

Fish and Fisheries

Illegal, unreported, and unregulated fishing in small-scale fisheries and impacts on ocean conservation and blue economy in the Western Indian Ocean

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Summary

The African Coastal waters harbour some of the most ecologically rich marine resources globally, supporting livelihoods, food security and other ecosystem services and serving as a substantial revenue stream for coastal communities. Yet increasing pressure from Illegal, Unreported and Unregulated (IUU) fishing threatens the vitality of the oceans and the communities that depend on them. IUU fishing activities in the Western Indian Ocean (WIO) region are particularly alarming, constituted by the destructive fishing practices of artisanal fleets and illegal industrial foreign-driven fishing. Taken together, IUU fishing practices cause overfishing and loss of habitat, loss of opportunities for income generation, physical injuries and loss of lives. The aggregate of IUU in the WIO and coastal regions worldwide costs as much as 80 billion USD per year in lost economic opportunity, impeding nations' ability to meet Sustainable Development Goals (SDGs) and Aichi Target 6 of the Convention on Biological Diversity. The Southern African Development Community (SADC) 16 member states, South-West Indian Ocean Fisheries Commission (SWIOFC), Nairobi Convention and other key institutions and partnerships demonstrate promise in supporting efforts to stop IUU Fishing and provide technical IUU Fishing Solutions. However, to date, many of the strategies being employed to halt IUU fishing and support sustainable fisheries management in the WIO focus on industrial offshore fishing, largely overlooking artisanal/small-scale fisheries. Artisanal/small-scale fisheries remain severely under-served and poorly regulated due to data scarcity, inconsistent policies, laws and regulations, and lack of consensus to counter IUU fishing and track the impact of anti-IUU fishing measures. There is an urgent need for information, analysis of data, sharing of data and collaboration to improve monitoring of small-scale fleets and small-scale fishing practices. Without substantial intervention, IUU fishing will continue to face the eradication of key artisanal fishery stocks, along with immense negative consequences to the larger marine ecosystem, coastal communities, and nations within the WIO and beyond. Both policy and technical solutions will be needed to curb IUU fishing in the WIO, including agreement by the Parties to the Nairobi Convention around IUU fishing as an environmental, social, and economic issue, the development of a WIO regional plan of action, completion of a WIO regional threat assessment, and the establishment of a regional inter-sectoral IUU fishing expert panel.

Background

African coastal waters contain some of the richest fisheries in the world and increasingly contribute to Africa's food security, foreign exchange, employment, and livelihood support services (Obiero and others, 2019). African fisheries provide an estimated economic value of more than US\$24 billion, accounting

for 1.26 per cent of the gross domestic product (GDP) of all African countries and have nearly doubled fish production over the last 20 years (de Graaf and Garibaldi 2014; FAO 2020). The African Union Development Agency estimates that 10.4 million tonnes of total fishery production in the region feed more than 30 per cent of the continent's population, or roughly

200 million people (Obiero and others, 2019). As of 2018, the Food and Agriculture Organization (FAO) estimates that more than five million people in Africa work in the fisheries and aquaculture sector (FAO 2020). However, African fisheries and associated livelihoods are being threatened by illegal activities, requiring a coordinated regional approach involving cooperation across borders.

The Challenge of Illegal, Unreported and Unregulated fishing

IUU fishing is among the most significant global threats to securing sustainable fisheries for both present and future generations. In broad terms, IUU fishing refers to fishing activities that do not comply with regional, national, or international fisheries conservation or management measures.¹ IUU fishing encompasses a range of illicit activities, including fishing without permission or out of season; harvesting prohibited species; using outlawed types of fishing gear; disregarding catch quotas, or non-reporting or under-reporting catch weights. In addition, fishing vessels of various flags have taken advantage of the absence of strong enforcement mechanisms in coastal countries (FAO 2007). Often connected to transnational crimes, including human rights abuses, piracy, and drug, arms, and human trafficking, IUU fishing poses a significant threat to global fisheries and the health and conservation of the ocean (Widjaja and others., 2019). Legal fishing activity and associated livelihoods are constantly being undermined by illegal activity. The use of illegal gear leads to species loss and diminishes biodiversity, which threatens food and economic security. In addition, unreported fishing creates inaccuracies in scientific data, resulting in challenges for implementing sustainable fisheries management practices (Widjaja and others, 2019). Illicit marine resource trade in Africa, including IUU fishing, is estimated to cost the continent between US\$7.6 and US\$13.9 billion and US\$1.8 and US\$3.3 billion in losses annually in economic and income impacts, respectively (Sumaila and others, 2020). Within African nations' Exclusive Economic Zones (EEZ), a substantial portion of the illegal catch is made by domestic artisanal fleets and

industrial fleets encroaching into nearshore exclusive artisanal zones and/or small-scale fisheries (AU-IBAR, 2016).

IUU Fishing in artisanal fisheries in the WIO

IUU fishing activities conducted in artisanal/small-scale fisheries within the Western Indian Ocean (WIO) region are increasing at an alarming rate, resulting in negative biological, economic and environmental consequences that may undermine the future of sustainable fisheries (Drammeh 2007; Stop Illegal Fishing 2017). IUU fishing practices in small-scale fisheries, also commonly referred to as “overfishing” and “destructive fishing” practices, including the use of explosives and poisons to kill fish; the use of fine mesh fishing nets and other destructive gears and techniques; the use of traps and weirs; the destruction of mangroves and coral reefs; and the catch of juvenile and immature fish and invertebrates, among others (Widjaja and others, 2019).² In addition to destructive fishing activities conducted by artisanal fleets, industrial foreign-driven IUU fishing vessels often illegally encroach nearshore areas, commonly used by small-scale fishers. The encroachment may result in conflicts over spatial use of marine zones and food insecurity due to overfishing and damage to boats and gear (AU-IBAR 2016). Unreported fish catch consequences are substantial and affect coastal communities disproportionately, especially when considering that artisanal fisheries account for 50 per cent of the world catch and employ 90 per cent of all fishers (Fluet-Chouinard and others, 2018). For example, with more than a dozen countries fishing illegally in its waters, Somalia has lost millions of tonnes of fish, reportedly more than 80 per cent than officially reported. Consequently, it impacts the socio-economic fabric of its coastal communities and its ability to effectively and sustainably manage its fisheries (Makoni 2017). While artisanal/small-scale fisheries are critical for supplying employment and income, most research and strategies to combat IUU fishing are specific to offshore larger-scale industrial fisheries.

Advances

IUU fishing and governance within artisanal/small-scale fisheries remain severely under-serviced and poorly regulated due to several factors, including

¹ The FAO's International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) provides the following definition of IUU fishing: Activities are classified as illegal fishing takes place when vessels or harvesters operate in violation of the laws of a fishery. Unreported fishing is fishing that has been unreported or misreported to the relevant national authority or regional fisheries management organization (RFMO), in contravention of applicable laws and regulations. Unregulated fishing generally, refers to fishing by vessels without nationality, vessels flying the flag of a country not party to the RFMO governing that fishing area or species on the high seas, or harvesting in unregulated areas. (FAO 2001)

² IUU fishing within small-scale fisheries is also commonly referred to as “illegal fishing,” “overfishing” or “destructive fishing.” In many cases, small-scale, artisanal catches are simply not reported because there is no official or legal mandate to record and report such catches, or even if there notionally is such a requirement, no data collection system or resources are in place to record and report all artisanal catches in many coastal communities.

inadequate research and support, insufficient human resources, and limited investments into sustainable fishery practices (Breuil and Yvergniaux 2014). The lack of sufficient data on the extent and impacts of IUU fishing performed by industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries restricts the ability to address the problem and measure the impact of any mitigating strategies. Furthermore, the inconsistent implementation of policies, laws, and regulations to counter IUU fishing and the general lack of cohesiveness and consensus amongst countries and their respective agencies weakens the impact of anti-IUU fishing interventions in the region. The lack of transparency and/or access to electronic data-gathering systems, insufficient information sharing between agencies and countries, general inability to accurately distinguish legal from illegal fish, and lack of capacity and resources hamper the ability to react to known IUU fishing threats.

Despite a growing IUU fishing problem impacting artisanal/small-scale fisheries in the WIO region, few actors have a comprehensive understanding of the scope and broader impacts of the problem. Economic incentives, weak governance, and barriers to enforcement remain primary drivers for IUU fishing, substantially undermining the potential for blue growth across the region (Widjaja and others., 2019).³ A concerted regional effort is critical to addressing the key drivers of IUU in artisanal/small-scale fisheries. Given that most governments in the WIO region have limited capability or capacity to manage small-scale fisheries on a sustainable basis, local fisheries' administrations/local communities cannot combat IUU fishing activities alone.

Unregulated IUU fishing in the nearshore environment by industrial foreign-driven and artisanal fishing fleets may damage the marine environment, deplete fish stocks, decrease the value of fisheries, increase food security risks, and disrupt the social cohesion of coastal communities' (Widjaja and others, 2019). IUU will continue to be one of the leading barriers to effective marine conservation efforts, limiting positive impacts for communities, thwarting management effectiveness and impeding the potential expansion of spatial protections such as marine protected areas (MPAs) and Locally Managed Marine Areas (LMMAs).

³ Blue growth, or environmentally sustainable economic growth based on the oceans, is a strategy of sustaining economic growth and job creation necessary to reduce poverty in the face of worsening resource constraints and climate crisis.

Along with lost social and environmental conservation opportunities, continued IUU fishing results in substantial net losses to countries' economies. Eliminating IUU could add US\$30 to \$45 billion to the GDP of coastal states in Africa, increase job opportunities, support livelihoods, increase social protection and reduce food insecurity and poverty in many of Africa's poorest countries (AU-IBAR 2016).

Efforts to Combat IUU

Globally, IUU fishing costs roughly US\$80 billion annually in foregone economic benefits. Consequently, economic growth and food production, and the ability of coastal states to meet several of the 2030 Sustainable Development Goals (SDGs) and Convention on Biological Diversity's Aichi Target 6 are undermined (The World Bank 2017).⁴ A failure to curb IUU fishing will result in a widespread inability to meet the SDGs, including SDG 1: No Poverty; SDG 2: No Hunger; SDG 3: Good health and well-being; SDG 8: Decent work and economic growth; SDG 11: Sustainable cities and communities; SDG 14: Life below water; SDG 16: Fostering peace and justice and strong institutions; and SDG 17: Partnerships for the goals. By agreeing to SDG targets 14.4 and 14.6, countries aim to "end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices," and "prohibit certain forms of fisheries subsidies that contribute to overcapacity and overfishing and eliminate subsidies that contribute to IUU fishing [by 2020]" (UN General Assembly 2015).

SADC

The Southern African Development Community (SADC) 16 member states have estimated an annual loss of US\$200 million from IUU fishing, with impacts being felt at community levels (Stop Illegal Fishing 2017).⁵ SADC has initiated capacity-building efforts and policies, including the *2008 SADC Statement of Commitment to combat illegal, unreported and unregulated (IUU) fishing* (Stop Illegal Fishing 2017). In collaboration with several countries within the WIO region, SADC is establishing a Regional Fisheries Monitoring Surveillance Coordination Centre (MCSCC) in

⁴ Target 6: By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

⁵ Comprises 16 Member States: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe.

Mozambique to implement the regional MCS strategy for promoting regional cooperation on MCS. FISH-i Africa is a regional Task Force of MCS officers that is being incorporated into the SADC MCSCC. This Task Force has enhanced regional cooperation, coupled with dedicated intelligence, analysis and technical expertise inhibiting illegal catch from getting to market and preventing illegal operators from pursuing their lucrative business. Although some countries within the WIO region have acknowledged the importance of combatting IUU fishing, many will fall short of this goal without an immediate, forceful, and unified effort.

SWIOFC

The South-West Indian Ocean Fisheries Commission (SWIOFC) is a regional fishery body established by the FAO Council to promote the sustainable development, conservation and management of shared resources in its region and serves as a critical platform in its region for any fisheries management issues. Ten out of twelve SWIOFC members are parties to the FAO Port-State Measures Agreement (PSMA), the first binding international agreement to target IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches. The effective implementation of the PSMA in the SWIO region contributes to the long-term conservation and sustainable use of living marine resources and marine ecosystems. Inspired by the PSMA, the Indian Ocean Tuna Commission (IOTC) adopted a resolution on Port State Measures Resolution (IOTC Resolution 10/11, superseded by Resolution 16/11 to Prevent, Deter, and Eliminate IUU Fishing).

The Nairobi Convention

The Nairobi Convention provides the regional framework and platform for the protection and sustainable use of the coastal and marine environment, building capacity, sharing of information and commitment by parties to advance the region's blue economy (United Nations Environment Programme / Nairobi Convention 2020). Regionally, the Nairobi Convention member states have endorsed the FAO Code of Conduct for Responsible Fisheries and have implemented various action plans, including developing national strategies to counter IUU fishing. The Convention offers a solid administrative framework for addressing IUU fishing in artisanal/small-scale fisheries in the WIO due to the existing political mandate for regional marine conservation and fisheries policies and governance.

There are many other foundations and partners supporting efforts to stop IUU at the global and regional levels (Table 1)

Outlook for Regional and Global The need for data and technical solutions to address IUU fishing in WIO artisanal/ small-scale fisheries

Artisanal/small-scale fisheries are an important source of employment and income, supporting an estimated quarter of a million fishers throughout the WIO region (Obura 2017). However, most strategies to overcome the IUU catches focus on large stocks and larger ships in the offshore environment (Widjaja and others., 2019). The Indian Ocean Commission Regional Fisheries and Aquaculture Strategy (2015-2025) states that technical assistance and investments into building coastal fisheries management capacity have been made. However, it acknowledges that addressing IUU fishing and governance within artisanal/small-scale fisheries remains severely under-serviced and poorly regulated due to several factors. These include limited understanding and support, insufficient human resources, and limited investments into sustainable fishery practices (Breuil and Yvergniaux 2014). The lack of conclusive data surrounding the extent and impacts of IUU fishing performed by industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries restricts the ability to address the problem being faced and measure the effectiveness of any anti-IUU fishing actions. Furthermore, the inconsistent implementation of policies, laws, and regulations to counter IUU fishing in the region and the general lack of cohesiveness and consensus amongst the countries and their respective agencies weakens the impact of anti-IUU fishing interventions. The lack of transparency and/or access to electronic data-gathering systems, insufficient information sharing between agencies and countries, general inability to accurately distinguish legal from illegal fish and lack of capacity and resources hamper the ability to react to known IUU fishing threats.

There is an urgent need for information, data analysis and sharing, and collaboration resulting in improved monitoring of small-scale fleets and small-scale fishing behaviour (Anderson 2011). Technology is increasingly being used to track and identify vessels suspected of conducting IUU fishing activities offshore, allowing for targeted enforcement operations against the suspected vessels and the owners of the businesses. Satellite tracking and other cost-effective technologies and

Table 1 Foundations/ Partners Supporting Efforts to Stop IUU Fishing

Foundations/ Partnerships Supporting Efforts to Stop IUU Fishing	
Moore Foundation	The Moore Foundation Environmental Conservation Program balances long-term conservation with sustainable use. They establish models for collaboration that can be replicated and expanded around the globe. And we seek to create lasting change in how land, freshwater and coastal marine ecosystems are managed.
Oceans 5 Alliance	Oceans 5 is an international funders' collaborative comprised of new and experienced philanthropists dedicated to protecting the world's five oceans. They focus their investments on projects and campaigns to establish marine reserves and constrain overfishing.
Oak Foundation	Oak Foundation commits its resources to address global, social, and environmental concern issues, particularly those that have a major impact on the lives of the disadvantaged.
Kingfisher Foundation	The Kingfisher Foundation is a family foundation founded in 1998. Their goal is to restore and preserve the health and resilience of marine fish populations by reducing or eliminating illegal, destructive and economically unviable fishing practices. Kingfisher invests in and promotes innovative ideas and practices to align economic incentives and public policies with sound fishery management and effective conservation.
Blue Nature Alliance	The Blue Nature Alliance is an ambitious global partnership that collaborates with governments, NGOs, Indigenous peoples, and scientists to advance effective large-scale ocean conservation. The Alliance aims to catalyse the conservation of 18 million square kilometres of the ocean over five years.
NGOs Supporting Anti-IUU Initiatives in the WIO	
Wild Oceans	Wild Oceans is working in the WIO region to combat illegal fishing and unsustainable fishing practices. Wild Oceans is well-placed to play a key role in a regional effort bringing strong technical, networking and research skills to the table.
Stop Illegal Fishing	An African-based Not for Profit organisation works closely with governments, civil society, NGOs, intergovernmental with the SADC, supports FISH-i Africa, and coordinates the technical team.
WWF	WWF has facilitated the organisation of local fishing communities and helped build their capacity to combat illegal fishing, create alternative sources of income, and implement environmental education programs.
RARE	RARE addresses coastal overfishing by working directly with community fishers to establish clear rights, strong governance, local leadership, and participatory management to ensure local communities capture benefits from conservation and fisheries management activities.
The Nature Conservancy	TNC works with national governments, regional bodies and the fishing industry in the WIO to address IUU fishing, improve transparency at sea and codify best practices into fisheries management policies.
Technical Companies with IUU Fishing Solutions	
Global Fishing Watch	Has proven success in advancing ocean sustainability and stewardship by using technology to visualise, track and share data about global fishing activity in near real-time at no cost.
Trygg Matt Tracking	Trygg Matt Tracking is a Fish-i Africa technical team member by providing its fisheries intelligence analysis and vessel tracking to national authorities and relevant international institutions supporting anti-IUU fishing operations.
Sea Shepherd	Has assisted in countering IUU fishing in most oceans of the world. They have recently partnered with African governments, including Gabon, to effectively address IUU fishing within African waters.
Allen Institute for AI (AI2)	With the Skylight Alerting platform, AI2 has focused its anti-IUU efforts offshore. Combining Skylight with their EarthRanger protected area platform, AI2 will have the ability to track and monitor industrial foreign-driven vessels both near- and offshore. This will enable MPA/LMMA managers and fisheries officers to make informed decisions on artisanal vessel activities by combining and analysing real-time data from remote imaging, through sensors and from information from observations.

tools exist through Global Fishing Watch, OceanMind, Trygg Matt Tracking, and Skylight. In parallel, there has been experimentation with onboard cameras and other remote observation tools by fisheries inspectors and enforcement officers that have increased the success of operations. The use of technology for near-shore artisanal fishing has seen limited success since many vessels don't possess Automatic Identification System (AIS) and Vessel Monitoring System (VMS) technology. Port inspections, stronger regulations, awareness workshops, technical advancements and, to some extent, satellite imagery are being used in an attempt to address this.

This paper calls for a regional plan of action to better understand and address IUU fishing by both small-scale fishers and industrial fishing vessels occurring within artisanal/small-scale fisheries of the WIO region, with a particular emphasis on programs to improve information, raise awareness, and devise strategies to curb those illegal activities. There is an urgent need for collective regional effort (in the form of long-term support to national Governments) prioritising research, information sharing, capacity building, and strengthening Monitoring Control & Surveillance (MCS) systems. An integrated and participatory approach to sustainable development and management of small-scale fisheries involving all stakeholders (resource users, academia, civil society, and Governments) is recommended.

Policy Recommendations for member states of the Nairobi Convention

- Achieve recognition and agreement by the Parties to the Nairobi Convention that IUU fishing conducted by both industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries is a pervasive threat. The threat goes beyond sustainable management of ocean and coastal resources and poses a significant risk to the region's economic development and social welfare.
- Achieve recognition and agreement by the Parties to the Nairobi Convention that IUU fishing risks the achievement of SDGs and blue economy initiatives at both a country and regional level, endangering food security, sustainable livelihoods, and social protections.
- Develop a WIO regional plan of action by the Parties to the Nairobi Convention to address IUU fishing performed by industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries and unlock the full potential of the

blue economy in alignment with and in support of other regional efforts.

The plan will include:

1. assistance and support to national Governments to elaborate legislation and regulations for small-scale fisheries;
2. improving research and information gathering to create awareness and sensitisation of fishing community and policymakers on biodiversity and the sustainability of resources; and
3. strengthening local fisheries organisations and institutions for community-based and/or participatory management, co-management, and improving MCS in small-scale fisheries.

Technical Recommendations

- Conduct a WIO regional threat assessment focusing on IUU fishing practices by both industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries. Without first understanding the extent of the threat in the region, IUU fishing will continue to impact the ability to deliver on blue economy initiatives and achievement of the SDGs by countries within the WIO and the region at large. The threat assessment will include:
 4. the full scope of IUU fishing conducted by both industrial fishing vessels and small-scale fishers within artisanal/small-scale fisheries;
 5. the extent of the threat of IUU fishing to coastal resources and the broader impacts on the blue economy, which links to SDGs, food security, poverty, etc;
 6. how IUU fishing impacts the ability of LMMAs and MPAs to function effectively both from a conservation and blue economies perspective; and
 7. opportunities where technology can enhance collection, dissemination, and analysis of information to promote active management, real-time situational awareness, and improved business information systems to inform management decision-making.
- Mobilise actors' networks and establish a regional inter-sectoral IUU fishing expert panel. The political will to address IUU fishing is still constrained by limited knowledge and consensus mechanisms in the region. There is a need to establish a regional inter-sectoral expert panel on IUU fishing threats and solutions to facilitate sustainable ocean-based economic, social, and environmental benefits and share strategies that

are part of or aligned to the SADC efforts. The panel may include academia, government, policymakers, industry and traditional and indigenous knowledge holders.

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