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Fisher and Trader Responses to Traceability Interventions in Indonesia

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ABSTRACT

Calls for increased traceability of seafood have been frustrated by a poor understanding of the social dynamics shaping the flow of fish and information in global value chains. Contrasting with utilitarian and regulatory approaches, this article proposes a social practices intervention framework to understand the effect of traceability interventions ensuing from the EU IUU regulation and Fair Trade USA seafood certification program on fishers and traders operating in remote tuna landing sites in Indonesia. The framework demonstrates how the success or failure of traceability interventions depends on both alignments with (1) the performance of “targeted” and (2) “non-targeted” value chain practices as well as (3) “non-targeted” practices adjacent to the value chain. We conclude that the social practices intervention framework can provide improved insight and guidance on the uptake of traceability and other market-based governance approaches across a range of locally embedded fisheries landing sites.

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Introduction

The lack of transparency in global seafood value chains has given renewed impetus to traceability as a means to facilitate “the right to know” where and how seafood is produced, processed and traded (see Lewis and Boyle 2017; Bush et al. 2017). Well-established food-safety related traceability commonly preserves the identity of products between two nodes of the chain for food-safety recalls down to processors. In contrast, the new generation of full-chain seafood traceability initiatives aims to convey information from the point of landing or even catch to consumption (Mol and Oosterveer 2015).

To make value chain actors document and share information about how seafood is produced, traceability is being built into both public and private governance arrangements. Public schemes like the European Union (EU) Illegal, Unregulated and Unreported (IUU) regulation requires all fish products imported into the Common

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Market to be accompanied by a catch certificate that verifies the legal, reported and regulated status of the fish (European Commission 2009). Similarly, the United States implemented the Seafood Import Monitoring program (SIMP) in 2018, which requires importers to report key data on 13 IUU vulnerable species from the point of harvest to the point of entry (Willette and Cheng 2018; He 2018). Private schemes, including certification programs like the Marine Stewardship Council and Fair Trade USA, require a full chain of custody for certified products from harvest to retail (Roheim and Zhang 2018).

While the number and type of traceability schemes are expanding, there remains a limited understanding of how this intervenes and changes existing production and trading practices in seafood value chains. This is particularly the case in fisheries in the global South, which provide 59% of internationally traded seafood by volume and are perceived to pose the greatest IUU risk (FAO 2018). The complex social dynamics that organize behavior upstream in global value chains are not well understood by those designing traceability interventions and, largely remains what Bush and Oosterveer (2007) have labeled a “black box.” We argue that this metaphorical black box has to be opened to understand how traceability schemes are incorporated in the everyday routinized practices of fishers (those that harvest fish), traders (often referred to as middlemen or patrons that are positioned between fishers and processors, see Crona et al. 2010; Merlijn 1989; O’Neill and Crona 2017; Miñarro et al. 2016), and other actors (both government and market). This is crucial because where traceability is not successful this affects not only the legitimacy of the interventions but more importantly the inclusion of these types of fisheries and their associated value chains into global markets.

Building on Boonstra and Hentati-Sundberg (2016); Boonstra, Birnbaum, and Björkvik (2017) and following Doddema et al. (2018), we propose that a social practices approach offers a novel way to open up this black box and understand responses to the implementation of traceability requirements. This study provides an in-depth description and analysis of where, how and why traceability components of the EU IUU regulation and the Fair Trade USA certification program change harvest and trade-related practices as they are performed by fishers and traders and as they are embedded in a wider set of chain and non-chain social practices (e.g., Shove, Pantzar, and Watson 2012; Schatzki 2002; Spaargaren, Weenink, and Lamers 2016). Indonesia as the world’s largest archipelagic nation was considered a suitable study environment, not only because of the high proportion of tuna landings and exports which makes fisheries subject to increasing calls for transparency, but also because tuna is landed in ports and fishing communities that remote and far from central government oversight (Halim et al. 2019; Bailey et al. 2015; Adhuri et al. 2016; Sunoko and Huang 2014; Duggan and Kochen 2016).

In the following section, we introduce a theoretical framework for analyzing responses to traceability requirements. After describing our methodology and further background information on public and private traceability arrangements in Sections “Methodology” and “Public and Private Traceability Governance Arrangements,” we present our findings for the implementation of the EU IUU regulation and Fair Trade USA in two remote tuna landing sites in Indonesia. We conclude the paper with a discussion on the value of a social practices approach for better understanding the uptake

and impact of traceability demands and for contributing to the design of more effective and legitimate traceability interventions in the future.

A Social Practices Intervention Framework

By placing new informational demands on fishers and traders, traceability schemes aim to bring greater transparency to existing flows of information through global value chains (Bush et al. 2017). To comply with demands for traceability, changes need to be made to the flow of fish products and the processes (e.g., recording, labeling) and materials (e.g., notebooks, tags, and labels) by which information is attached to these products. Together these information flows, products, processes, and materials constitute a set of what can be referred to as “social practices”; that is, the shared and routinized “ways of doing” that provide the core units of analysis to understand human behavior and how it changes (Schatzki 2002; Shove, Pantzar, and Watson 2012; Spaargaren, Weenink, and Lamers 2016).

A social practices perspective differs from other behavioral theories in that it does not focus on the attitudes of individuals or the enabling or constraining conditions that inform intervention uptake (Schatzki 2002; Shove, Pantzar, and Watson 2012; Spaargaren, Weenink, and Lamers 2016). Instead, a social practices perspective while considering rules and attitudes, focuses on a wider range of factors that play a role in social change such as technology, competences, and teleo-affectivities and always by means of how these multiple factors are drawn upon in the enactment of situated and routinized practices (Spaargaren 2011). Social practices, such as catching, landing and trading fish, are deliberate but unconscious series of social interactions and applications of technologies that enable an actor to achieve a specific goal. By understanding how social practices targeted by interventions are done and connected to other practices it is possible to identify how, where and why they are accepted, rejected or adapted.

Analyzing the impact of traceability interventions on social practices is organized along two lines of inquiry. First, we seek to understand how informational demands alter the ways targeted practices are performed. Second, we investigate how interventions affect how targeted practices are embedded in wider configurations of social practices (Shove, Pantzar, and Watson 2012; Spaargaren, Weenink, and Lamers 2016).

Performance is the situated enactment of a practice through the recurrent combination of the following elements: (1) the written or unwritten rules and norms that structure the practice, (2) the meanings or general understandings on what the practice is about, (3) the skills and competencies needed to perform the practice, (4) the material objects and infrastructures that co-constitute the practice, and (5) the goals (or “teleo-affective structures”) that give direction to the behavior of the practitioners (Schatzki 2002; Shove, Pantzar, and Watson 2012). Where a traceability intervention adds, removes or changes elements of existing social practices, it alters the ways these targeted practices are performed. When looking at traceability interventions, “targeted” practices refer to those primary to handling the flow of fish; including fishing, landing vessels, packing, transportation to processors, as well as recording, labeling and repacking for transport to the next node in the value chain (Bailey et al. 2016). Depending on what the intervention does to the existing elements, both separately and in combination, we

can expect different kind of “responses” from the side of practitioners, that can directly change the performance of an existing targeted practice or introduce new practices altogether.

Embeddedness can be specified as the nature, mutual dependencies and strength of the linkages between social practices (Spaargaren, Weenink, and Lamers 2016; Spaargaren 2011). Practices can hang together and become aligned via shared goals, via common infrastructures, or via shared temporal rhythms or spaces (Schatzki 2011). Existing configurations can be broken or transformed when new practices are introduced that do not align well with the goals, technologies, and skills of the existing practices. To understand responses, it is important to consider the interdependencies between targeted and non-targeted practices (such as debt repayment and labor reciprocity). For example, traceability information generated during the practice of grading tuna may impact subsequent practices of chilling, packaging or storage, which in turn reinforce or undermine whether traceability will be successfully implemented. Furthermore, it is important to consider how specific practice elements held by socially networked practitioners affect the overall configuration of practices associated with a given intervention (Schatzki 2002; Walker 2014; Smale, van Vliet, and Spaargaren 2017). Responses are shaped by the impact the intervention has on both the direct and indirectly targeted social practices as elements or entities which together constitute the value chain.

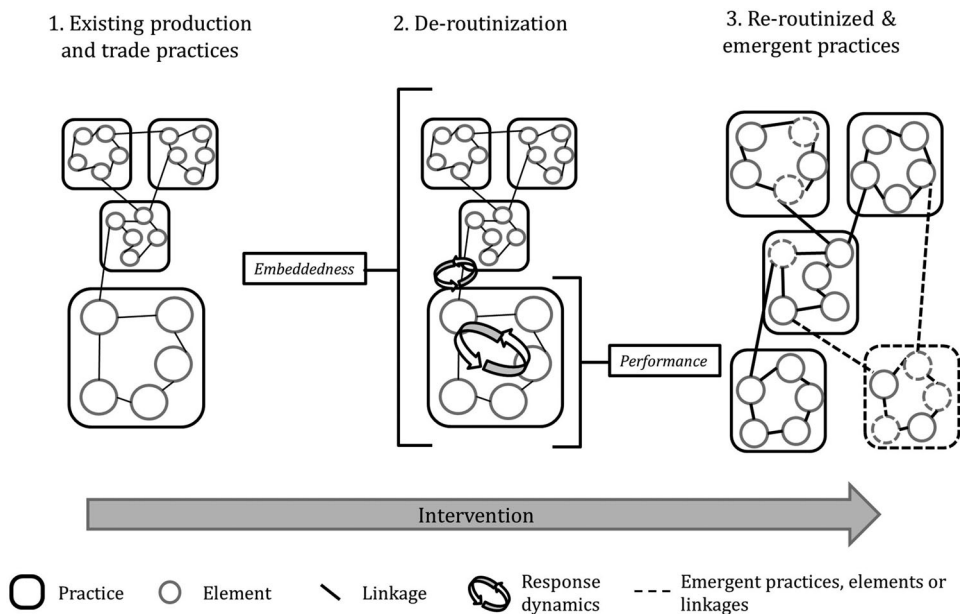


Figure 1. Social Practice Intervention Framework. The figure showcases the conceptual model adapted from Doddema et al. (2018) and inspired by practice theory (Schatzki 2002; Shove, Pantzar, and Watson 2012; Spaargaren, Weenink, and Lamers 2016) that is used to study responses to interventions. The figure depicts the three analytical steps of the framework: the existing sets of practices, the deroutinisation resulting from the intervention and the re-routinisation of existing sets of practices and the emergence of new practices. In each step, both the performance, that is, the active integration of elements as well as the embeddedness, that is, the linkages between sets of practices are explored.

Both orders of practice are assessed using the social practices intervention framework illustrated in [Figure 1](#) (Doddema et al. 2018). The framework focuses first on a thick description of the performance of existing routinized social practices involved in handling the flow of fish. Second, interventions bring moments of “deroutinisation” for both targeted and non-targeted social practices, which means they are subjected to reflection, reconsideration, and debate, and in turn processes of transformation both regarding their performances and embeddedness. The combined effect of and the interplay between changes in performance and embeddedness of targeted and non-targeted practices is what we refer to as the *response dynamics* generated by an intervention.

Methodology

The social practice intervention framework ([Figure 1](#)) informed the analysis of response dynamics in the two cases, namely the EU IUU regulation in Labuhan Lombok port in Nusa Tenggara Barat and the Fair Trade USA certification of fishing groups in Buru island, Maluku.

Following Nicolini (2012), the cases were analyzed by switching back and forth between the analytical lenses of “zooming in” and “zooming out” and relied on interpretative social science methods. Zooming in focuses on the performance of a single practice in detail, while zooming out focuses on the (changing) relationships between sets of practices. For each case, the existing social practices, interventions, changes in performance and changes in embeddedness are described. Together these factors inform the authors’ interpretation of whether an intervention is accepted, adapted or rejected. Based on the in-depth exploration of the social dynamics that organize responses to interventions in the two cases, analytical generalizations are made about the uptake of interventions in the first mile of seafood value chains (Halkier 2011).

To zoom in on selected practices a combination of observation and in-depth interviews were used while the zoomed out data collection relied on interviews. Between October 2016 and May 2017, the bulk of the data was collected using a combination of observation of interactions at tuna landing sites, mini-plants and in communities and in-depth, semi-structured interviews. A total of 30 interviews were conducted with fishers (5), traders (16, of which two were women and 14 men), processing industry (3) and NGOs (6) covering both sites. Respondents were selected using snowball sampling with the main criteria being that they handle tuna or information attached to tuna in either of the selected sites. During the interviews, a retrospective understanding of the various iterations of each intervention and associated response dynamics was generated using the topic list in [Appendix A](#). Interviews and observations were organized until variations in responses were so low that no additional interviews were deemed necessary. Between July - October 2018 four follow-up interviews were organized with seafood industry experts to clarify certain information and particularly to understand the goals of the traceability schemes. All interview transcripts and observation notes were coded, categorized and analyzed using Atlas.ti using categories specified in the social practices intervention framework.

Public and Private Traceability Governance Arrangements

The EU IUU regulation and Fair Trade USA certification represent public and private governance arrangements that, in part, rely on traceability to address environmental and social concerns. The following describes these two types of traceability arrangements to allow for a more comprehensive reflection on the different challenges they face in being implemented in real-life settings.

Public governance arrangements are traditionally top-down with the state defining the rules outlining what is permitted and what is not. Rules are enforced at multiple levels and connected to sanctions for noncompliance (Stoker 1998; Kooiman 2003). An emerging trend is that major consumer markets are setting mandatory requirements to deter imports of IUU seafood products (Bellmann, Tipping, and Sumaila 2016; Young 2016). This is exemplified by the EU IUU regulation that seeks to establish a community system to prevent, deter and eliminate IUU fishing (European Commission 2009). The EU IUU regulation operates on the assumption that impeding EU market access for IUU products reduces the economic incentive for IUU fishing and that the benefits of access to the EU market, outweigh the costs of exclusion (Leroy, Galletti, and Chaboud 2016). Through the catch certification requirements, access to the EU market is conditioned on proof that seafood imported into the EU is legal, reported and regulated.

Private governance has gained popularity as an alternative and complement to state-based regulation (Kalfagianni 2014), especially since the 1990s. Third-party certification is one form of private governance where non-state actors coordinate and specify standards and rules that have to be complied with to become and remain certified (Auld, Renckens, and Cashore 2015). Because participation in certification programs is voluntary, market access and other incentives drive compliance. The Fair Trade USA seafood program commenced in 2014 with the aim to empower socially and environmentally responsible small-scale fishers (Fair Trade USA 2014). Fair Trade USA requires that fishers take on new functions in harvest and post-harvest that help to improve their bargaining power (Bailey et al. 2016). This reorganization of the value chain is incentivized via a social premium—paid for by consumers in the US—that can be used collectively for community development and environmental stewardship.

To the author's knowledge, studies on these new forms of traceability have primarily focused on macro-level institutional analyses. In the case of the EU IUU regulation, studies focus on the alignment of the regulation with international trade law (Tsamenyi et al. 2010; He 2017; Young 2016), on institutional challenges with implementation of the regulation by the EU (Elvestad and Kvalvik 2015; Leroy, Galletti, and Chaboud 2016) and exporting countries (Beyens, Failler, and Asiedu 2018). In the case of Fair Trade USA only two studies on seafood were identified which is most likely a consequence of its recent emergence. The first focused on consumer awareness and willingness to pay for seafood sustainability initiatives (McClenachan, Dissanayake, and Chen 2016) and the second explores the role of middlemen in the implementation of Fair Trade regulation (Bailey et al. 2016). Except for Bailey et al. (2016), none of the aforementioned studies focus on how these global schemes are being translated into concrete interventions that affect social practices on the ground.

Results

In this section, we describe how the traceability objectives of the EU IUU regulation (5.1) and the Fair Trade USA certification (5.2) intervened in existing sets of practices in two different remote tuna landing sites in Indonesia.

EU IUU Regulation in Labuhan Lombok

To comply with the EU IUU regulation, exporters have to obtain catch certificates that verify that fish have been caught and landed in compliance with (inter)national regulations. In Indonesia, the Minister Marine Affairs and Fisheries (MMAF) Regulation No. 13/2012 outlines the procedures for obtaining catch certificates (*Sertifikasi Hasil Tangkapan Ikan*, or SHTI). For fisheries operating out of remote and smaller ports, a two-step process is specified. Vessel captains first have to obtain a “certificate of fish landing” (*Surat Keterangan Pendaratan Ikan*, or SKPI) from the head of the fishing port and second, have to compile and send the SKPI along with a shipment of tuna to the exporter. Exporters then are responsible for submitting the SKPI to a local competent authority that can be found in a handful of larger fishing ports that issues the SHTI documents for export. The following describes the re-organization of the existing set of social practices in response to these two interventions (see [Figure 2](#)).

Obtaining the SKPI

The MMAF regulation specifies that to obtain the SKPI, a vessel captain must first obtain a “verification letter of fishing landings” (*Laporan Hasil Verifikasi Pendaratan Ikan*, or LHVPI) from the head of the fisheries surveillance department (*Direktorat Jenderal Pengawasan Sumber Daya Kelautan dan Perikanan*, or PSDKP) based in the port. The LHVPI is issued after verification of the vessel name, fishing license, fishing gear, date, fishing area, base port as well as the weight and identification of the species caught during that fishing trip. The vessel captain is then required to go to the head of the fishing port who verifies the identity of the vessel captain, fishing license, fishing logbook, the sailing permit, and the LHVPI and then issues the SKPI.

While the MMAF regulation specifies the different roles and responsibilities for obtaining the SKPI, respondents indicated that in Labuhan Lombok exporters and their suppliers play an instrumental role in organizing permits needed to trade to the EU, something that is not recognized in the regulation. With exporters facilitating trade they, rather than governments, push the requirements for collecting the SKPI down the chain. Furthermore, the MMAF regulation specifies that vessel captains are responsible for obtaining the SKPI, which goes against the existing practices that organize documents needed to fish and trade in Labuhan Lombok port. In reality, obtaining permits in Labuhan Lombok is organized by traders as part of the agreements with fishers to secure supply. Obtaining permits needed for fishing and/or trade is an established means, alongside providing credit, gear, vessels and/or fuel, through which traders strengthen the fisher’s loyalty. Fishers rather than navigating port bureaucracy themselves let traders take up this role as they prefer to spend their short periods on land resting, spending time with family, working on vessels and gear and planning their next trip.

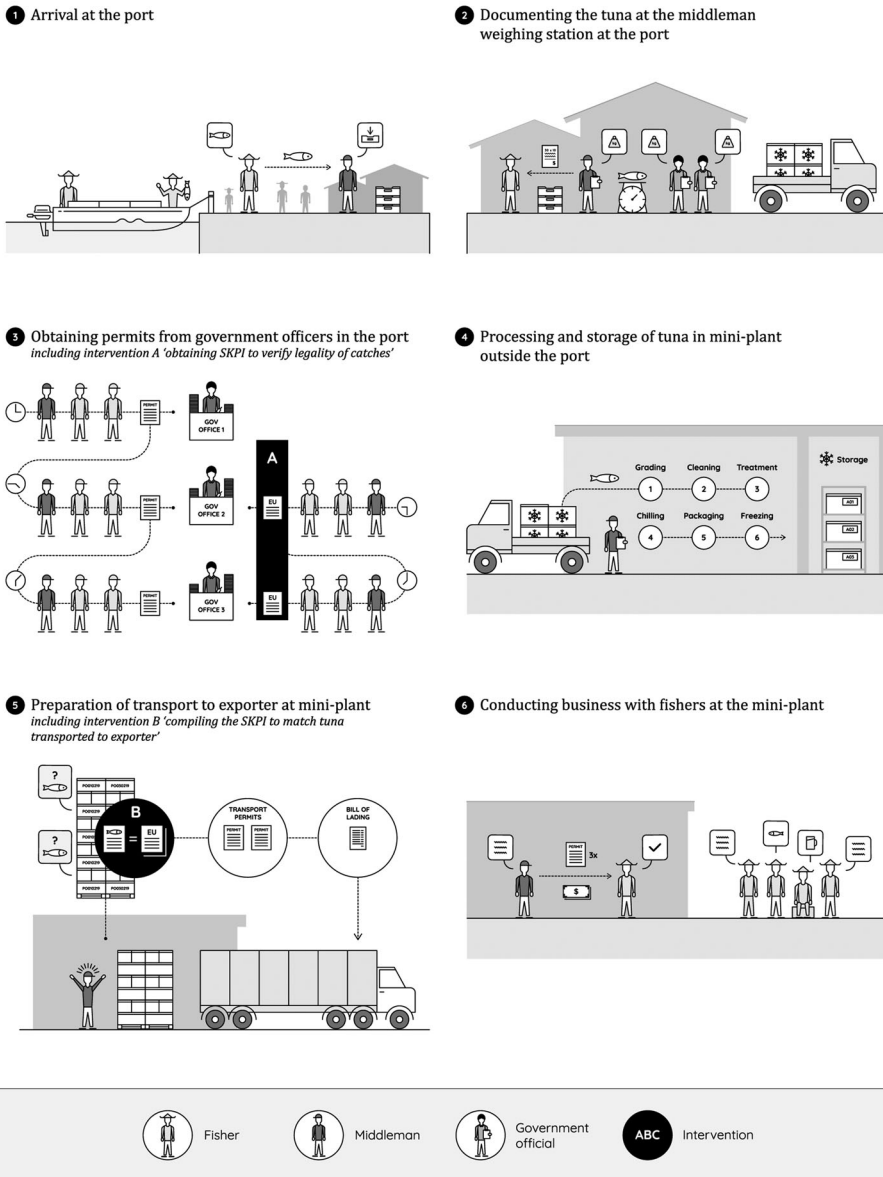


Figure 2. Practices organizing the flow of tuna and information in Labuhan Lombok. The six images depict the sequential (daily) sets of practices performed by practitioners at various places in and around Labuhan Lombok port that are implicated by the EU IUU regulation. The two interventions are shown in black boxes. These include Intervention A “obtaining the SKPI to verify legality of catches” and Intervention B “compiling the SKPI to match tuna transported to the export.”

As illustrated in step 3 of Figure 2, obtaining the SKPI is incorporated into the existing obtaining permit practices that are performed daily by trader staff. While incorporation was relatively smooth as a result of the preexisting competences of trader staff to navigate port bureaucracy, the following challenges were identified.

First, when the EU IUU regulation was initially rolled out respondents indicated that the two key government officials, namely the head of PSDKP and the head of the fishing port, were not always available to sign the LHVPI or the SKPI at the times when trader staff would come to their office. As one respondent illustrated, “it doesn’t take long to obtain the letter [SKPI] if the one who needs to sign the document is there, but it can be tricky when that person is not there, then we have to go search for them to get the signature.” The availability of these two government officials remains a bottleneck in obtaining the permits, but this challenge was overcome in part by trader staff who adapted their daily routines to align with those of these two government officials.

Second, one of the key documents that have to be submitted to obtain the SKPI, namely the sailing permit (*Surat Persetujuan Berlayar*, or SPB) is only legally mandated for fishing vessels over 10 and 5 gross tonnes respectively, with no provisions made for smaller vessels. As a consequence, small-scale fishers were initially excluded from obtaining the SKPI and thus meeting the EU import requirements. Respondents indicated that traders were able to convince the government officials to issue the SKPI for these smaller vessels due to the routine interactions between traders and government officials to address practical and bureaucratic hurdles to ensure fishing and trade can occur.

The introduction of the SKPI was taken up into obtaining permit practices with relative ease. Incorporation proved to be contingent on the ability of trader staff to navigate the port bureaucracy and traders maintaining relationships of mutual dependencies and trust with both fishers and government officials.

Compiling the SKPI for Transport

The MMAF regulation states that the processor or exporter must submit the SKPI to a local competent authority but does not prescribe how SKPI and associated tuna batches have to be transferred through the chain. Respondents indicated that the SKPI permits become part of a set of documents that are collated and sent with a shipment of tuna from the trader to the exporter. As shown in step 5 of [Figure 2](#), the compilation of the SKPI to match the tuna transported to the exporter is introduced to the practice of transport preparation. Transport preparation entails loading tuna into the shipping container after all corresponding documents needed to send a shipment of tuna to the exporter have been gathered. Existing documentation included the bill of lading that has to be drawn up detailing the weight and quality composition of the shipment, a Certificate of Origin and a hygiene certificate. The compilation of the SKPI was superficially appropriated into existing practices for the following reasons.

First, respondents agreed that obtaining and compiling the SKPI permits causes delays in shipments to exporters in the fishing high season. It is then that one vessel can catch enough tuna to fill a single container which is then ready for shipment to the exporter within one or two days after landing. Despite the specialized competences developed by trader staff to obtain the SKPI, the documents are sometimes not yet available when a shipment is ready to be sent to the exporter. This “slowing down” is only grudgingly accepted where the SKPI is a strict requirement from exporters who need to fulfill production orders for the EU. In these situations, the bureaucratic nature

of the new information demands, whilst essential to export to the EU, do not align well with the fast-paced nature of trade and the constant demand for tuna by exporters.

Second, respondents reported substantial variation in trader recordkeeping practices. This becomes an issue for compiling the SKPI where traders do not track batches per fishing trip or where catches from one fishing trip are split up or mixed into specific batches for trade. Catches are split when the entire catch does not fit the size of the transport container or when there are differences in the quality of the tuna which determines whether tuna is destined for export to the EU, other export markets or domestic consumption. Catches can be mixed in containers when catches from multiple fishing trips have relatively low volumes. Because the SKPI corresponds to tuna caught on specific fishing trips, splitting and mixing catches leads to considerably greater effort to ensure that the volumes reported on the SKPI correspond to the actual volumes being sent to the exporter. Furthermore, for traders that do not define (and track) batches per vessel, but for example per date, the compilation and matching of these documents take more effort. Several respondents indicated that for some traders it is less effort to gather the SKPI that reports the highest catch volumes and load the containers accordingly rather than spend the time compiling the actual forms that correspond to the tuna in the container. While traders may be approached by government officials to provide evidence to support the SKPI, oversight remains weak.

The adaptation of the transport preparation practice is driven by the desire to meet exporter demands. However, the increased administrative burden, the lack of oversight of the process where tuna is moved outside the port, and the variation in how catches from a fishing trip are recorded and tracked through (pre-)processing all indicate a selective appropriation rather than simple acceptance.

Fair Trade USA Certification in North Buru

The Fair Trade USA Capture Fisheries Standard (CFS) set out the rules that a fishery and its supply chain must comply with to be certified. The Moluccan yellowfin tuna handline fishery, which includes fisher groups from North Buru, became the first Fair Trade USA certified fishery in 2014 (see Bailey et al. 2016). A core component of the Fair Trade USA CFS is the required implementation of a traceability system to ensure only fish caught by Fair Trade registered fishermen is sold as such (Fair Trade USA 2014). Compliance with the standard, including the establishment of a traceability system in the North Buru communities, was supported by the Indonesian NGO *Masyarakat dan Perikanan Indonesia* (MDPI) and focused on two goals. First, implementation of a system to physically identify tuna loins caught by Fair Trade fisher groups throughout the value chain, and second, recording Fair Trade product transactions at every point in the value chain. The following describes the re-organization of the existing set of social practices in response to interventions to achieve these two goals (as illustrated in Figure 3).

Identifying Fair Trade Tuna Loins in the First Mile

To trace tuna loins caught by different Fair Trade fisher groups through to processing facilities MDPI sought to introduce physical Fair Trade product identifiers. The goal of

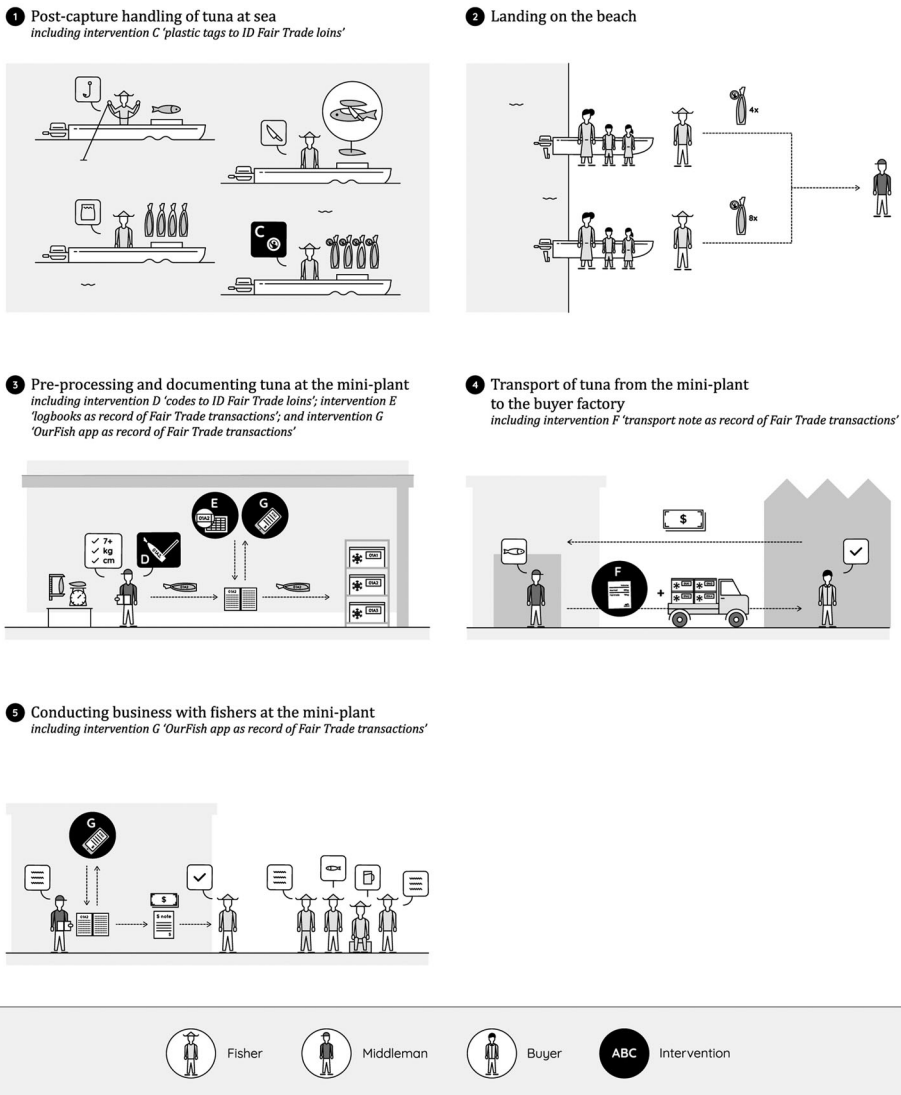


Figure 3. Practices organizing the flow of tuna and information in North Buru. The five images depict the sequential (daily) sets of practices performed by practitioners at various places in and around fishing communities in North Buru that are implicated by FairTrade certification. The five interventions are shown in the black boxes. These include Intervention C “plastic tags to ID Fair Trade loins,” Intervention D “codes to ID Fair Trade loins,” Intervention E “logbooks as record of Fair Trade transactions,” Intervention F “transport note as record of Fair Trade transactions” and Intervention G “OurFish app as record of Fair Trade transactions.”

these identifiers was to enable tuna loins to maintain their “identity” from the moment the tuna is caught, through the post-capture handling on the fishing vessel to processing in the Fair Trade buyer’s factory.

The first identifier was a physical tag placed on the plastic sleeve encasing the tuna loins after capture, see step 1 of Figure 3. The existing post-capture handling practice entails cutting a tuna into four loins once it is brought on board and then encasing

each loin in a plastic sleeve and covering the loins in ice in a Styrofoam icebox to preserve quality. Besides preserving quality, this practice is performed as quickly as possible so that the fisher can catch up with and continue to fish the continually moving schools of tuna. MDPI requested that fishers tie two colored plastic strings around the end of the plastic sleeve before storing the tuna loins in the icebox. A green plastic string to identify the loin as Fair Trade and a unique colored plastic string to represent the fisher group.

The introduction of the plastic strings was rejected for two reasons. First, the plastic strings sometimes fell off the plastic sleeves after handling by traders, which meant the strings no longer met the MDPI's objective to trace loins until the factory. Second, fishers elected not to put the strings on the bags as they prioritized completing the post-capture handling as quickly as possible to continue fishing.

The second identifier was a written Fair Trade group code on the plastic sleeves encasing the tuna loins. When the tuna loins arrive at the trader's mini-plant they are removed from the plastic sleeves to check the quality and weight. This information is recorded in the traders' A5 notebook after which the loins are reinserted into the plastic sleeve and stored in a large icebox as shown in step 3 of [Figure 3](#). Recognizing that loins are already enumerated in this pre-processing practice performed by traders, MDPI asked traders to write the Fair Trade group code on the plastic sleeve whilst pre-processing the loins in the mini-plant.

The introduction of the coding into the pre-processing practice was rejected for two reasons. First, the coding was perceived to slow down the pre-processing practice in the mini-plant, which goes against the dominant logic and the importance of preserving the quality of the loins. Second, traders resisted the coding because despite the Fair Trade groups being formed and organized around them (see [Bailey et al. 2016](#) for more detail), the Fair Trade requirements do not recognize their role or give recognition to the changes made by traders to facilitate the Fair Trade certification of the fishery.

The failure of the coding intervention meant that there was a period within which no coding was done and, as a result, no Fair Trade premium was generated. Consequently, the Fair Trade fisher groups, with support from MDPI, negotiated with the traders to agree on how coding could be implemented in the pre-processing practice after all. It was ultimately agreed that the Fair Trade groups would pay the trader's staff a percentage of the Fair Trade premium for the volumes of loins coded. This still involved the introduction of new elements to the pre-processing practices, but with two important differences. First, the immediate financial incentive. Second, the reinforcement of mutual dependencies between fishers and traders beyond credit and material provided by traders and fisher's commitment to sell tuna to that trader.

Records of Fair Trade Product Transactions

While traders already record all product transactions with fishermen in an A5 notebook as part of the pre-processing and conducting business practice, contrary to the Fair Trade requirements it is difficult for an external party to determine which records concern Fair Trade or non-Fair Trade transactions. To trace tuna loins caught by different Fair Trade fisher groups throughout the value chain, MDPI made several attempts to generate consistent records of all Fair Trade product transactions.

First, MDPI distributed preprinted logbook forms to both Fair Trade fishers and traders to systematically record information about Fair Trade catches and interactions with endangered, threatened and protected (ETP) species. While this information is gathered to inform fisheries management and to supplement enumeration data (see Duggan and Kochen 2016), for traceability purposes it was the ability to triangulate catch data as fish moved through the chain. As outlined in Doddema et al. (2018) fishers rejected the logbooks because filling them in disrupted post-fishing activities and they saw no added value from the data.

The logbook was rejected in the pre-processing practice for the following reasons. First, as the A5 notebooks contain the catch information of all Fair Trade fishers, the traders did not see the added value of structurally extracting information to complete the logbooks. Respondents indicated that duplicating records on a template that is not directly useful to their practices did not make sense. Second, the format of the logbooks varies substantially from the A5 notebooks and traders preferred their way of recording information. Third, the logbook forms contained data elements that traders do not have access to, particularly the information about fishers' interactions with ETP species at sea. Respondents indicated that they did not feel completing the logbooks was their responsibility as they did not have access to all the information.

MDPI in its second attempt introduced a "transport note" upon which traders were asked to write down the volume, weight, and grade of Fair Trade and non-Fair Trade loins in the iceboxes transported to the buyer factory. At the factory, the transport note and the loins are handed over to the buyer staff who transfer the loins to the factory where information about incoming volumes from the different traders are recorded.

The introduction of the transport note was readily incorporated into existing sets of practices, see step 4 of Figure 3. This was because it reduced the discrepancies between trader and buyer records that occasionally led to disagreements between these two actors. Furthermore, the transport notes offered traders an alternative means to identify Fair Trade products. One trader indicated, "In high season I sometimes do not do the coding if there are high catches, instead I note down the volumes of Fair Trade on the transport note and send it." This saved the trader time doing the coding and transferred the responsibility for Fair Trade product identification to the buyer who has record systems that can easily record Fair Trade-related information.

Third, MDPI piloted OurFish, a mobile phone-based application that they thought would supplement the transport note by making recordkeeping easier and quicker for traders in the face of increasing information demands. Traders were asked to input the weight, grade and price information for each loin into OurFish during pre-processing and the payment and loan repayment information while conducting business with fishers, see steps 3 and 5 of Figure 3. Based on inputted data, the application automatically consolidates expenditure and revenue information per fisher per day.

However, the OurFish application was not rolled further out for three reasons. Several technical glitches meant that there were several instances where data inputted by the trader was saved to a wrong date, thus aggregating data in incorrect ways and reducing trust in the application. The increased accuracy of financial records imposed by the application also conflicted with informal agreements with fishers, including

implicit margins for the traders in some cases. Finally, while conducting business with fishers does not always occur daily, the application creates records of daily expenses and revenues. This meant that the trader had to go back into the application to edit this information which was more time-consuming than writing the information down by hand. Ultimately the trader prioritized the A5 notebooks over OurFish and provided access to MDPI and auditors for Fair Trade auditing.

Discussion

The two cases illustrate the response dynamics emerging from both public and private traceability interventions in remote tuna landing sites that supply international markets that are demanding greater transparency on where, when and how tuna is caught. By examining how interventions impact on the performance and embeddedness of a range of targeted and non-targeted social practices between fishing and processing in these value chains, we identified three orders of intervention response dynamics that correspond to changes in performance and embeddedness in targeted practices, non-targeted chain practices and non-targeted non-chain practices (summarized in Table 1). Together these orders of intervention response dynamics offer a clearer picture of whether and how interventions are accepted, rejected or in some way adapted.

First, the traceability interventions show that the integration of new informational demands into existing targeted practices is more effective when aligned to one or more practice elements. The relative ease with which obtaining the SKPI was incorporated into the obtaining permit practices is a case in point. This resulted from the specialized skills of traders to adapt routines to ever-changing regulatory demands. Conversely, the logbooks and the OurFish app were less successful because of conflict with the goals or the material realities of pre-processing practices. As might be expected, interventions

Table 1. Key response dynamics to traceability interventions.

Intervention characteristics (co)determining response dynamics	Description	Examples from the Indonesian cases
1. (Mis) alignment of the intervention with targeted chain practices.	Direct integration of new informational demands into existing targeted chain practices are effective when properly aligned to one or more targeted, chain practices and their elements.	Competences and skills to navigate bureaucracy as part of the obtaining permit practice enabled the incorporation of SKPI.
2. (Mis) alignment of the intervention with non-targeted chain practices.	Direct integration of new informational demands into existing targeted chain practices are effective when properly aligned to one or more non-targeted, chain practices and their elements.	Sense of urgency to maintain quality of tuna loins is shared by targeted post-harvest and pre-processing practices and non-targeted transport and processing practices which led to the initial rejection and negotiation of the Fair Trade product identifiers.
3. (Mis) alignment of the intervention with non-targeted, non-chain but interlinked practices	Direct integration of new informational demands into existing targeted chain practices can or cannot support and be reinforced by linkages with non-chain but interlinked social practices.	The social organization of non-targeted practices of payment and loan repayment determined the rejection of the OurFish app as a replacement to the A5 notebooks maintained by traders.

were not taken up where elements of existing practices were not recognized or taken account of. However, the cases also show that practices are constantly evolving (Shove, Pantzar, and Watson 2012) and thus can adapt to changing demands. This can be seen in how certain tasks and functions are dismissed by those immediately targeted by the intervention, such as fishers but are instead incorporated into existing practices performed by traders.

Second, the results also demonstrate that the performance of non-targeted chain practices was at least as important as those of the targeted practice. Successful interventions were based on the alignment of materials, goals or competencies with initially non-targeted practices and actors. Most consistently, it was the alignment of targeted and non-targeted practices, and most notably the shared goals of fishers and traders, that led to the co-constitution of new or adapted traceability practices (Schatzki 2002). For instance, the high demand and perishability of the tuna organize the performance of the practices of landing, (pre-) processing, storage, and transport. While not explicitly the focus on the traceability interventions, the shared sense of urgency in the performance of these (at least initially) non-targeted practices determined which interventions were a success and which were not. Building on the observations made elsewhere in tuna value chains (Doddema et al. 2018; and beyond, see Walker 2014), this indicates that any attempt to change targeted practices also have to negotiate the rhythm and time-space characteristics of non-targeted practices.

Third, the results demonstrate that any successful traceability intervention is embedded in and determined by a wider set of routinized social practices that relate to but extend beyond the flow of fish and information along value chains. These wider set of practices include the social dynamics of power and trust that constitute the wider every-day social existence of fishers and traders. The two cases demonstrate this most clearly through the sets of practices enacted by traders that simultaneously produce and reify their role as patrons within value chains and communities (as commonly seen in other coastal communities in Indonesia, see Kusumawati, Bush, and Visser 2013; Ferrol-Schulte, Ferse, and Glaser 2014; Pauwelussen 2015; Warren and Visser 2016; Nurdin and Grydehøj 2014; Miñarro et al. 2016). Traders adopt practices to coordinate the flow of information in addition to their more traditional services of providing credit and a range of social services, including healthcare and education, to maintain their centrality in the everyday life of their communities. As illustrated, they even managed to maintain this role despite the Fair Trade USA certification attempts to diminish these dependencies (see Bailey et al. 2016 for more details). While this does not mean that traders are the only way forward to implement traceability, any alternative approach needs to understand the full suite of social practices that traders perform within communities that affect trade and transparency.

The three levels of response dynamics demonstrate the value of a social practices approach to understanding and shaping interventions like traceability in remote landing sites.

Common to all of these response dynamics is their representation of continual social processes that underlie the success of both public and private traceability interventions. The cases demonstrate that traceability interventions are not one-off events, but are instead evaluated in terms of their alignment to and impact on the goals of existing

targeted and non-targeted practices. Returning to the social practices intervention framework introduced in the theory section of this paper, it is precisely the moments of de-routinisation, when practitioners are forced to consciously reflect on their practices, that meanings, the use of materials, competences, and goals are evaluated and, if necessary adapted (Spaargaren 2011). For example, the negotiations following from the rejection of the Fair Trade coding intervention resulted in fishers paying the traders from the Fair Trade premium despite the Fair Trade goal of empowering fishers to take on new roles traditionally performed by traders. Understanding the response dynamics can allow for clearer identification of when and how uptake or rejection of interventions takes place, as well as enabling a wider understanding that informational changes require ongoing engagement by those seeking the change in the first place.

Finally, despite the differences between public and private traceability schemes, both face similar kinds of barriers and constraints to implementation as seen through a social practice lens. Public and private schemes can, therefore, benefit from an understanding of micro-level changes to existing sets of practices in response to the interventions they entail. We argue that the social practices intervention framework used to analyze these cases can not only help to understand these micro-level changes and the response dynamics emerging from changes in the performance and embeddedness of target and non-target practices, but also assist in the design of these interventions.

Conclusion

This paper has introduced the social practices intervention framework as a novel approach for understanding and assessing the uptake and impact traceability interventions in socially embedded contexts. By applying the framework to remote tuna landing sites in Indonesia we identify three orders of response dynamics that help to specify legitimate and effective traceability interventions. All three orders of response emphasize the dependence that successful interventions have on their alignment with existing practice elements of materials, rules, norms, competencies, and goals. Combined, they demonstrate that the success of traceability interventions is not only dependent on alignment with the targeted practices within value chains, but also on alignment with non-target chain practices and non-target-non-chain practices. As a consequence, traceability should be designed with a clear understanding of the embedded nature of landing, trade, and processing practices in a wider set of everyday sayings, doings and relations that influence how both fish and information flow through value chains.

The social practices approach has been applied to analyze social change related to technology interventions in a variety of fields but is only starting to be used in fisheries and seafood trade. Further application of this approach to production, trade, and consumption, therefore, holds considerable scope for understanding behavior change in global seafood value chains. Building directly on the results of this paper, further research could focus on responses to traceability in other nodes of seafood value chains, including processing and retail. By developing a whole-chain understanding of how traceability is adopted, adapted or rejected a more precise picture of whether and how market-based governance instruments can effectively steer change toward transparency, legality or sustainability goals is put forward.

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Appendix A. Semi-Structured Interview Topic List

N.B. the topics and questions were slightly adjusted and a selection of questions was made for each respondent.

Intervention characteristics

The same questions were asked for the EU IUU regulation and Fair Trade USA certification

- Who demands that you comply with the intervention(s)?
- By whom and how are required changes related to the intervention communicated to you?
- Why do you (not) comply with demands and what would be the consequences of not complying with these demands?
- What do you have to do differently to comply with the intervention?
- What were initially the main challenges to complying with the intervention and how has this changed over time?

- Besides yourself, who else is involved in complying with the intervention and what is their role?

Value chain & landing site relations

Each respondent was asked the following questions regarding their relationships with the following groups of actors: (1) those that tuna is sourced from, (2) those that tuna is sold to, (3) competitors, (4) government officials, (5) NGOs and (6) other relevant actors identified

- Could you describe where and how often you interact with this actor?
- What is the main goal for these interactions?
- Do you collaborate with this actor in relation to the intervention?
- Could you describe the nature of the relations you have with those you buy from and sell tuna to?

Identification of practices relevant to response dynamics

Each respondent was asked several questions to identify the relevant sets of practices that are affected by the interventions and that organize behavior in the two landing sites.

- What does a normal working day look like currently and what did it look like before (and/or during different iterations of) the intervention?
- How did the intervention change what you do during a day?
- Where are different activities done (including interactions with other actors) and when do these occur during the day?
- How often are there changes in what you do during a normal working day and what causes these changes?
- Are the other weekly, monthly or seasonal activities that are affected or affect the uptake of the intervention?

Changing performance and embeddedness of identified practices

For each practice identified, the following topics were covered during the interview

- What materials do you need to do practice X? Have there been changes in the materials used over time?
- What skills or knowledge do you need to do practice X? How do you learn how to do this?
- What are the main goals of practice X?
- What does doing practice X entail?
- Are there certain conditions or rules that determine how practice X is done?
- Do others do practice X the same way as you do, or are there differences? If so, what are these?
- Before you can do practice X, what things have to be done?
- What happens to the tuna or information after practice X is completed?
- Are there other activities that occur in the same place when practice X is being done?

Based on answers to these questions, additional questions were asked to gain an in-depth understanding of the response dynamics.