Yayasan
Masyarakat dan Perikanan
Indonesia

Harnessing market forces for small-scale fisheries: A guideline document based on experiences in small-scale tuna fisheries of Indonesia

2017

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1. Introduction

1.1. Global demand for seafood

The global demand for seafood is increasing, placing pressure on fish stocks to provide for an ever increasing human population. Meanwhile, many fish stocks are experiencing overfishing and fishing pressure on these stocks needs to be alleviated to prevent further overfishing and to prevent high seafood prices generated from scarcity of wild fish species (Tveteras *et al.*, 2012). The large consumer markets of the EU, US and China now rely heavily on imports as fish stocks in their waters have declined and as the demand for more tropical species, such as tuna, has increased. China is currently the largest consumer of seafood products, with an increasing number of products imported (Villasante *et al.*, 2013). The US imports up to 90% of seafood products by weight (Helvey *et al.*, 2017) and almost 20% of food imports to the EU in 2015 were seafood products, worth an estimated 22.3 billion Euros (EUMOFA, 2016). In each case, a large proportion of the imported products originates from developing country fisheries, with products such as tuna, swordfish and shrimp in high demand as consumer preferences change (Helvey *et al.*, 2017).

1.2. Market forces as an alternative to regulations

International and national regulations are established to either limit, control and regulate fishing effort. However, these regulations are dependent on adequate enforcement and monitoring and the will of national government to agree and implement regulations. Another approach for generating change in the fishing industry is through the market, through consumers' buying power. These market-based initiatives differ from command-and-control regulations (Litz, 1994; Stavins, 1995), which place restrictions on fishing effort, use punishments to deter non-compliance and can have high enforcement costs. The concept of market initiatives is to disrupt the status quo of consumer behaviour and supply and demand systems. In this way market initiatives can be thought of as 'forces', causing change in the market place. Market forces are generally described as

> *forces that can affect price and demand for a product, are independent from government influence, differ from market-based policies and tend to originate from the combined behaviour of consumers and sellers (Business Dictionary, 2017; Cambridge Dictionary, 2017).*

Market forces can be certification schemes, high-profile campaigns or fish guides. One example of a very successful campaign is the appearance of an ex-basketball star in a campaign against the consumption of shark fin in China, contributing to a decline in shark fin consumption (Fabinyi, 2016). The Monterey Bay has fish guide called the Seafood Watch program, providing recommendations for consumers on what fish to consume and why (Monterey Bay, 2017) As such, market forces incentivise better or more desirable and sustainable practices through the reward of market access, potentially better price and consumer choice (Roheim *et al.*, 2011). The concept of harnessing market forces for environmental or other protection is not a new concept, emerging in the 1980s. The main reasons for turning to market-based initiatives as more favourable / successful methods were identified by Stavins (1995):

- Cost effectiveness is a priority in policies, meaning not everything can be included

- The burden of regulations on industry stakeholders
- The emergence of new types of environmental problems that cannot be adequately addressed with status quo policies

Consumer demand for a particular species can affect the health of that fish stock, experiencing increasing fishing pressure as the fish becomes fashionable for health benefits or other attributes. For example, demand for monkfish in the UK increased after promotion by high profile chefs in the 1980s, after which fishing pressure on these stocks increased causing the stocks to decline rapidly (Pinnegar *et al.*, 2006). Therefore, the choices consumers make on what fish products to purchase affects the fishing pressure exerted on a stock and consequently the state of stock. If consumer behaviour can be changed, switching from overfished products to non-overfished products, there is the potential to reduce demand for and therefore pressure on some endangered and overfished stocks and also to reduce demand for fish caught with certain gears (i.e. those with known high volumes of bycatch). This means that a fishery's investment in more sustainable practices can give it a competitive edge in the market. However, given the array of fish products available to consumers, it is often difficult to distinguish between sustainably and non-sustainably sourced fish. Providing this information in an easily-accessible manner to consumers is the basic concept behind market certifications.

1.3. Certification schemes, consumer power and retailers

Certification schemes originated from consumers demanding to know the quality and safety of their food products (Beulens *et al.*, 2005) but have since evolved to certify any number of issues of interest, from dolphin-safe to organic and low discards (Ecolabel Index, 2017). Consumer awareness of the decline in many fish stocks globally and the effects of fishing on the ecosystem, such as habitat damage and bycatch, has generated a consumer movement for more information on the source and production of a specific commodity. Consumers aware of the potential negative effects of fishing are using their purchasing power to reward products that provide, both information on additional product attributes, and can prove, through certification or other means that the product is in line with the consumer's values. This has led to the proliferation of ecolabels in recent years (i.e. Dolphin Safe, SeaChoice) with the Marine Stewardship Council (MSC) label expanding rapidly and becoming one of the most recognisable eco-labels in the seafood market (Figure 1). The MSC also provides an information document on how to harness the market force of an MSC certification (MSC, 2011). Certification schemes are independent from government initiatives and regulations and are also assessed independently by a third-party assessor. This means that there is no bias regarding what fisheries are certified, as a Conformity Assessment Body (CAB) verifies that the fishery is complying with the criteria in the certification standard at the required level.

Retailers and consumers recognise the power of certification schemes for their businesses and the need to offer more sustainably-certified products in order to attract and/or maintain customers. In recent years, large super markets, such as Wal-Mart, Carrefour, Sainsbury's and Lidl, have all made commitments to increase the proportion of sustainably-certified seafood products in their stores. According to a 2016 list, Sainsbury's was the number one retailer in the UK in 2015 for the percentage of MSC-certified products available (76%, 200 products

(MSC, 2016)). For those at the bottom of the list, only 2 and 5% of their seafood products are MSC-certified. Consumers aware of and interested in such information could use it as the basis for choosing their preferred and most sustainably oriented shopping locations. The retailers requests for more sustainably-certified seafood products, from their suppliers and the wider market, encourages more fisheries to enrol in such certification schemes to maintain market access and competitive prices

Figure 1. A selection of fisheries eco-labels on products.

1.4. Outline of the document

This document is meant as a reference document for other NGOs, industry stakeholders or any other type of stakeholder wishing to harness market forces in a manner similar to MDPI. The origin of each market force is discussed, as well as MDPI's experience and lessons learned from implementing three types of market approaches:

1. Fisheries Improvement Projects (with the goal of MSC certification)
2. Fair Trade certification
3. Traceability

This document does not outline the only method of harnessing market forces and implementing projects, only those from MDPI experiences. As such the information in this document should be considered in the context of small-scale fisheries in eastern Indonesia (primarily tuna), which may need adjustment for the different conditions in different fisheries in different countries. There may be more than one way of utilizing market approaches other than the projects and activities discussed in this document and all options should be explored and fishery conditions assessed before implementation. There may also be other certificates or schemes other than MSC, Fair Trade and Traceability that are better suited to a specific fishery, country and export market. These should be considered in tandem with national and international trade requirements, which can be used to support motivation for a certification, as discussed in the traceability section of this document.

2. FIP involvement towards MSC certification

The Marine Stewardship Council (MSC) is an independent fisheries certification body promoting consumption of sustainably-sourced seafood products through eco-labelling (www.msc.org). The MSC certification and associated blue product label is one of the most recognised seafood eco-labels in the global market. As a result MSC-certified products have access to large international markets and have the potential to influence consumers' buying preferences. Fisheries are awarded MSC certification upon satisfying the required standard for the three MSC principles: (1) fishing activity must be at a sustainable level; (2) fishing operations should be managed to maintain the structure, productivity, function and diversity of the ecosystem on which the fishery depends; and (3) the fishery must meet all local, national and international laws and must have a management system in place that responds to the changing circumstances and maintains sustainability (MSC, 2010).

Fisheries Improvement Projects, FIPs, are initiatives to support a fishery move towards more sustainable practices. FIPs are not officially part of the MSC certification process. However, they are often used to prepare a fishery for an MSC or other certification, by making identifiable, reported progress in adopting more sustainable practices, specific to the requirements of the target certification. Prior to full MSC certification, some FIPs create partnerships with retailers and processors to create market opportunities for fisheries that are not currently MSC-certified but which are making noticeable progress in the FIP (Bush *et al.*, 2013). However, these market opportunities are not always guaranteed.

Indonesian handline yellowfin tuna was part of two MSC pre-assessments, an individual handline assessment in 2009 (Moody Marine Limited, 2009) and as part of the 2010 assessment for Indonesian Pacific and Indian Ocean tuna fisheries in 2010 (Moody Marine Limited, 2010). The latter was the basis for establishing the Indonesian National Tuna FIP. This FIP incorporates three species (yellowfin, bigeye and skipjack) and five gears (purse seine, longline, handline, pole and line and troll) and is currently in its sixth year of implementation. It is led by WWF Indonesia, with certain aspects of the implementation supported by MDPI and others. The number of species and gears included as well as the large spatial scope makes the progress of this FIP towards MSC certification challenging, requiring excellent coordination and reporting systems. MDPI supports the FIP implementation for handline-caught yellowfin tuna in eastern Indonesia as well as the pole and line-caught fishery in eastern Indonesia. This is achieved through close collaboration with the International Pole and Line Foundation (IPNLF) and through the Indonesian association for Pole and Line and Handline fisheries (Asosiasi Perikanan Pole and Line dan Handline Indonesia, AP2HI) and its relevant industry members.

The FIP implementation also requires good relationships with government officials, from district to provincial and national level, other NGOs working on the project and additional stakeholders. Much of the work of the FIP requires organising and structuring the management system, as well as the introduction of new management regulations, to meet international requirements. Given the remote locations of many of the small-scale handline fisheries operations and the previous lack of information on catches and fishing activities, fishermen behaviour is important in terms of encouraging participation, for example, in accurate data collection. For this purpose, MDPI established a data collection system (I-Fish,

www.ifish.id) in 2012 in collaboration with Anova LLC and the USAID IMACS project. The I-Fish data collection system is now in operation in almost 20 sites across West and East Nusa Tenggara, South, Central and North Sulawesi, West Papua and Maluku provinces.

MDPI implements and documents FIP activities in all sites where data collection is active. However, due to the status of yellowfin in the Indian Ocean (overfished), sites whose fishing grounds are part of the Indian Ocean Tuna Commission's (IOTC) area of competence cannot be considered for MSC assessment at this time (West and East Nusa Tenggara). Therefore, sites in South, Central and North Sulawesi, West Papua and Maluku provinces are all currently in the FIP that is reviewed annually by an independent consultant. The review considers these sites in the context of the Western and Central Pacific Fisheries Commission's (WCPFC) area of competence. MDPI, IPNLF and AP2HI developed a workplan, which is revised every year to account for achievements and changing conditions and which divides the work amongst partners. Based on the most recent review in October 2016, the handline component of the FIP in the Western and Central Pacific Ocean currently is doing quite well, with some improvements needed on harvest strategies, some work on secondary species management and attention on compliance and enforcement. The fishery has one pass for performance indicator 3.2.1 related to fishery specific objectives. All other performance indicators score above 80, indicating a pass (figure 2)

Principle	Component	Indicators	Year 5
1	Outcome	1.1.1 Stock status	
		1.1.2 Stock rebuilding	N/A
	Management	1.2.1 Harvest Strategy	
		1.2.2 Harvest control rules and tools	
		1.2.3 Information and monitoring	
		1.2.4 Assessment of stock status	
2	Primary Species	2.1.1 Outcome	
		2.1.2 Management	
		2.1.3 Information	
	Secondary Species	2.2.1 Outcome	
		2.2.2 Management	
		2.2.3 Information	
	ETP Species	2.3.1 Outcome	
		2.3.2 Management	
		2.3.3 Information	
	Habitats	2.4.1 Outcome	
		2.4.2 Management	
		2.4.3 Information	
	Ecosystems	2.5.1 Outcome	
		2.5.2 Management	
		2.5.3 Information	
3	Governance and Policy	3.1.1 Legal and customary framework	
		3.1.2 Consultation, roles and responsibilities	
		3.1.3 Long term objectives	
	Fishery Specific Management System	3.2.1 Fishery specific objectives	
		3.2.2 Decision making processes	
		3.2.3 Compliance and enforcement	
		3.2.4 Management performance evaluation	

Figure 2. Scoring of each performance indicator for the handline component of the Indonesian FIP in the WCFPC area based on the October 2016 review.

Public reporting of FIPs through the Fishery Progress website (www.fisheryprogress.org) is advisable. The fishery progress website publically documents the progress and status of various fisheries enrolled in FIPs, so that consumers and retailers can assess the fishery easily without referring to large documents. The Fishery Progress website also notes whether a fishery has been inactive for a long time, therefore incentivising constant updating.

MDPI is always looking forward with the FIP implementation, towards eventual certification. This means ensuring stakeholders know the long-term process of the FIP and the MSC certification. Given the cost of the actual MSC assessment, good preparation is essential to avoid wasting stakeholders' funds and energy in the case of a failed assessment. Part of the MSC certification is a Chain-of-Custody certification. MDPI applied for funding through the MSC Global Fisheries Sustainability Fund to prepare a risk assessment of small-scale tuna supply chains in Eastern Indonesia, collecting information and providing recommendations on how to achieve compliance with the Chain-of-Custody requirements in order for the supply chains to be ready when their fishery eventually gets certified and they need Chain of Custody to move their certified product.

- Good relationships and coordination are key to achieving the FIP milestones and to preparation for the annual reviews.
- Market benefits from involvement in a FIP are not guaranteed
- It is difficult to keep fishermen, in particular, motivated and involved in the FIP activities. This is in contrast to the Fair Trade certification (discussed below) where fishermen involvement is required and rewarded through a Premium Fund.
- Achieving results in a FIP may take longer than expected. Financial support is needed every year and good records of progress must be demonstrated to donors.

3. Fair Trade certification

Fair Trade is an internationally recognised labelling scheme, informing consumers that the labelled commodity has been produced and sourced in an ethical, fair and environmentally sustainable manner. Fair Trade is defined as '…a trading partnership, based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trade conditions to, and securing the rights of, marginalised producers and workers – especially in the South' (Bowen, 2001). One of the most obvious differences between a certification like the MSC and Fair Trade is the emphasis placed on the social component of the supply chain, i.e. the community from which the product originated. Fair Trade is generally implemented in poorer communities in the Global South, and to support development in the producer communities, certified Fair Trade producers receive a Premium Fund: a pre-defined percentage of the dock price of the raw material

received in addition to the normal product rate. The premium ultimately is paid by the consumer, who due to their knowledge on what the Fair Trade Logo means are willing to pay a little over the normal market price. The premium fund cannot be spent for individual purposes per fisherman. It is pooled into a community bank account and must be spent on improving life in the community, improving production efficient and on conservation or environmental issues in the community.

Fair Trade has traditionally been associated with land-based products, such as bananas, coffee and cotton. These products have sold well, mainly in the markets of developed countries. However, with the growing demand for and consumption in global seafood, coupled with the undesirable state of many stocks and the importance of small-scale fisheries in marine capture fisheries, motivated Fair Trade USA to develop a Capture Fisheries Standard in 2014 (Fair Trade, 2014). The Capture Fisheries Standard incorporates the Fair Trade USA principles relating to empowerment, economic development, social responsibility and environmental stewardship (for more detailed information on the standard, please visit the Fair Trade USA website, www.fairtradeusa.org). Fair Trade USA has a Fisheries Advisory Council (FAC), which advises on the Capture Fisheries Standard and other issues. MDPI, as well as our strong market partner Anova, are members of the (FAC). When the call to pilot the new Fair Trade Capture Fisheries Standard came, Anova volunteered to pilot it in their supply chains, with MDPI as the implementing partner. MDPI works with Fair Trade USA and their newly developed Capture Fisheries (CF) Standard to implement Fair Trade projects in Indonesia, specifically for small-scale yellowfin tuna fisheries. As the industry partner, Anova LLC financially supports the on-the-ground implementation of the Fair Trade program in its supply chains. In return, all certified Fair Trade product is handled through Anova LLC, giving them a competitive edge over other industry stakeholders providing a product to the US market.

The Fair Trade implementation was initially conducted in North Buru and in Ambon island, both in Maluku. Since then, the program has expanded to include South Buru, Seram (both in Maluku) and Toli-toli in Central Sulawesi, as well as Bisa in North Maluku. Expansion into each new site was always tentative, with the long-term implementation of the program not always guaranteed. Anova LLC is the current industry partner supporting the Fair Trade program, and, as a business, Anova requires return on investment to continue a project and maintain profitability. This is a lesson learned, that the Fair Trade program does require sufficient product volumes for the program to succeed but also enthusiasm from the community to ensure ownership and reduce dependence on the NGO partner over the course of the implementation.

- There needs to be sufficient and regular volumes of product to justify the cost of implementing the program. Fair Trade still operates on a business model, whereby there needs to be a high enough product turnover to maintain profitability and continue investment.

- The Premium Fund cannot originate from an NGO or donors or other type of stakeholder. It must originate from the market and industry partners. If this does not occur, an artificial market for the product is established where there is no strong demand for the product. This is not sustainable in the long-term, nor does it allow room for expansion because of the limited funds available to NGOs.

4. Traceability

Traceability differs slightly from the previous two market forces discussed above. In both MSC and Fair Trade certification, having a traceability system or Chain-of-Custody is a requirement to achieving the certificate. As such it is often integrated as one attribute of a particular certification scheme. However, when viewed as a trade requirement/force rather than a market force, traceability becomes a separate, certifiable attribute, as will become apparent in the details provided in this section. Traceability is defined as the ability to access any or all information relating to that which is under consideration, throughout its entire life cycle, by means of recorded identifications (Olsen and Borit, 2013). For MDPI this means tracing the source of the fish from fishermen through processing through to export and making the information available at each stage. This is a difficult task, considering the nature of small-scale vessels, the placement of catches from many vessels into one export container and the potential for mixing across different supplier or retailers along the supply chain (Figure 3). To date, traceability is the only one of the market forces discussed in this document that is in the process of being integrated into Indonesian policy, mainly under pressure from the US and its newly developed Seafood Import Monitoring Program. As such, it departs from a true market force (free from influence of government) and becomes a trade requirement.

The experience of MDPI on traceability is discussed in terms of two projects. The first is the Improving Fisheries Information and Traceability for Tuna and the second is Technology Innovations towards Sustainable Tuna in Indonesia. More details on the implementation and challenges of the specific projects can be found from the MDPI website or in contacting MDPI. This section covers the experiences of these projects specifically related to getting a traceable product on the market.

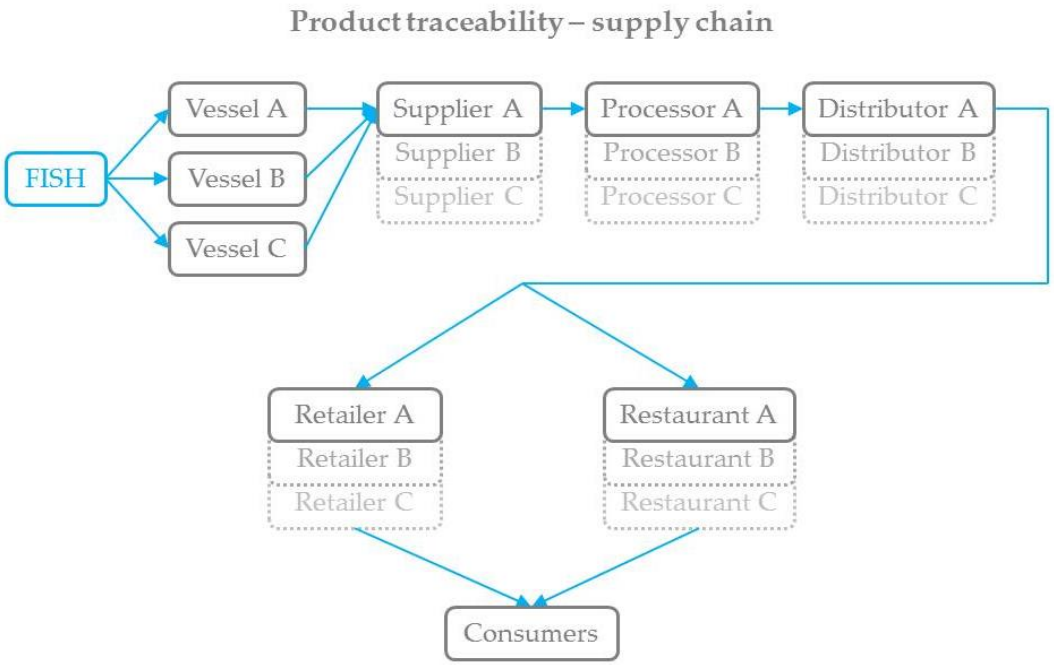

Figure 3. Traceability supply chain showing the flow of fish through each point in the supply chain and the stages which need to be recorded to maintain traceability information (from (Duggan and Kochen, 2016)).

4.1. Improving Fisheries Information and Traceability for Tuna (IFITT)

MDPI's work on traceability began in 2014 in collaboration with University and Research Wageningen ThisFish, Canada and an Indonesian university, Institut Pertanian Bogor (IPB). Wageningen initiated a four-year project called Improving Fisheries Information and Traceability for Tuna (IFIITT). The IFITT project also required the collaboration of several industry partners, namely PT Harta Samudra, BHLN Technical Services, PT Era Mandiri Cemerlang, PT Sinar Purefoods, in order to implement the project in supply chains in Indonesia. The idea behind the IFITT project was to combine the information gathered from the port sampling activities of I-Fish (www.ifish.id) with a consumer-facing traceability system, thereby enhancing the information available to interested stakeholders. Stakeholders could then enter the code found on the product to the ThisFish website and read the background information to their product (Figure 4). At the time, there was no demand from consumers for this extra level of information. In this regard, the IFITT project was attempting to bring the additional information to the consumers, expecting there to be a consequent demand. Prior to IFITT, there was no market pressure on the supply chains to implement such information-intensive traceability for their products.

Figure 4. A demonstration of how ThisFish consumer-facing traceability works.

The implementation was conducted in Labuhan Lombok (West Nusa Tenggara), Bitung (North Sulawesi) and a number of sites in Maluku province. However, as the project progressed, it was clear that the demand in the market for this product with the extra level of traceability was not there in 2 of the 3 suppply chains The concept was proven in the third supply chain, namely the PT. Harta Samudra Fair Trade certified supply chain. As discussed above in the Fair Trade section, achieving the Fair Trade certificate requires careful separation of Fair Trade and non-Fair Trade catches from landing site through to processing plants through to export. This separation is required for the accurate calculations of the Premium Funds to be returned to the communities. Therefore, although there may not have been any direct consumer demand for the information, the requirement under the Fair Trade standard for traceability motivated stakeholders to invest and cooperate to ensure the traceability initiatives worked. The implementation in Maluku expanded to cover four areas by 2016: Central Maluku, North Buru, South Buru and Seram.

Implementing a traceability project in such a fishery required a lot of planning and adjusting to local conditions. In Maluku, , there is limited day time electricity and internet coverage in the area, meaning much of the traceability work at the point of landing was done by hand. A specific coloured tag was tied to the wrapping of each loin (Figure 5) originating from a Fair Trade fisherman. Codes representing the supplier and village were marked on the plastic wrapping. Upon entering the processing plant, all Fair Trade catches were processed first, followed by the non-Fair Trade catches. This ensured good separation between Fair Trade and non-Fair Trade catches and required some initial adjustment in order and flow of actions in the processing plant. This type of planning and potentially restructuring of processing flow is something that should be discussed fully with participating supply chains prior to and during the implementation, to ensure the efficiency and quality control approaches of the company are not disrupted.

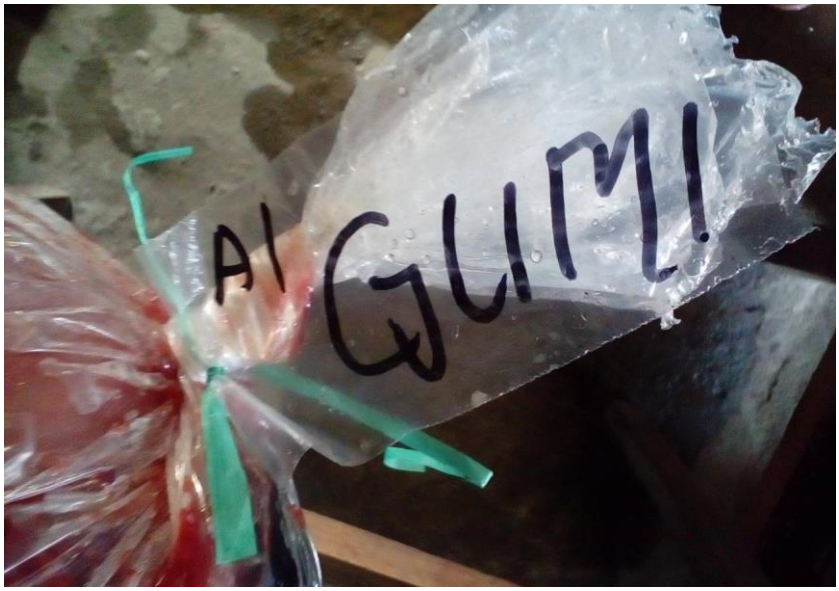

Figure 5. An example of a green tag tied to a loin to indicating Fair Trade caught tuna and the code to indicate the supplier.

- A business case must exist for the market demand to succeed. In the case of Lombok, there was no Fair Trade or Marine Stewardship Council certificate with which to incentivise and frame participation. However, in Maluku, because of the Fair Trade certificate, the traceability initiatives succeeded.

- Traceability is a relatively new market / trade force, with very few products providing the traceability information in such a way that the consumer can identify the path of the fish. Discussions with retailers during the project revealed that whilst they may agree with the idea of providing traceability information, stocking one product with traceability information highlights the fact that their remaining products are not traceable to the same level, creating a high risk for consumer demand for these untraceable products.

- Partnership with an industry stakeholder greatly improves the initial access to various stakeholders in the supply chain. It does not, however, guarantee that the initiative will succeed.

4.2. Technology Innovation towards Sustainability of Tuna Fisheries in Indonesia

MDPI entered a consortium with Wageningen University, Institut Pertanian Bogor (IPB), and industry partners Anova LLC and P.T. Harta Samudra, with funding from the Netherlands Organisation for Scientific Research (NWO). This was a 15-month project, beginning in November 2015 and built on the work from the IFITT project whilst introducing technologies to the supply chains. The aim of the project was to develop Traceability-Based Technology (TBT) that creates a bidirectional exchange of information between Indonesian fishers,

processors and traders, helping to link fishers with fisheries information and global markets and also helping processors and traders meet the informational requirements from importing regions, such as the US and EU. Four technologies were introduced to the supply chains:

1. Tally-O: internal traceability system for processing plants
2. Spot Trace: satellite-based geo-positioning device
3. Dock: app for port sampling activities
4. OurFish: app-based bookkeeping system for suppliers

The Dock and OurFish technologies were not motivated by market forces or specific demands by consumers and are therefore not discussed in detail in this document. Instead they were motivated by the goal of improving efficiency and reducing human error in data collection and storage. The information from Spot Trace devices is sometimes demanded by consumers, who wish to know at exactly what location their fish was caught and by whom. However, providing information on the general area of catch is usually sufficient for most consumers and as yet the market does not demand for exact fishing location. The deployment of Spot Trace was mainly to test whether such approaches are feasible for small-scale fleets.

The US recently introduced a Seafood Import Monitoring Program (SIMP, (NMFS and NOAA, 2016)). This will come into effect for the listed species from January 2018 and will require detailed information on items such as origin of the catch and fishing gear used. The EU also operates a catch certificate system (EC, 2009). There is an incentive to comply with the EU catch certificate: countries not complying will be given 'yellow card' or 'red cards', depending on the severity of the non-compliance, and these cards can affect a country's access to the EU market. Therefore, a big trade force motivating the introduction of the Tally-O system is continued access to lucrative international markets. This system could be implemented using a paper-based scheme. However, given the volumes of product and the information requirements, it is more efficient for these systems to take advantage of the technology available. Using technology for data collection also facilitates combining different information streams to match the information requirements. Tally-O was designed and implemented to meet this need. EcoTrust Canada were contracted to develop the software and hardware solutions required for Tally-O implementation in the partner processing plants. Tally-O was implemented in an Indonesian-based and a Vietnamese-based processor (part of the same supply chain). The aim of Tally-O is to improve efficiency of data recording by eliminating paper-based tallying, to improve traceability of production lots and to facilitate the production of reports. The reports produced from Tally-O can then be used for catch certificates and import monitoring requirements for access to international markets.

The software used for Tally-O is open source and available from GitHub. This means that any interested party, be it an NGO similar to MDPI with industry partners or an individual partner can take the code and develop it to suit the conditions of their processing plant.

- From the Tally-O experience, the regulatory and market requirements for traceability motivated industry partners to support the project, ensuring efficient technology was developed for their supply chain. This lays the groundwork for expanding the technology to other supply, as there is a success story to discuss with looking for partners.

- Similar to the experiences with IFITT, the market demand and associated price premium does not yet exist for traceable seafood. Instead the price premium, at the moment, is associated with a market certification, of which traceability is one component.

5. Harnessing market forces to target domestic markets

To date MDPI's implementation of market forces has focused on tuna small-scale fisheries, where the product is exported to US markets and where an understanding and therefore demand exists for sustainably-certified seafood. MDPI conducted a survey to examine the domestic demand for an Indonesian-sourced certified product (West Papua mud crab). 60% of respondents had never heard of fisheries certification schemes, such as the Marine Stewardship Council or Fair Trade and only 3% said they only purchase certified products. Although this was a small study, it suggests that the domestic demand for a certified product sold at a price premium does not yet exist in Indonesia. This lack of demand could be explained by a number of other factors influencing consumers' purchases in Indonesia, of which sustainability is not of high enough priority to justify a higher spending. As Indonesia continues to develop and consumer awareness regarding additional issues, such as sustainability, improves, it is likely that a domestic market for such products could emerge. However, until then, using market forces to generate change in supply chains with products destined for an international market is likely to generate the largest effects. This is likely to be the same situation in other countries in similar stages of development as Indonesia and should be clarified before embarking on a project aiming to provide a certified product to a domestic market.

6. Summary

- Initiatives are much more likely to succeed if they are supported by one or more industry stakeholders.

- There needs to be a business opportunity for an initiative, otherwise industry stakeholders are unlikely to invest the time and effort required.

- In some cases, companies and stakeholders are unwilling to invest in additional efforts beyond those that satisfy government regulations. This can be caused by a number of factors, such as time, money, other life priorities, etc.

- Fair Trade Premium Funds must be sourced from the market demand.

- Given the nature of small-scale fisheries, it is often easier to work with projects where consumer demand is already established, rather than trying to establish a system and then generate consumer demand for the information. Retailers are more willing to engage in such projects as they are viewed as low risk.

- Import regulations to large international markets are a good way to incentivise industry participation and support for initiatives.

- Price premiums are not always guaranteed. There is the Premium Fund associated with the Fair Trade certificate but there is no similar definite financial return associated with the MSC certification. It may or may not result from the process.

- Market opportunities for fisheries entering a FIP are not always guaranteed.

- When introducing an initiative aimed at a specific market force (i.e. certification or traceability) to a fishing community, special care should be made to clarify what can or cannot be expected from participation and no promises of benefits, either financial or otherwise, should be made.

- Domestic demand for a certified product may not yet be established, in which case pursuing certification for a domestically-consumed product may not be as successful as hoped for.

- An analysis of the dynamics of the international market for the seafood product should be conducted before project implementation.

- Maintaining good relationships with stakeholders and ensuring a two-way flow of benefits is important for long-term implementation of certifications and traceability initiatives.

- A new product attribute, such as traceability, may not be fully followed by retailers until a certain proportion of their products can achieve the same product attribute. This is because of the retailer aversion to having one product with a particular product attribute, highlighting how bad the other products perform at the current moment in time.

- National and international trade requirements should be assessed before deciding on what market force to work with. Trade requirements can be used as motivation for participation in a market-based initiative, such as traceability.

- Important to keep sight of the big picture and what is to be achieved, preparing stakeholders well in advance to ensure their understanding and collaboration.

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