

## Characterizing transshipment at-sea activities by longline and purse seine fisheries in response to recent policy changes in Indonesia

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### ABSTRACT

Fishing activities are important for food resources and economics globally, with more than 120 million people depending on fishing for their livelihood. Fisheries management, and the related crackdown on illegal fishing has been rapidly evolving in the last several years, particularly in Indonesian waters. This is critically important because of the significant fisheries resources within the region (estimated at more than \$2 billion USD per year). The changes in regulations, including a moratorium on foreign vessels and on transshipment by foreign vessels, as well as changes in legislation related to domestic vessel activities means that Indonesia is in the limelight on addressing illegal, unreported and unregulated (IUU) fishing activities. An expert group identified key behaviours by vessel operators that indicate violations of these regulations, in particular the regulations on foreign and domestic transshipment. In this paper the transshipment indicators in purse seine and long line vessels developed in the workshop are characterised, governance changes are discussed, and the perverse consequences and impacts of new policies that have recently been implemented are highlighted.

### 1. Introduction

Human food resources have become global commodities. Approximately 23% of food consumed worldwide now moves through global supply chains [1]. Global seafood flows are estimated to be approximately 28 million tonnes worth an estimated \$131.6 billion USD [2], forming 10% of all food trade, and 1% of overall global trade [3]. While the number of countries involved in seafood trade has remained constant over the last 20 years, the number of partnerships has increased by 65%, the quantity by 58%, and the value by 85% in real terms [2]. China and Thailand have emerged as major new players in global seafood trade over this period, and increasing exports from Asia and South America [2] have been observed. For some countries these exports form a major portion of their economies, reaching up to 40% of the value of traded commodities [3]. Given the potential impact of maritime activities on marine resources, in 1995 the Food and Agricultural Organization (FAO) developed a code of conduct to establish international standards for behaviour and responsible fishing (and other maritime) activities. The goal was to ensure the appropriate conservation and management of living aquatic resources [4].

Transshipment, or the exchange of goods between alternative modes of transport, has become an increasingly important component of

fisheries supply chains, occurring either in port or at-sea. Defined by the Food and Agriculture Organization (FAO) as the “act of transferring the catch from one fishing vessel to either another fishing vessel or to a vessel used solely for the carriage of cargo” [5], transshipment has been believed to be one activity that can improve cost efficiency for fisheries.

Transshipment allows fishing vessels to specialize on production, increasing their efficiency and decreasing fuel costs associated with moving fish products to market. For instance, as China's fishing fleet expanded from a primarily domestic operation to a global footprint, the industry moved to utilizing specialized catching vessels, operating with transshipment vessels that moved catch [6]. This foreign expansion has been estimated at 4.6 million tonnes per year, with 3.1 of that coming from the waters of African countries [6].

However, transshipment is linked to a number of serious issues. Lack of transparent reporting of catches is a serious issue. For instance, only between 25% and 50% of the current foreign Chinese catch is reported [6]. This lack of reporting is linked to transshipment, which makes catch documentation difficult, and forces managers to reconstruct catches indirectly [7].

Transshipment also opens market access, with potentially major impacts on harvesting rates and sustainability. Market access has a strong effect on fisheries and their outcomes in terms of sustainability.

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Market access can lead to depletion for vulnerable species at the local scale, as has been found in the Solomon Islands [8] or globally where local markets were < 14 km away [9]. International flows of fish extend this impact significantly. For instance, in 2003 it was estimated that people in Hong Kong consumed between 130,000 and 290,000 t of reef fish per year, supported by imports across Southeast Asia. These imports exceeded Southeast Asia's production capacity by six times [10].

Transshipment has also been implicated in illegal fishing, where it is estimated to account for between US \$10 and \$23.5 billion worth of catch annually [11]. Transshipment allows fishing companies to exploit legal loopholes in fisheries regulations and to reduce costs (e.g. [7]). Illegal fishing involving transshipment is often linked to other crimes, including money laundering, transport of drugs, and human trafficking [12,13]. Use of transshipment vessels facilitates these illicit activities, making them more difficult to detect by intermingling illicit activities with otherwise lawful catch and commercial activities [13]. As an indication of its importance, transshipment has been recognized by the United Nations Food and Agriculture Organization's International Plan of Action as a key target for intervention to reduce IUU fishing [14]. The International Plan of Action to prevent, deter and eliminate IUU fishing (IPOA-IUU Fishing) was formed in 2001 under the auspices of the United Nations Food and Agriculture Organization's Code for the Conduct of Responsible Fisheries [4]. This International Plan was followed by the first Regional Plan of Action (RPOA-IUU Fishing) in 2007, which covered the shared waters of 11 countries in the Indonesian region ([15]; <http://www.rpoaiuu.org/joint-ministerial-statement/>). In 2012, Indonesia formulated a National Plan of Action to Prevent and Combat IUU Fishing 2012–2016 [15].

IUU fishing results in significant economic losses for Indonesia [16], estimated at a minimum of \$2 billion USD each year [17]. In addition, IUU fishing threatens the sustainability of fish resources, increases habitat degradation and endangers the livelihoods of small scale fishers. Significant efforts have been made by the Indonesian government to reduce IUU fishing in national waters [18].

Some of the more recent efforts to reduce IUU fishing include a six-month moratorium on issuing new fishing licences within Indonesian Fisheries Management Areas (IFMAs) enacted in 2014 (56/2014) and a ban on transshipment at-sea (also enacted in 2014 (57/2014)). To further reduce IUU fishing, changes to the legal catch size of lobsters and crabs was implemented in 2015 (01/2015) and a complete a ban on all trawl fishing activities in the IFMA was decreed in 2015 (02/2015). Finally, also in 2015, Indonesia developed a special task force to combat IUU.

### 1.1. Transshipment in longline and purse seine fisheries in Indonesia

The Ministry of Marine Affairs and Fisheries of Indonesia (hereafter referred to as MMAF), through the Ministerial Regulation No. 30/2012 article 1 on Fishing Business within Indonesia's Fisheries Management Areas (FMAs), uses a definition of transshipment similar to that of the UN FAO. Transshipment was a common practice in tuna longline and purse seine fisheries in Indonesia until it was banned by the Indonesian government in 2014. Enforcement of this ban has remained a significant challenge, in part due to the difficulty in detecting and monitoring transshipment activities at-sea. In particular, there is a lack of direct fisheries officials on vessels to observe activities and there is incomplete coverage of vessels by global position system (GPS) tracking systems. Hence, it is essential to develop indicators that can be used to infer transshipment events from vessel tracking data that is currently available. To date, there has been no synthesis of indicators of transshipment at-sea practices in Indonesian waters. Herein, an overview of transshipment at-sea events is provided, current regulations that specifically address transshipment are discussed, and a suite of indicators for longline and purse seine fisheries in Indonesian waters as a useful tool to underpin monitoring, control and surveillance activities to reduce

IUU are presented.

## 2. Methods

General patterns of transshipment by longline and purse seine vessels operating in the Indonesian waters were determined through reviewing the existing literature. This was followed by a series of focus group discussions (FGD). These discussions involved fisheries and statistical modelling experts (national and international), scientists, fisheries managers from the Directorate General for Capture Fisheries and Surveillance Division under MMAF. Discussions also included fishing association members (Indonesian Tuna Longline Association) who were gathered to develop a common understanding on characteristics of transshipment events, based on their knowledge and experience in a professional capacity. The process resulted in a list of potential indicators for transshipment activities, which fell into two categories: quantitative indicators and qualitative indicators (see [Supplementary materials, Table 1](#)). After the first discussion, three subsequent workshops took place in which participants clarified and added information. Workshops were attended by nominated staff of various agencies and stakeholder groups (most of whom who had previously provided input).

## 3. Results and discussion

### 3.1. National and sub-national regulations on transshipment

The *maritime axis* policy from Indonesia's president was put forward by the MMAF minister in late 2014. Eliminating IUU fishing practices is one of the main issues addressed by the minister with various measures and regulations identified as sources of IUU practices seeding from the previous failed policy. Essential regulations included ministerial regulations number. 56/PERMEN-KP/2014 concerning a moratorium on foreign built vessels in November 2014 and number 57/PERMEN-KP/2014 concerning a transshipment ban in December 2014 (Fig. 1). Also important was regulation 2/PERMEN-KP/2015 on the prohibition of trawl and trawl like gears operation in Indonesian waters in January 2015 (Fig. 1).

### 3.2. Response to implementation of regulations

Transshipment was common practice in Indonesia prior to November 2014, stemming from efforts to increase fishing efficiency and decrease

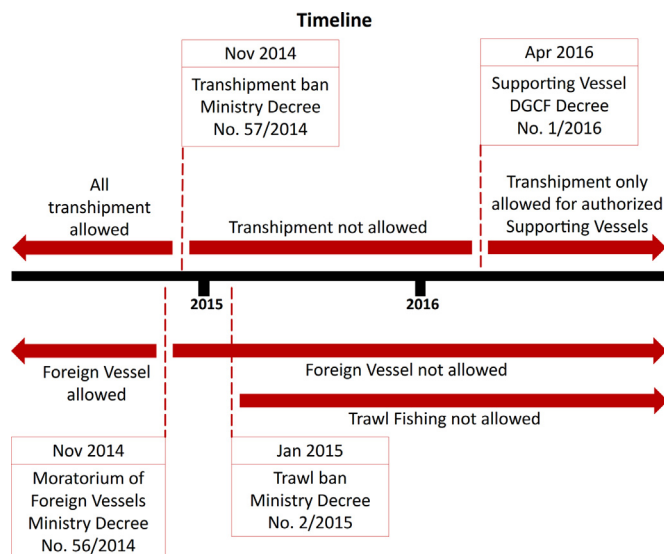


Fig. 1. Timeline of and regulations related to transshipment developed by the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia.

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