SOCIO-ECONOMIC AND INSTITUTIONAL DRIVERS OF ILLEGAL FISHING IN UGANDA

RESEARCH PAPER 2024

PREPARED

BY

FEDERATION OF FISHERIES ORGANIZATIONS UGANDA
(FFOU)
Plot 20, Jinja Road, 2nd Floor Wabyona Plaza, P.O Box 3116 Kampala - Uganda.
Tel: +256414583081, +256701158174, +256774158174
Email: info@ffou.org, Website: www.ffou.org

The fisheries sector in Uganda is a vital component of the national economy, contributing approximately 3% to the national Gross Domestic Product (GDP) and providing a primary source of animal protein for millions. However, the sustainability of this sector is severely threatened by the proliferation of illegal, unreported, and unregulated (IUU) fishing. The Federation of Fisheries Organizations Uganda (FFOU), acting as an umbrella body for various stakeholders, has identified that the drivers of illegal fishing are multifaceted, ranging from socio-economic desperation to institutional gaps in enforcement.

Research conducted by the FFOU and various academic scholars indicates that the primary motivation for illegal fishing in Uganda is economic survival. In the monograph *Fisheries Management in Africa*, it is noted that as human populations around Lake Victoria and Lake Kyoga have surged, the competition for dwindling resources has intensified. This "race for fish" leads fishers to adopt prohibited gears, such as monofilament nets and undersized mesh, to maintain catch volumes.

The specific reasons for the persistence of these practices include:

1. **High Poverty Levels:** Many artisanal fishers lack the capital to purchase legal, high-quality gear. Illegal nets are often cheaper and more readily available in informal markets and also Lack of alternative sources of income makes fishers over dependent on fishing as the only economic activity on the water bodies.
2. **Market Demand for Immature Fish:** There is a significant regional market, particularly in neighboring Democratic Republic of Congo and South Sudan, for small, salted, or sun-dried immature fish, which incentivizes the use of small-mesh nets.
3. **Weak Governance within the fishing sector and Corruption:** Historically, the monitoring, control, and surveillance (MCS) systems have been undermined by limited funding and reports of rent-seeking behavior among enforcement officers.
4. **Open Access Nature:** Despite licensing requirements, many of Uganda's water bodies function as de facto open-access resources, where the lack of clear property rights leads to the "Tragedy of the Commons."

Technological Interventions

To curb these activities, FFOU, in collaboration with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and UPDF Marine, can leverage Information and Communication Technology (ICT) to modernize surveillance and traceability. As highlighted in the *World Bank ICT in Agriculture Sourcebook*, technology can bridge the gap between remote fishing communities and central regulatory authorities.

1. Vessel Monitoring Systems (VMS) and GPS Tracking

The implementation of small-scale VMS using cellular or satellite-based GPS can allow UPDF Marine to monitor the movement of boats. By establishing "geofences" around protected breeding grounds, authorities can receive real-time alerts when a vessel enters a restricted area. This reduces the cost of physical patrols by allowing for targeted enforcement.

2. Digital Licensing and E-Registry

Moving away from paper-based systems to a centralized digital registry of all fishers and vessels is crucial. Using biometric identification or smart cards to ensure that only registered fisher have access to landing sites. This data can be integrated into a mobile application where enforcement officers can instantly verify the legality of a fisher’s operations.

3. Blockchain for Traceability

To eliminate the market for illegal fish, blockchain technology can be used to create a "catch-to-table" digital trail. By tagging legal catches at the landing site with QR codes to ensure that only sustainably harvested fish enter the formal supply chain. This empowers consumers and exporters to reject products derived from IUU fishing.

4. Mobile-Based Reporting and Crowdsourcing

The UPDF Marine and MAAIF can utilize "m-government" solutions to empower local fishing communities. A dedicated SMS or app-based platform allows law-abiding fishers to anonymously report illegal activities (whistleblowing). This community-based monitoring leverages the high penetration of mobile phones in rural Uganda to create a "virtual watch" over the lakes.

5. Remote Sensing and Drone Surveillance

For large expanses like Lake Victoria, satellite imagery and Unmanned Aerial Vehicles (UAVs) provide a cost-effective way to detect illegal night fishing. Synthetic Aperture Radar (SAR) can detect boat lights and metallic hulls even through cloud cover, providing the UPDF Marine with actionable intelligence on where illegal fleets are congregating.

Mathematical Modeling of Harvest Sustainability

To demonstrate the impact of illegal fishing to stakeholders, FFOU can utilize bio-economic models. The Gordon-Schaefer model is often used to illustrate the relationship between fishing effort (E) and sustainable yield (Y): $Y=rB(1-BK)$ Where:

- r is the intrinsic growth rate of the fish stock.
- B is the current biomass.
- K is the carrying capacity of the lake.

Illegal fishing often pushes the effort E beyond the Maximum Sustainable Yield (MSY), leading to a collapse of the biomass B. Technological interventions aim to regulate E to ensure that B remains at a level where the population can regenerate.

In summary

Curbing illegal fishing in Uganda requires combined efforts and a transition from reactive physical enforcement to proactive, data-driven management. By adopting VMS, digital registries, and community-led mobile reporting, FFOU can protect the livelihoods of legitimate fishers while ensuring the ecological integrity of Uganda's aquatic resources.

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