Illegal, unreported, and unregulated (IUU) fishing is a global problem, comprising an estimated 20% of fish catch globally and creating economic losses estimated between US$25.5 - $49.5 billion[1]. In the Indian Ocean, the scale of the problem was highlighted in a recent report by Trygg Mat Tracking and Global Fishing Watch detailing foreign vessel incursions likely targeting tunas[2]. However, to date, there is no basin-wide estimate of illegal fishing for the Indian Ocean, and the last broad scale estimates are based on a global study which uses data from the early 2000's[3]. Key information necessary for effective interventions is lacking, and many estimates of illegal fishing are based on methodologies that are prohibitively labour intensive or costly, hampering efforts to measure changes against a baseline and assess progress.

CSIRO intends to use a low-cost, transparent, and repeatable approach to estimate illegal fishing at the regional level in the Indian Ocean Basin. The project is fully funded by Australia's Department of Foreign Affairs and Trade. Although there will be no focus on flag state or national waters (to reduce the sensitivity), finer-scale estimates (e.g., national) can also be provided upon request. The project consists of three components: surveys, an assessment of public documents and interviews with regional experts.

1. **Surveys**

Two surveys will be used to collect data on illegal fishing in the Indian Ocean.

The **first survey** will be disseminated to **fisheries officers** in all countries adjacent to the Indian Ocean and contains three main components:

- The first component of the survey focuses on 30 priority species of the Indian Ocean which largely live in countries' Exclusive Economic Zones (EEZs). This will allow us to develop a semi-quantitative estimate of illegal landings for these species based on the expert opinion of fisheries officers.
- Second, the survey contains a map on which participants can locate illegal fishing hotspots across the Indian Ocean.
- Third, the survey focuses on four priority species for five subareas of the Indian Ocean (see Figure 1). For those four species we will be able to provide a more detailed characterization of illegal fishing activities, such as gear types and organizational structures.

The **second survey** will be disseminated to **fisheries observers** active on the high seas of the Indian Ocean, provided to them via key contacts in the following four Regional Fisheries Management Organizations (RFMOs): CCAMLR, IOTC, CCSBT and SIOFA. Like the first, this survey contains three key components:

- The first component of the survey focuses on 30 priority species managed by the four RFMOs. This will allow us to develop a semi-quantitative estimate of illegal landings for these species based on the expert opinion of fisheries observers.
- Second, the survey contains a map on which participants can locate illegal fishing hotspots across the high seas of the Indian Ocean.
- Third, the survey contains questions to obtain a detailed characterization of illegal fishing activities on the high seas, such as gear types and reefer/bunker activities.

[1]Sumaila UR, Zeller D, Hood L, Palomares MLD, Li Y, Pauly D. Illicit trade in marine fish catch and its effects on ecosystems and people worldwide. Sci Adv. 2020;6(9):1–8.

[2]Trygg Mat Tracking & Global Fishing Watch. Fisheries intelligence report. 2020. Available at: https://globalfishingwatch.org/wp-content/uploads/GFW-TMT-2020.pdf

[3]Agnew DJ, Pearce J, Pramod G, Peatman T, Watson R, John R, et al. Estimating the Worldwide Extent of Illegal Fishing. PLoS One. 2009;4(2).

Both surveys are disseminated via the online survey platform QuestionPro and can be made available in most primary national languages. They both take about 30 minutes to complete and are completely confidential: no information on the respondent is requested or stored. The surveys can be delivered either individually or in a workshop setting. CSIRO can provide a local facilitator to support the workshop, if that is appropriate. CSIRO staff can support fisheries officers and fisheries observers in accessing and completing the survey via video conference.

2. Assessment of public documents

The second section of the project will involve compilation and assessment of illegal fishing incidents from publicly available documents. A machine learning approach will be used, and analysis of the documents will provide an independent source of information on nature and location of illegal fishing activities, volume of catches, species caught, vessel flags and crew nationality.

3. Interviews with key informants

The third section of the project will involve interviews with key informants. Such experts may include: consultants active in fisheries management, industry representatives, and others knowledgeable on Indian Ocean fisheries. The semi-structured interviews will not only provide further information regarding the locations and nature of illegal fishing in the region, but also offer insights into opportunities for reform.

Foreseen outcomes of the project

We foresee several outcomes from this project of high relevance to coastal countries. The project will provide an estimate of the volume and value of illegal fishing in the Indian Ocean basin for 30 priority neritic species and 30 priority high seas species. A characterization of illegal fishing activities will also be provided, including details on gear, violation types, and infrastructure used. The project will also highlight areas that are thought to be hotspots for illegal catches, both within EEZs and the high seas, and review policy challenges and successes across the basin. These outcomes can inform policies and practices designed to combat illegal fishing in the region, and the methodology can be used to track illegal fishing in the future.

For information, a similar project has recently been completed by CSIRO and FAO for the Asia Pacific Fisheries Commission. The report is available from the FAO publications repository. The survey component of the methods has also been used to make national estimates for 20 species across 16 regions in Chile in cooperation with the national fisheries agency, with the outcomes recently published in the scientific literature. Chile now uses the methodology as a Key Performance Indicator (KPI). If countries or regional organizations are interested, the project team will provide a customized report specific for the country or region, upon request at no cost.

Recommendations

That the CoC19:

1) NOTE the information provided in document IOTC–2022–CoC19–07c,
2) ENDORSE the IOTC Secretariat to share the survey designed for observers active on the high seas of the Indian Ocean with the observers of the IOTC Regional Observer Scheme, and for CPCs to encourage their observers and other IOTC observers to cooperate with the initiative.