of existing MCS systems and legal frameworks, establishing a regional coordination mechanism within IGAD Member States, and initiating harmonization of policies and regulations. During this phase, Member States should also begin capacity building for MCS personnel, pilot data-sharing protocols, and deploy foundational technologies such as Vessel Monitoring Systems (VMS) and Automatic Identification Systems (AIS) in high-risk areas.

In the medium term (2-5 years), efforts should focus on operationalizing regional MCS coordination centres, scaling up integrated surveillance systems, and strengthening joint enforcement operations, including coordinated patrols and cross-border inspections. Legal harmonization should be advanced through aligned penalties, licensing systems, and compliance procedures, while ecosystem-based management approaches, such as protected areas, habitat restoration, and climate adaptation measures, are expanded and embedded into national frameworks. Investment in digital infrastructure, data analytics, and interoperability of systems will be critical, alongside strengthening judicial capacity and prosecution mechanisms to enhance deterrence.

In the long term (5-10 years), the roadmap should aim for fully integrated, technology-driven, and regionally coordinated MCS systems that support real-time surveillance, intelligence-led enforcement, and adaptive ecosystem management across the IGAD region. Sustainable financing mechanisms, including blue economy investments and regional funding pools, should be institutionalized to ensure continuity. Continuous monitoring, evaluation, and learning frameworks will be essential to track progress, inform policy adjustments, and ensure resilience to emerging challenges such as climate change and evolving IUU fishing practices. Ultimately, the roadmap should deliver a cohesive regional system that safeguards aquatic biodiversity, enhances fisheries sustainability, and supports inclusive socio-economic development.

12.0. Key Policy Recommendations

Key policy recommendations for strengthening Monitoring, Control and Surveillance (MCS), aquatic biodiversity conservation, and ecosystem management in the IGAD region should focus on coherence, enforcement, and regional integration:-

- ***Harmonize Legal and Regulatory Frameworks***
  Align national laws across Member States by standardizing definitions of IUU fishing, licensing systems, gear regulations, and penalties. Domesticate relevant international instruments and ensure consistency to enable effective cross-border enforcement and prosecution.

- ***Establish and Institutionalize Regional MCS Systems***
  Create IGAD-led regional MCS coordination centre to facilitate real-time data sharing, joint surveillance, and intelligence-led enforcement. Develop interoperable systems integrating VMS, AIS, satellite monitoring, and port inspection data.

◊ ***Strengthen Enforcement and Deterrence Mechanisms***

Enhance penalties to be proportionate and dissuasive, including fines, license revocation, and confiscation of assets. Build judicial and prosecutorial capacity to handle fisheries-related cases effectively and ensure consistent application of laws.

◊ ***Invest in Technology and Digital Transformation***

Scale up adoption of advanced monitoring technologies, data analytics, and electronic reporting systems. Promote interoperability, standardization of data protocols, and integration of environmental monitoring into MCS platforms.

◊ ***Integrate Ecosystem-Based and Climate-Responsive Approaches***

Embed ecosystem-based fisheries management, habitat protection, and climate adaptation into policy frameworks. Strengthen legal provisions for conservation areas, restoration, and pollution control.

◊ ***Enhance Regional Cooperation and Joint Operations***

Promote coordinated patrols, shared surveillance assets, and regional intelligence networks. Strengthen collaboration with regional and international bodies to address transboundary challenges and organized IUU fishing networks.

◊ ***Build Institutional and Human Capacity***

Invest in training for MCS personnel, enforcement officers, and judicial actors. Strengthen inter-agency coordination mechanisms and develop standardized operating procedures across countries.

◊ ***Secure Sustainable Financing Mechanisms***

Increase domestic budget allocations and establish regional funding pools. Leverage innovative financing such as blue economy investments, public–private partnerships, and environmental levies to sustain MCS and conservation efforts.

◊ ***Promote Inclusive and Community-Based Governance***

Support co-management systems, community monitoring, and stakeholder participation. Ensure gender-responsive policies and equitable access to resources, finance, and decision-making processes.

◊ ***Strengthen Data Governance, Transparency, and Accountability***
Mandate reporting, vessel tracking, and data sharing across agencies and borders. Establish monitoring and evaluation systems to track performance, improve compliance, and support evidence-based decision-making.

Collectively, these policy actions provide a comprehensive framework for improving governance effectiveness, combating IUU fishing, conserving aquatic biodiversity, and advancing a sustainable and resilient blue economy in the IGAD region.

Conclusion

The sustainable management of fisheries, aquatic biodiversity, and ecosystems in the IGAD region hinges on the establishment of robust, integrated, and regionally coordinated Monitoring, Control and Surveillance (MCS) systems. The persistence of Illegal, Unreported and Unregulated (IUU) fishing, coupled with fragmented legal frameworks, weak institutional capacity, political instability and growing pressures from climate change and environmental degradation, underscores the urgency for a comprehensive and harmonized response. Addressing these challenges requires aligning national policies with regional and international frameworks, strengthening enforcement and deterrence mechanisms, and leveraging modern technologies to enhance surveillance, data sharing, and intelligence-led operations.

Equally important is the adoption of ecosystem-based and climate-responsive approaches that safeguard critical habitats, restore degraded ecosystems, and build resilience among vulnerable communities. Regional cooperation must serve as the cornerstone of this effort, enabling Member States to pool resources, harmonize regulations, and undertake joint actions to manage shared aquatic resources effectively. Sustainable financing, institutional strengthening, and inclusive governance, particularly the active participation of local communities, women, and youth, are essential to ensure long-term impact and ownership.

Ultimately, by advancing a coherent regional strategy that integrates governance, technology, conservation, and socio-economic considerations, the IGAD region can significantly enhance its capacity to combat IUU fishing, protect aquatic biodiversity, and unlock the full potential of its blue economy. This will not only secure ecological sustainability but also contribute to food security, livelihoods, and resilient economic development for present and future generations.

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POLICY DOCUMENT

STRENGTHENING REGIONAL MCS SYSTEMS FOR PROTECTION OF AQUATIC BIODIVERSITY AND ENVIRONMENT IN THE IGAD REGION

A Call for Enhanced Capacity Building



EFFECTIVE MCS
Smart monitoring, strong enforcement, safe oceans

BIODIVERSITY PROTECTION
Conserving habitats, species and ecosystems

REGIONAL COOPERATION
Working together for shared aquatic resources

CAPACITY & RESILIENCE
Building skills, institutions and sustainable futures

HEALTHY ECOSYSTEMS.
SUSTAINABLE FISHERIES.
RESILIENT COMMUNITIES.