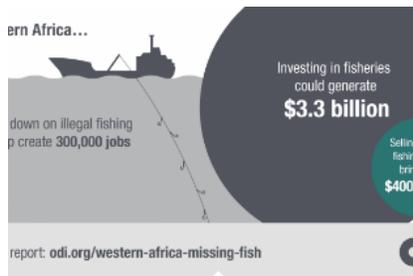## Illegal, unreported, and unregulated fishing and unsustainable behaviour of Distant Water Fishing Fleets by ODI (formerly Overseas Development Institute)

This project will address a fundamental data gap related to distant water fishing (DWF) using technical approach that combines an innovative use of ensemble algorithms, geographic information systems, and data analysis:

- Ensemble algorithms: Ensemble learning is a meta-approach to machine learning that seeks to better predictive performance by combining the predictions from multiple models. We use an ensemble of learning algorithms to identify where and how vessels operate when fishing. To train the algorithms, based on expert knowledge, fishing manoeuvres are first labelled so that the algorithms can detect patterns in the location data.

- GIS: A geographic information system (GIS) is used to visualise automatic identification system (AIS) data and identify fishing manoeuvres according to their location and movement patterns.

- Data analysis: Using the local experts in fisheries, expert literature, and the FishSpektrum Krakken data registry (the largest database of fishing vessels in the world) to create a relational database that integrates algorithmic computing and GIS maps to answer the IUU fishing related questions.

The project started in July 2022 and is planned to be completed by end of May 2024.

Current status and achievements	• Two inception workshops covering two regions of focus (one for Latin America and one for Africa and the Philippines) have been held in August 2022 to present the work plan and ensure local stakeholders engagement in the project implementation. • An extra internal workshop took place on 26-30 September with the research and data teams to kick off the project. • Raw data files have been acquired from Krakken and Orbcomm sources for the study areas. • Developed a technical report on the composite and analysed datasets.
Target outputs and outcomes by end of project	• Fundamental gaps in the literature on DWF fishing and unsustainable fishing are filled with knowledge created on the EEZs and surrounding waters of Senegal, Ghana, Peru, Ecuador, and the Philippines. • Policymakers are supported with evidence and analysis of fishing activities in the targeted EEZs and surrounding countries to take actions at international, regional, and national levels to reduce IUU fishing and overfishing. • Updated estimates and cross-regional/country comparisons of IUU fishing are produced and openly accessible using a standardised methodology to generate across-the-board figures of volumes and values for IUU fish catches and to determine patterns and dissimilarities in types of fishing and manoeuvres, predominant flags, fleets, and owner/operators, specific areas of intense fishing

operations and types, DWF volumes in terms of the number of vessels, and IUU activity.

This project will address a fundamental data gap related to distant water fishing (DWF) through: a) visualise, define, and investigate the scale, form, and behaviour of the international and national DWF fleets operating within the Exclusive Economic Zones (EEZs) and surrounding waters of each country; b) study and comparison of IUU fishing and unsustainable behaviour of DWF fleets in these EEZs to identify patterns and commonalities, as well as concrete vessels (including the companies behind them); and c) estimate the economic losses derived from this activity to build a business case for policy and enforcement reform.

ODI designed the project to be sustainable after the OIC contribution. The project methodology and algorithms will be made openly available so that other interested parties and stakeholders can continue to track the changes and developments in DWF and IUU fishing into the future. By working with in-country stakeholders, the project will contribute to building capacity in the communities most affected by DWF and unsustainable fishing within the selected countries by assisting them to understand, interpret and use the data. Finally, by filling data gaps and producing fundamental analysis on DWF in EEZs, the project will strengthen the regulatory environments in which these practices happen and the enforcement efforts to stop IUU fishing and unsustainable fishing practices. The project findings will also be disseminated widely through UNDP and ODI's extensive and well-developed channels for engagement and communication with policymakers, thought leaders, local and international non-governmental organisations, and international actors.