

Illegal, Unreported and Unregulated (IUU) Fishing: Impacts, Hotspots and Policy Responses

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1. Introduction

Illegal, Unreported and Unregulated (IUU) fishing is one of the biggest risks to the protection of marine biodiversity and sustainable fisheries management. Undermining regional and national efforts to manage fisheries fairly and sustainably, IUU fishing poses serious dangers to the economy, society and environment (FAO, 2020). IUU fishing is defined widely by the Food and Agriculture Organization (FAO) to include operations that are not reported or are misreported, take place in regions with insufficient regulation, or violate national, regional, or international fishing rules (FAO, 2020).

The FAO (2001) classifies IUU fishing into three categories:

- **Illegal fishing** involves activities conducted by national or foreign vessels in contravention of applicable laws and regulations.
- **Unreported fishing** refers to fishing activities that have not been reported or have been misreported to the relevant authority.
- **Unregulated fishing** includes fishing in areas where no conservation or management measures exist or by vessels that are not under the jurisdiction of any state.

2. Economic Impacts

According to Agnew et al. (2009), IUU fishing causes losses of between US\$10 billion to \$23.5 billion a year, or 11–26 million tonnes of fish. Due to their limited enforcement capabilities, developing nations—especially those in West Africa and Southeast Asia—are disproportionately impacted. Due to decreased revenue and increased competition from illegally obtained fish in marketplaces, these losses have a direct effect on licensed fishermen (Sumaila et al., 2006).

3. Social and Food Security Implications

In coastal areas, IUU fishing threatens food security and livelihoods. Due to the expansion of industrial IUU fleets, artisanal fishermen in areas such as the Western Indian

Ocean are confronted with the loss of local fisheries (EJF, 2018). This has the potential to worsen poverty, increase migration and fuel maritime insecurity, which includes piracy (Burgess et al., 2018).

4. Environmental Consequences

Overfishing and the devastation of marine ecosystems are two environmental consequences of IUU fishing. While bycatch of non-target species, including as sharks, turtles and marine mammals, further affects biodiversity, practices such bottom trawling harm benthic habitats (Pauly et al., 2005). Additionally, stock assessments and conservation efforts are hampered by the absence of data from unreported and unregulated fishing.

5. Geographic Hotspots

Although it is not evenly distributed, IUU fishing is more common in areas with poor governance, little enforcement and great economic vulnerability. West Africa, Southeast Asia, the South Pacific and portions of Latin America are among the areas most impacted. The Gulf of Guinea is especially well-known for having high levels of IUU fishing in West Africa. Foreign industrial vessels operating illegally in their exclusive economic zones (EEZs) cause enormous losses for nations like Senegal, Guinea and Sierra Leone. According to studies, IUU fishing costs West Africa about USD 1.3 billion a year (Doubouya et al., 2017). Widespread corruption, a lack of openness in the distribution of fishing licenses and inadequate resources for surveillance are all contributing issues (Agnew et al., 2009).

Another hotspot for IUU practices is Southeast Asia, where fleet movement, overcapacity and a lack of cross-border collaboration are all factors. In the Philippines and Indonesia, large-scale operations avoid limits and fish in protected areas, while small-scale fisheries are frequently underreported because of unofficial market arrangements. In addition, a lot of Southeast Asian nations serve as flag states for boats involved in IUU fishing in faraway waters (Sumaila et al., 2020). The lack of adequate marine surveillance capabilities presents difficulties for the South Pacific, especially for areas governed by small island developing states (SIDS). Stocks of shared tuna are depleted by illegal fishing in high seas regions that are contiguous to these EEZs. According to the Pacific Islands Forum Fisheries Agency (FFA), up to 34% of tuna fishing in the Western and Central Pacific may go unreported or be prohibited, according to 2016 research (FFA, 2016).

6. Monitoring and Enforcement Measures

Technological developments have transformed fishing activity monitoring, providing instruments that help governments and international organizations identify and discourage

illicit, unreported and unregulated fishing. Many regional fisheries management organizations (RFMOs) require the use of satellite-based tracking devices called vessel monitoring systems (VMS). Regulatory agencies can confirm adherence to fishing laws by using the location data of registered fishing vessels that VMS provides in almost real-time (FAO, 2020).

Originally created for maritime safety, Automatic Identification Systems (AIS) are now frequently employed to keep an eye on fishing activity. AIS can assist in locating "dark fleets," which are IUU operators' typical tactic of turning off their transponders to evade detection (McCauley et al., 2016). The introduction of satellite-based surveillance and remote sensing, particularly Global Fishing Watch, has greatly increased transparency. Maps of fishing activity throughout the world are made publicly available by Global Fishing Watch using radar imagery, AIS data and machine learning. Governments and NGOs are using this technique more frequently to enforce fishing prohibitions in marine protected areas and identify suspicious activity (Kroodsma et al., 2018).

The implementation of Port State Measures is essential to enhancing these technologies. Targeting IUU fishing explicitly, the first legally binding international pact is the Port State Measures pact (PSMA). It requires parties to prevent unlawfully captured fish from entering global supply chains by denying port access and services to vessels suspected of participating in IUU fishing (FAO, 2016).

7. Policy and Governance

In order to effectively address IUU fishing, effective governance is essential. Establishing thorough legal frameworks, upholding rules and encouraging global collaboration are all part of it. Governments at the national level must fortify their institutional and legal foundations. In order to do this, IUU fishing must be made illegal, severe fines must be applied and the legal system must be strengthened to prosecute violators (FAO, 2020). In order to coordinate conservation efforts across international waters, Regional Fisheries Management Organizations (RFMOs) are essential. These organizations set closed seasons, bycatch limitations and quotas. They also put monitoring and compliance procedures in place. According to Lodge et al. (2007), political disputes and unequal commitment among member nations, however, frequently impede the efficacy of RFMO.

Additionally, market-based tools are essential. Programs for seafood traceability and Catch Documentation Schemes (CDS) guarantee that only fish that have been legally captured make it to customers. For instance, the IUU Regulation of the European Union mandates that all seafood imports be certified as coming from a legal source, using market access as a means

of encouraging compliance (European Commission, 2021). Co-management and community-based governance models are also becoming more popular. These entail enabling local communities to manage resources, conduct surveillance and report. Significant improvements in compliance rates and conservation outcomes occur when local stakeholders own marine resources (Cinner et al., 2012).

9. Technological and Monitoring Innovations

Technological developments have enhanced IUU fishing surveillance and detection. Real-time detection of suspicious activity is facilitated by tools such as automated identification systems (AIS) and Global Fishing Watch, which tracks vessel movements using satellite data (Kroodsma et al., 2018). These resources improve openness and help law enforcement focus their efforts.

10. Recommendations and Conclusion

To effectively combat IUU fishing, a multi-pronged strategy is necessary:

- Strengthen regional cooperation and capacity-building.
- Promote transparency and public access to fishing data.
- Incentivize legal fishing practices through market-based mechanisms.
- Enhance monitoring, control and surveillance systems.

The transboundary problem of IUU fishing necessitates coordinated international responses. Despite advancements, there are still large gaps in data collecting, administration and enforcement. For maritime resources to be used sustainably, these gaps must be filled.

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