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# Multi-tier captive relations in the global value chain of tuna: The case of Fair Trade certification of small-scale tuna fishery in Indonesia

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ABSTRACT

Voluntary sustainability standards have been used as a governance mechanism to ensure the sustainability of fisheries products traded from developing countries. Different standards have become market forces that actors along the value chain are expected to follow to access markets and remain competitive. Recent attention is also being paid to small-scale fisheries, but there is relatively little information about the efficacy of the translation of standards by all actors in the value chain. This study examines how a voluntary sustainability standard is translated from an international buyer down to the producer and the effectiveness of this on social and environmental sustainability. The global value chain (GVC) modular framework is applied to assess the implementation of and compliance with the standard. The analysis is done at the micro, meso, and macro levels. We use the first-ever Fair Trade USA certification for handline small-scale tuna fishery in Maluku, Indonesia, as our case study. The findings indicate that the captive forms of governance prevailing at the micro and meso levels of the value chain vary considerably. This adds a layer of complexity to the extent to which a sustainability standard changes the structure and governance of the value chain. The efficacy of such changes in promoting social and environmental sustainability is constrained by the unequal power dynamics among the various actors operating at the different levels. The findings from this study may contribute to optimizing the value chain for greater sustainability outcomes by involving local actors and accommodating various governance mechanisms to organize the value chain.

## 1. Introduction

Seafood certification has emerged as a significant approach to regulate the sustainability of fisheries products traded globally (Stoll et al., 2020). Certification standards define a set of criteria about sustainability, which the actors in the value chain are expected to adhere to (Gereffi and Korzeniewicz, 1993; Humphrey and Schmitz, 2000; Mitchell and Coles, 2011a; Oosterveer et al., 2014). In return for following these guidelines, the certification scheme provides a market-based incentive to the actors in the form of higher prices and access to attractive markets to compensate for their efforts in fisheries production and management improvement (Blomquist et al., 2015; Gudmundsson and Wessells, 2000; Roheim et al., 2018). Despite these potential benefits, the uptake of such schemes remains limited and relatively slow-paced in developing countries, although approximately 60% of fish traded globally is sourced from there (Gutierrez et al., 2016; Nyiawung et al., 2021).

Meanwhile, certifications have been criticized because they tend to favour well-managed stocks, which questions the impact of such certifications on improving the sustainability of global fisheries, especially small-scale fisheries in developing countries. The end markets are limited to niche groups of consumers with high environmental awareness. While the image of small-scale fisheries as having a lower environmental footprint than large-scale fisheries has created a positive image (Le Manach et al., 2020), most seafood consumers worldwide cannot discriminate between seafood without ecolabelling (Constance and Bonanno, 2000; Jacquet and Pauly, 2007; Philips et al., 2008).

Fisheries value chains that involve small-scale fisheries are often lengthy and complex. While there may be integration between exporters and the global market, the upstream chains are typically fragmented. The level of small-scale fishers and local traders often has its own governance mechanism, where local control, rules, norms, and knowledge are significant (Bronnmann et al., 2020; Bush and Oosterveer, 2007; Purcell et al., 2017; Tran et al., 2013). This complexity at the upstream end of global value chains presents a challenge for certification schemes, besides the lack of fishers' technical knowledge, capital,

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and asymmetric information (Stratoudakis et al., 2016). Thus, organizing sustainability certification among small-scale fishers must consider these unique challenges to ensure that positive impacts are distributed among all actors involved.

So far, there is relatively little evidence published on organized seafood value chains with voluntary sustainability certification schemes involving small-scale fishers. Previous studies have examined how the seafood chain in developing countries is linked to consumers in developed countries through the governance of commodities and information (Bush and Oosterveer, 2007), the governance of fisheries chains through specific standards on food safety and quality (Nguyen and Jolly, 2020; Tran et al., 2013) and different driving actors and mechanisms of selected aquaculture value chains (Jespersen et al., 2014; Ponte et al., 2014). The main argument in these studies is that the governance of seafood chains is not only arranged by internal value chain actors taking part in production, processing, and marketing but also by external value chain actors (Jespersen et al., 2014). Considering the challenges in implementing standards in developing countries, a better understanding of actual practices and the movement of goods and information within chains involving small-scale fishers and local actors is needed.

The GVC governance theory aims to understand how geographically fragmented global value chains are coordinated and how relationships between actors are organized (Gereffi, 2005). Given the rise of globalization and trade liberalization, GVC theory has gained significant importance as a tool to analyze international trade (Dicken, 2007). The GVC framework facilitates analyzing the coordination and management of dispersed economic activities and identifying the opportunities and challenges for developing and developed nations (Gereffi, 1994; Sturgeon and Lester, 2003).

The literature on GVC governance suggests that the integration of various dispersed economic activities in international trade is not a natural occurrence, but driven by specific actors (Gereffi, 2005; Gibbon et al., 2008; Ponte and Sturgeon, 2014). These actors include internal actors involved in producing, processing, marketing, and retailing the final products and external actors who do not participate directly in such activities but are influential to the value chain. These external actors can possess significant power in shaping the value chain by deciding which actors are included or excluded, the methods and standards to be employed, as well as the pricing and the targeted consumers (Jespersen et al., 2014; Tran et al., 2013). Coordination along the value chain is not always a two-way process connecting the production to end-consumers nodes (Bush and Oosterveer, 2007).

In this study, we use the modular theory framework developed by (Ponte and Sturgeon, 2014), which comprises three analytical levels: micro, meso, and macro to analyze GVC governance. At the micro-level, we investigate how linkages are formed at each individual node of the value chain. At the meso-level, we examine the linkages between two different nodes. We focus on identifying the factors that work exclusively at the individual nodes and their transmission to the other nodes within the value chain. Finally, at the macro-level, we examine the main institutional actors and factors involved in the value chain to understand the whole-chain governance and, in particular, their interactions.

The linkage mechanisms of each node in a value chain are determined by three factors: the complexity of information required to secure a transaction, the ability of actors to codify this information, and their capacities to engage in value chain activities. These linkage mechanisms can be classified into five categories: market, modular, relational, captive, and hierarchy (Gereffi, 2005). Market linkages mean low complexity of information, and value chain actors engage in loose linkages while the value chain is governed by price. Modular linkages refer to high complexity of information codified through detailed instructions or standards, involving highly competent actors with sufficient capacities to secure the transaction. Relational linkages involve a high complexity of information, which cannot easily be codified due to personal or social factors such as trust and reputation. Captive linkages are characterized by a high complexity of information codified through detailed instructions or standards, but involving less competent actors so creating a one-way dependency on specific actors. Hierarchy linkages include one lead firm that takes control over other actors through vertical integration (Gereffi, 2005).

Finally, the whole chain can be characterized by the number of lead firms that drive it. Whole-chain governance is unipolar when it is driven by one lead firm or group of firms, bipolar when driven by two lead firms, and multipolar when multiple firms drive it. The degree of power that lead firms have in shaping the value chain is determined by their ability to define the terms of chain membership, to incorporate or exclude actors, and to allocate value-adding activities to actors within the chain (Gereffi, 1994; Ponte and Gibbon, 2005).

The main idea of a modular framework is that different governance mechanisms can occur at different nodes in the value chain and that whole-chain governance can consist of several layers of coordination (Dallas et al., 2019; Gereffi, 2005; Ponte and Gibbon, 2005; Ponte and Sturgeon, 2014; Sturgeon, 2008; Talbot, 2009). This is highly relevant for small-scale producers in developing countries where economic relationships are often embedded in social relationships. Due to the nature of small-scale production activities, the lack of technical knowledge and capital to process raw materials, and the fragmented nature of production and marketing sites, buyers depend on a relatively complex value chain and must interact with various actors, including local actors, to move products from production sites to consumers. Interactions among these different actors involve different governance mechanisms (Bailey et al., 2016; Crona et al., 2010; Nguyen and Jolly, 2020; Tran et al., 2013).

Captive linkages are often observed at the chain node involving small-scale producers primarily due to informal loan provision (Jespersen et al., 2014; Tran et al., 2013). Local traders or middlemen provide these loans to small-scale producers (Islam et al., 2020, 2023). The coordination with local actors is often beyond the control of the buyer. As a result, the governance mechanism is fragmented through factors that work at a specific micro or meso level. This adds complexity to GVC governance as it entails various forms of power and enhanced dynamics between local and global levels (Bush and Oosterveer, 2007). Additionally, market incentives promised to small-scale producers may not be transferable since each trader has costs and generates profit, resulting in lower prices for small-scale producers (Tran et al., 2013).

This study, therefore, aims to investigate how a voluntary sustainability certification scheme is dealt with by all actors along the value chain and whether the resulting changes in the structure and governance of the value chain contribute to social and environmental sustainability. We use a case study of Fair Trade USA Capture Fisheries Standard (FT USA CFS) certification for small-scale tuna fisheries in Indonesia and use the framework of the Global Value Chain (GVC) analysis.

## 2. Method

The FT USA CFS-certified tuna value chain was selected as a case for this study. In 2014, the FT USA CFS began certifying small-scale tuna fisheries in Indonesia, particularly those located in Buru and Seram Islands, making it the first project of its kind for small-scale fishers worldwide. The FT USA CFS focuses on social empowerment, economic development, and environmental sustainability (Seafish, 2023). The target catch is yellowfin tuna (*Thunnus albacares*). The certificate holder and buyer is Anova Food, which sells the final products to the United States (U.S.) market. An Indonesian NGO, *Yayasan Masyarakat dan Perikanan Indonesia* (MDPI), is appointed and financed by the buyer as the implementing partner of the certification scheme.

Data was gathered between June and August 2023 through twenty-five semi-structured interviews with key informants and relevant policy makers along the certified value chain in Indonesia, including seven middlemen, two representatives from the processor, a representative from the exporter, six representatives from MDPI, two representatives from certifications, three government representatives from the

Indonesian Ministry of Marine Affairs and Fisheries (MMAF), three representatives from an association, and a representative from Indonesia's National Commission on Fisheries Resource Assessment. The informants were selected based on their specific roles in the value chain and the institutional framework. Due to accessibility, we limited our interviews to the exporter based in Indonesia. The buyer and the retailers were excluded from the analysis.

Data was analysed qualitatively, building on the modular GVC framework. First, the value chain was mapped, followed by identifying the actors in each node and calculating the economic performance of the value chain. This calculation included the Total Gross Marketing Margin (TGMM) and the percentage of gross marketing margin received by each actor (GMMn). The TGMM is the difference between the price paid by the consumers and the price paid to the certified fishers (farm-gate price). GMMns were also calculated at each node of the value chain as a percentage of the TGMM. Calculating the TGMM is important for evaluating the market performance of the value chain (Aliyi et al., 2021). Due to confidentiality issues, we could not access the selling price at the processor's level. Therefore, the GMMns were only calculated from the processor down to the certified fisher, and the TGMM was calculated based on the retail price of FT USA-certified Natural Blue Ahi Tuna Steaks in the U.S. The following formula was used to calculate the TGMM (Scott, 1995):

$$\text{TGMM} = \frac{\textit{Price paid by consumers} - \textit{Price paid to producers}}{\textit{Price paid by consumers}} \text{ x } 100\ \% \quad (1)$$

$$\text{Fisher's GMM} = 100\ \% - \text{TGMM} \quad (2)$$

$$\text{GMM}_n = \frac{\textit{Selling price at node}_n - \textit{Purchasing price at node}_n}{\textit{Price paid by consumers}} \text{ x } 100\ \% \quad (3)$$

Where:

TGMM: total gross marketing margin.

$GMM_n$: GMM at each value chain node.

The second step was analysing the forms of governance in each node (micro-level analysis) based on linkage mechanisms. Third, we analysed the factors in each node that are transmitted to another individual node in the value chain (meso-level analysis). Fourth, we identified the

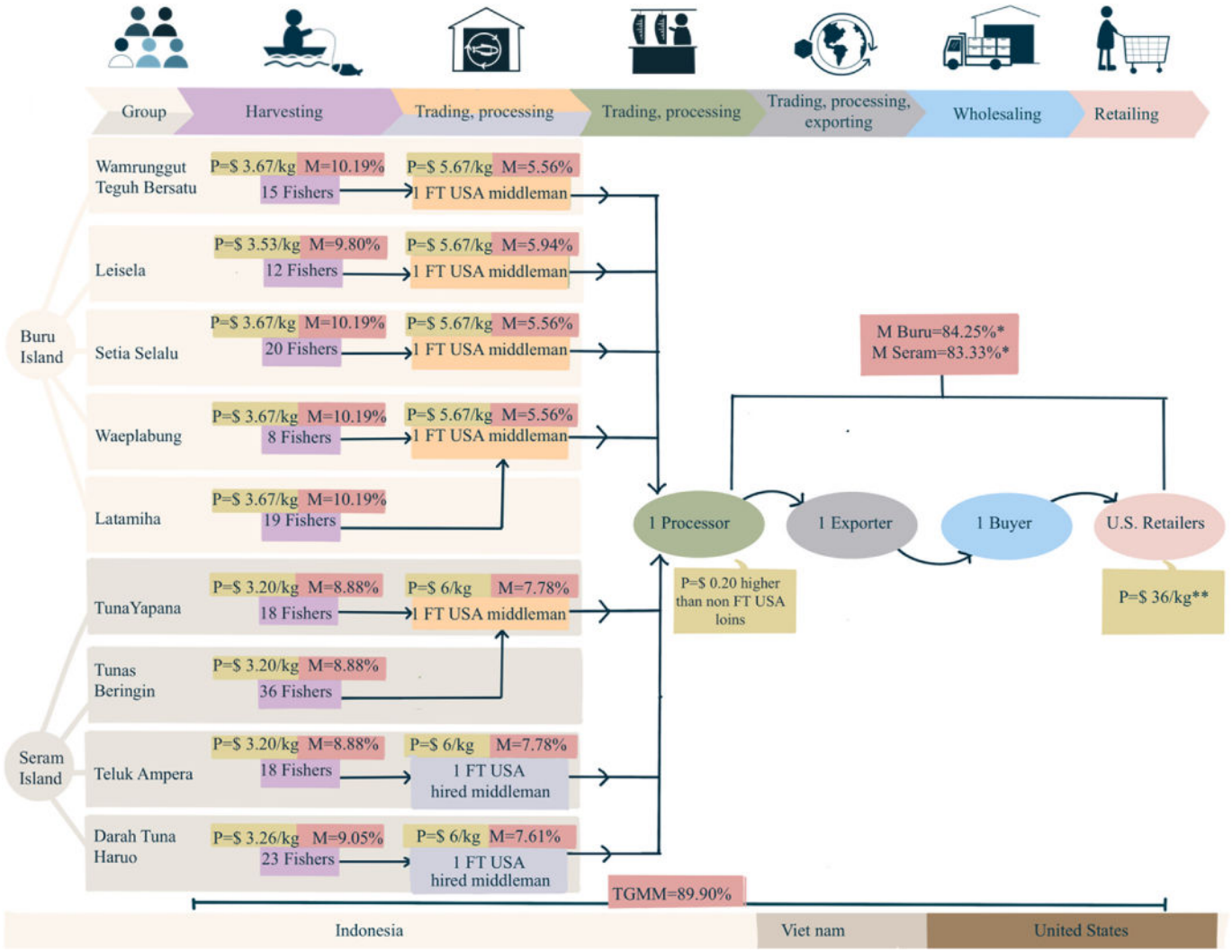


**Fig. 1.** The FT USA tuna value chain mapping.

Note:The local purchase prices at the fishers' level were between IDR 48,000–55,000/kg, and at the middlemen's level, were between IDR 85,000–90,000/kg, where USD 1 ≈ IDR15,000 at the time of fieldwork in 2023.*The purchase prices at the processor's level were unavailable due to data confidentiality.**The price of FT USA-certified Natural Blue Ahi Tuna Steaks in the U.S. can reach $12.69 for a 12 oz (340.2 gr) pack (https://www.instacart.com/products/3370455-natural-blue-ahi-tuna-steaks-wild-caught-12-oz).

P= Price, M= Margin

Source: Author's elaboration based on interview data

institutional actors and factors and their influences on the value chain. Fifth, we analysed the governance of the whole chain by identifying the (group of) firms that drive the value chain. Finally, we integrated the different steps to explain the overall governance of this small-scale tuna fisheries' value chain.

## 3. Results

### 3.1. Mapping the value chain

All certified fishers participating in the FT USA certification scheme are small-scale, with vessels between 1 and 2 gross tonnage (approximately 8 m long), operating around the Indonesian Fisheries Management Areas (FMA) 715 and 714. Their main catch is yellowfin and skipjack tuna, and they use handline fishing gear called "tasi". Certified fishers participate in groups but manage their trading individually through registered middlemen. They sell their tuna as rough loins, obtained by removing the fish's head and tail, gutting its organs, and cutting it into four pieces while keeping the skin intact. The fisher groups later receive premium funds based on the amount of fish sold to the buyer. The map of the value chain, including actors, flow of products, prices, and margins, is presented in Fig. 1.

There were seven registered middlemen during the period of this study, classified into two types. First, independent middlemen who receive their price from the processor and set the price for the certified fishers according to their costs and associated profits. Second, FT USA hired middlemen who operate in the same manner but do not set prices. Instead, they receive a fee of Rp 1000/kg ($0.15/kg) of loins supplied to the processor. Certified fishers may also sell their catch to unregistered middlemen when the registered middlemen offer unfavourable prices. This practice is rather common among the fishers on Seram Island. There is no specific period when the middlemen offer unfavourable prices.

In the middlemen's mini plants, an employee removes the plastic fish bags that wrapped the loins, cleans the loins, removes some skin or bone, weights the loins, places the loins in new plastic fish bags, writes down the date, the fisher's name, the fisher's group code, the loins' number, and the FT USA code. The clean loins on Buru Island are transported to the PT Harta Samudera processing plant. As no processing plant is available on Seram Island, the clean loins are transported to a processing plant in Ambon.

At the processing plant, the loins are processed further. The processing involves grading, trimming, and weighing. These data are recorded electronically using Tracetales, a tally system developed by MDPI and funded by USAID Oceans, to ensure traceability of the loins. The semi-final frozen loins are delivered to the Coral Triangle Processor (CTP) for export to Vietnam, where the loins are further processed and repackaged into final products. Both Anova Food and CTP are subsidiaries of Bumble Bee, a prominent North American seafood company.

During the interview, the purchase price of rough loins at the fishers' level ranged between $3.20 and $3.67/kg, which indicates that fishers' GMM ranged between 8.88% and 10.19%. The middlemen received a lower GMM than fishers, ranging from 5.56% to 7.78% (Fig. 1). This percentage accounts for collecting, processing rough loins, and trading clean loins with the processor. Finally, within the whole value chain, the highest GMM was earned at the loop between the processor, exporter, and buyer nodes (85.58%), which illustrates the distribution of power between this loop and the rest of the value chain actors (Table 1).

**Table 1**
Total gross marketing margin and margin at individual nodes.

| No | Value chain actors | Average prices ($/kg) | Percentage (%) |
|---|---|---|---|
| A | **Certified fishers** | | |
| | Selling price of rough loins | 3.45 | 9.58 |
| | **$Margin_n$** | **3.45** | **9.58** |
| B | **Registered middlemen** | | |
| | Purchasing price of rough loins | 3.45 | 9.58 |
| | Selling price of clean loins | 5.19 | 14.42 |
| | **$Margin_n$** | **1.74** | **4.84** |
| C | **Processor-Exporter-Buyer-Consumers** | | |
| | Purchasing price of clean loins from the middlemen | 5.19 | 14.42 |
| | Selling price of steak loin to consumers | 36 | 100 |
| | **$Margin_n$** | **30.81** | **85.58** |
| **Total GMM** | | **32.55** | **90.42** |

Source: Author's calculations based on interview data

### 3.2. Micro-level analysis of value chain governance

In our study, we observed that the most dominant form of coordination at the micro level is captive (Fig. 2). This form of coordination at different micro-level governance of the value chain shows differences in the degree of interdependency of value chain actors compared with other actors in its individual nodes. Although characterized by the captive mechanism, the actor who controls each node and how much control is exercised is context-specific for each node.

The first captive relationship exists between certified fishers and middlemen because the FT USA standard requires fishers to participate in groups in the certification program, which means that the complexity in the specification process of the fishers' loins is high. However, the complexity of loin specification at the fisher's level is low because they do not determine the fish's grade nor write the loin code. Thus, at the fishers' level, there is no difference between certified and non-certified loins. Certified fishers sell their loins to registered middlemen, either independent or hired. For those who sell to independent middlemen, the coordination of this node is beyond the control of the processor. Meanwhile, for those who sell to hired middlemen, the coordination of this node is controlled by the processor and the fisher groups.

Secondly, informal pre-financing of the fishers provided by independent middlemen, particularly for buying fuel for vessels, produces a captive relationship. The independent middlemen also provide informal credit to tackle other urgent financial needs. Of the hired middlemen one claimed never to provide informal pre-financing to the fishers, while another provided pre-financing similar to independent middlemen.

Thirdly, a captive relationship also becomes apparent in the dependency of fishers on the middlemen's processing activities. The processor demands clean loins, which forces the fishers to rely on the middlemen's mini plants for processing. A similar relationship also applies to other nodes, including middlemen not registered in the FT USA certification scheme, selling their loins to the same processor. The fishers in Buru depend on middlemen's trucks to ship the fish to the processor's plant, although it is located on the same island. Meanwhile, as Seram Island has no processing plant, fishers' dependency on middlemen to ship the loins is even higher.

Fourthly, although the fishers are well-informed about their position in the export-oriented value chain, the prices for loins are mainly determined by the middlemen, making the fishers price takers. Fishers who sell their loins to hired middlemen can choose to sell rough loins and get paid directly or sell clean loins and wait for the middlemen to sell them to the processor, which will take four to five days before getting paid. This practice points to a modular relationship, where middlemen act as intermediaries facilitating transactions between the fishers and the processor. The processor pays the middlemen based on the weight of loins supplied. Market coordination occurs when fishers sell their loins to independent middlemen and the price explains why fishers choose to do this. The loins are not tagged with the FT USA code even though the middlemen sell them to the same processor, and ultimately, they are not included in the calculation of the groups' premium fund.

A captive relationship is also observed at the next node between the FT USA middlemen and the processor due to the provision of physical assets, including mini plants, fish boxes, tables, and regular supplies. These assets are given at no cost except for ice and fish plastic bags.

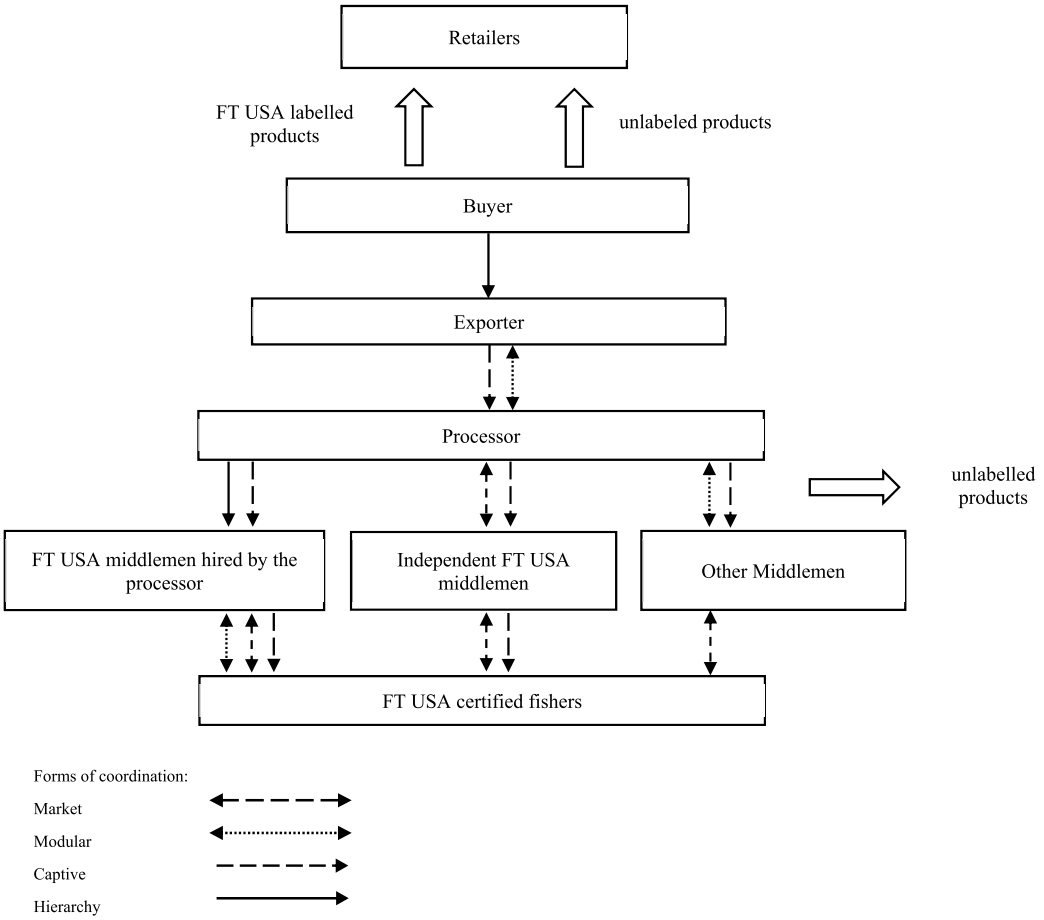


**Fig. 2.** Forms of coordination of the FT USA certified small-scale tuna fisheries value chain in Indonesia.

Furthermore, the processor can offer informal pre-financing to the middlemen, allowing them to pay the fishers in advance. There is no written agreement, and payment is made when the middlemen sell the loins to the processor. The hired middlemen, who receive their payment from the processor, function within a hierarchical relationship.

At this node, the information complexity is high and is codified by writing codes on the fish plastic bags. Although independent middlemen are not employed by the processor and may engage in market relationships, they are still subject to high switching costs due to the significant physical assets provisioned by the processor. The processor offers a supplement of Rp 5000/kg ($0.3/kg) above the price of uncertified loins, and provides fish handling and processing training to all middlemen. The non-FT USA middlemen have two methods to interact with the processor. The first method, captive coordination, entails the processor providing physical assets such as mini plants to ensure continued sales of loins. The second method, modular coordination, involves no capital contribution from the processor to the middlemen.

In the downstream value chain, the processor is linked to the exporter through a captive relationship. The buyer bears the cost of all FT USA certification activities. As a result, the processor cannot sell the certified loins to other buyers, making switching to a new buyer expensive. The complexity of the information exchange is codified through the training and assistance provided by MDPI.

Despite the financial investment made by the buyer, the relationship between the processor and the exporter is also modular. The processor's capabilities are high. The company has exported tuna to various countries since 2008, and in 2012, it joined the buyer program of Fishing & Living, which marked the beginning of their relationship. In addition, to meet the FT USA standard requirements at the processor's level, the company had to invest in several internal improvements at its own expense. Nevertheless, as reported by the processor, non-certified loins still account for a larger proportion than FT-certified loins. For instance, in 2022, the total amount of non-certified loins entering processors was 313,556 kg, while the amount of certified loins was only 170,804 kg.

### *3.3. Meso-level analysis of value chain governance*

#### *3.3.1. Transmission between fishers and middlemen and between middlemen and the processor*

The captive relationship between the certified fishers and middlemen (a/b) is transmitted to the node of independent middlemen, hired middlemen, and the processor (d/e). The middlemen provide financial and physical capital to the fishers, while the processor offers similar support to the middlemen. The way in which the middlemen codify product specification through loin codes is not transmitted down to the fishers since no loin coding activity was expected from the fishers. However, this changes at the node between the middlemen and the processor since the middlemen (d/e) add value by loin cleaning activities in their mini plants.

There is limited transmission of information between fishers and middlemen (a/b) and between middlemen and the processor (d/e). The processor provides information about fish quality to certified fishers through direct training in fish handling. This training is conducted once every six months or once a year, with fisher groups participating in turns. Except for the fish handling training, coordination at the node of fishers and middlemen is beyond the processor's control as the fishers have no direct access. However, the processor has a written agreement with the middlemen on being their supplier. MDPI is monitoring the fulfilment of the certification standard and provides information on how to write codes at the node between the middlemen and the processor.

The cost of switching suppliers is high for both nodes since failure to meet certification standards at a single node can result in a similar failure at the next level. This can lead to actors or products being uncertified.

When certified fishers sell their fish to unregistered middlemen, the product specifications and codification according to the certification standard are not transmitted. As a result, the end products are not tagged with FT USA, which means they cannot be sold at a premium price (Table 2).

#### 3.3.2. Transmissions between middlemen and the processor and between the processor and the exporter

The captive relationship at the middlemen-processor node (d/e) is also transmitted to the processor-exporter node (g). The processor is obliged to supply the FT USA-tagged loins only to the exporter as agreed in a contract. The exporter has no direct control over the loins' production at the fisher's level and over the coordination between the processor and the middlemen. The product specification at the processor-exporter node is transmitted and codified to the middlemen-processor node, requiring intensive information exchange between them. Tracetales is implemented at the processor-exporter node, while the middlemen still write codes manually on the plastic fish bags. This seamless coordination between both parties enables effective monitoring and intervention, ensuring that the produced goods meet the agreed quality standards and can be traced back to the fishers.

However, there is only limited information transmitted between the exporter, processor, and middlemen. For instance, due to unfavourable market conditions, the buyer stopped purchasing certified loins twice for several months. During these periods, the processor sold untagged loins and received lower prices from the exporter. However, the processor still had to pay the higher tagged loin prices to the middlemen, incurring additional costs. This decision was made to maintain existing coordination and participation at both the processor-middlemen and the middlemen-certified fishers' nodes (Table 2).

#### 3.3.3. Transmission between the processor and the exporter and the exporter and the buyer

The captive and modular relationship at the processor-exporter node (g) is not transmitted to the exporter-buyer node (h). The vertical integration between the exporter and the buyer makes both companies the certificate holders of FT USA in Buru and Seram Islands. This type of coordination exists because the processor depends on the buyer's financial investments. The information exchange between individual nodes is highly codified and facilitated by the implementing partner. The ability of actors to supply products according to the standard is coordinated by different actors at each individual node (Table 2).

### 3.4. Macro-level analysis of value chain governance

Actors internal and external to the value chain have influenced Indonesia's FT USA tuna-certified value chain. An internal actor, an international buyer, initiated the certification scheme, while an external actor, FT USA, set the standard for the actors involved in the certification scheme. The government did not directly participate in or intervene in the implementation of the scheme.

The governance of the whole certified tuna value chain is multipolar and includes the international buyer, the certification body and MDPI. The chain is driven by the international buyer, who identified a niche market in the U.S. with demand for high product quality ensured through certification. The certification body developed the standard to allow for certification. The buyer recognized the potential of sourcing raw materials from small-scale fisheries in Indonesia and invested considerable financial resources in the project. However, all technical assistance was provided by MDPI. This NGO played a crucial role in translating the certification standard into a format that could be implemented on-the-ground in Indonesia. Moreover, the NGO's capabilities in building and maintaining relationships with all relevant other institutional actors have benefitted the value chain actors, especially at the fishers-processor nodes.

MDPI's abilities to engage with various actors have remarkably impacted the governance of the value chain. Through a memorandum of understanding with the Indonesian MMAF, they established a system for reporting their activities and data to the government. This well-maintained relationship has enabled them to overcome regulatory barriers faced by small-scale fishers, such as obtaining Fishing Vessel Registration Certificates required for certification. MDPI has initiated logbooks for small-scale fisheries to meet the requirement of the certification standard. These logbooks include a fisher log to document the fishers' fishing trips, while the endangered, threatened, and protected (ETP) species log tracks the interaction between fishers and ETP species during their fishing trips. An official regulation about the standard for logbooks for small-scale fisheries in Indonesia was released only in 2021 through Ministerial Regulation No. 33.

Although not officially mandated by the government, the data gathered through the fisher logbooks is uploaded to the Indonesian Fisheries Information System (I-fish) database belonging to MDPI but made accessible to the government. MDPI also employs its own data collection system using port sampling. The data has been used to support the government, for instance, through the Indonesia Tuna Catch Estimate Workshop (ITFACE) workshop on estimating tuna catch figures reported to the Western and Central Pacific Fisheries Commission (WCPFC). To further promote effective fisheries management while supporting the implementation of the certification scheme, MDPI initiated the establishment of the Fisheries Co-Management Committee (FCMC) as a multi-stakeholder collaborative forum (Table 3). The buyer has also implemented FT USA certification in the Fisheries Improvement Project (FIP) areas since 2012 through its corporate responsibility program of Fishing & Living, which aims to support sustainable fisheries for Eastern Indonesian yellowfin tuna fishery.

Nevertheless, the supply of certified loins is still vulnerable to fluctuating market demands, as the certified products are only marketed in the U.S. market. As a response, there is a decreased interest from the processor in continuing the FT USA-certified product trading activities and higher interest in other certifications, such as the MSC, which allows access to different markets in the European Union. The success of MSC certification in certifying small-scale fishers and the support available from the certificate holder, the Indonesian Pole and Line and Handline Fisheries Association (AP2HI), has also contributed to this growing interest.

## 4. Discussion

In this study, we found that the FT USA tuna value chain was organized through institutional frameworks involving a range of actors and specific transactions of products and information. The captive form of governance dominates relationships at micro and meso levels. These relationships are characterized by high degrees of dependency in terms of financial and physical capital (Bailey et al., 2016; Islam et al., 2020, 2023; Jespersen et al., 2014; Tran et al., 2013). Those capitals are used to exert control over the coordination of activities. This finding contrasts with previous studies by Smith and Barrientos (2005) and Raynolds (2009) who suggest that Fair Trade usually incorporates relational and modular forms of governance. In our case, the captive mechanism exists particularly because the value chain involves small-scale producers and middlemen, who depend on each other through capital and supply mechanisms within the certification scheme. Moreover, the certification standard is expected to be followed by the producers, while small-scale fishers are characterized by limited access to capital, assets and low entrepreneurial skills (Xu et al., 2023). To ensure they have the capacities to follow the processes and specifications and comply with the standard, the lead firms highly depend on other value chain actors, including local actors. This interdependency leads to captive

**Table 2**
Summary of the main coordination mechanism at the micro and meso levels of the value chain.

| Indicators | Micro level | | | | | | | | Meso level | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Certified fishers-Independent Middlemen (a) | Certified fishers-Middlemen hired by the processor (b) | Certified fishers-Other Middlemen (c) | Independent middlemen-Processor (d) | Middlemen hired by the processor-Processor (e) | Other middlemen-Processor (f) | Processor-Exporter (g) | Exporter-Buyer (h) | Factors that are transmitted between individual nodes | | | | | |
| | | | | | | | | | (a)–(d) | (b)–(e) | (c)–(f) | (d)-(g) | (e)-(g) | (g)-(h) |
| Product specification | Low | Low | Low | High | High | High | High | High | X | X | ✓ | ✓ | ✓ | ✓ |
| Process specification | High | High | Low | High | High | High | High | High | ✓ | ✓ | X | ✓ | ✓ | ✓ |
| Codification | High | High | High | High | High | High | High | Vertical integration | X | X | ✓ | ✓ | ✓ | ✓ |
| Information exchange | Low | High | Low | High | High | High | High | | X | ✓ | X | ✓ | ✓ | ✓ |
| Buyers input | High | Low/High | Low | High | High | Low/High | High | | ✓ | X/√ | X | ✓ | ✓ | ✓ |
| Buyers monitoring and intervention | Low | Low | Low | High | High | High | High | | X | X | X | ✓ | ✓ | ✓ |
| Switching cost | High | High | Low | High | High | Low | High | | ✓ | ✓ | X | X | X | ✓ |
| Linkage | High | High | Low | Low | High | Low | High | | X | X | X | X | X | ✓ |
| Explicit coordination to buyers | High | High | Low | Low | High | Low | High | | X | X | X | X | X | ✓ |
| Actor's capability | High | High | High | High | High | High | High | | X | X | X | ✓ | ✓ | ✓ |
| **Forms of coordination** | Captive, Market | Captive, Market, Modular | Market | Captive, Market | Captive, Hierarchy | Modular, Captive | Captive, Modular | Hierarchy | (Captive, market) →(Captive, market) | (Captive, market, modular)→ Captive | Market→ (Modular, Captive) | (Captive, Market)→ (Captive, Modular) | (Captive, Hierarchy)→ (Captive, Modular) | (Captive, Modular)→ Hierarchy |

Note.
X: The coordination level at the micro level is not transmitted to the meso level.
√: The coordination level at the micro level is transmitted to the meso level.

**Table 3**
Summary of whole-chain governance and institutional framework (IF).

| No | Categories | Institutional actors or factors | Main driving mechanisms |
|---|---|---|---|
| 1 | International trade regulation and policies to the U.S. market | Quality and safety certifications | Quality and safety requirements for fish or fish products that are exported to the U.S. market |
| | | Traceability program (Seafood Import Monitoring Program requirement) | Traceability requirements for fish or fish products that are exported to U.S. market |
| | | Marine Mammal Protection Act | The agreement resulting from the G2G trade partnership between Indonesia and the U.S. prohibits Indonesia from exporting fish or fish products from commercial fishing operations that risk the incidental killing or severe injury (bycatch) of marine mammals |
| 2 | Domestic regulation and policies | Indonesian Ministerial Regulation No. 121 of 2021 concerning management plans for tuna, skipjack, and tuna fisheries | National plan for tuna fisheries management |
| | | Indonesian Ministerial Regulation No.10 of 2021 concerning licensing standards for marine and fisheries business activities and products, and Ministerial Regulation No. 58 of 2020 concerning capture fisheries business activities | Regulating vessel registration for small-scale fishers with vessels less than five gross tonnages |
| | | Indonesian Ministerial Regulation No. 18 of 2021 concerning the use of fishing gear | Regulating small-scale fishers' fishing equipment and FAD placement permits (In Indonesia known as SIPR) |
| | | Indonesian Ministerial Regulation No. 33 of 2021 concerning fishing logbooks, observers, transport vessels, inspections, and supervision | Regulating simplified national logbook standards for small-scale fishers |
| | | Law of The Republic of Indonesia No. 7 of 2016 concerning the protection and empowerment of fishers and aquaculture farmers, and Indonesian Ministerial Regulation No. 18 of 2016 concerning guarantees of protection against risks to fishers and aquaculture farmers | Regulating fishers' protection, including insurance for small-scale fishers |
| | | Law of The Republic of Indonesia No. 5 of 1990 concerning the conservation of natural resources and ecosystems | Regulating protection of ETP species |
| 3 | Key international actor and institutions | Anova Food, Donor agencies, FT USA CFS, SCS Global Services, International Social and Environmental Accreditation and Labelling Alliance (ISEAL), US Agency for International Development (USAID) | FT USA CFS certification governs the standard to ensure the quality and meet the demands for high-quality products |
| 4 | Key domestic actors and institutions | Indonesian NGO (MDPI) | The NGO prepares, implements, and assists all actors along the value chain to comply with the certification scheme<br>The NGO assists the FIP areas<br>The NGO has collaborated with various actors in supporting the certification scheme and sustainable fishing<br>The NGO initiated the FCMC |
| | | Indonesian MMAF through the Directorate General of Capture Fisheries and Directorate General of Strengthening the Competitiveness of Marine and Fishery Products, Marine and Fisheries Department of Maluku Province, Provincial government, District/city/village government | The government supports fishers' vessel registration, FADs, and legal permits the processor needs.<br>District/city/village governments also support the Fishery Management Plan of FT USA |
| | | FCMC | The committee involves various fisheries stakeholders in addressing various tuna fisheries issues |
| | | Indonesia Western and Central Pacific Ocean yellowfin tuna handline FIP implementer | The NGOs and associations exchange information about the data collection and management of yellowfin tuna fisheries, supporting the FIP and FCMC's funding |
| | | Indonesian Tuna Consortium | The NGOs exchange information about tuna fisheries data collection, management and support the harvest strategy |

relationships despite the nature of the sustainability certification scheme.

However, concluding that captive relationships are dominating is too simplistic to explain the coordination at different levels. According to existing literature (Casciaro and Piskorski, 2005; De Marchi et al., 2018; Gereffi et al., 2005; Schmitz, 2006), control within captive relationships is usually in the hands of the lead firm. Nevertheless, in this study, we argue that governance mechanisms at different levels have varying degrees of dependency and power imbalance. Each node at the micro level operates in its own context, with varying factors that shape relationships among actors, which are not always transmitted to the meso level of the value chain. This transmission mechanism has not been observed before, as most previous studies have focused on micro-level analysis (Jespersen et al., 2014; Tran et al., 2013).

We can classify the captive relationships into three categories. The first type is a combination of captive and hierarchy relationships. In this

arrangement, the buyer owns the upstream supplier, but the capital required for the process is placed under the management of the supplier. In our case study, this occurs at the hired middlemen-processor node. The processor provides physical and financial capital to control the middlemen and, consequently, to enable the fishers involvement in the certified value chain.

The second type is a mix of captive and modular relationships. In this relationship, buyers have great control, while suppliers have high capacities to meet their demands. The high costs for certification and market access have contributed to this combination, as Van Putten et al. (2020) suggest. In our study, this occurs at the processor-exporter/buyer node. There is a one-way dependency because the buyer bears the financial burden of preparing, implementing, auditing, and certifying the product. However, there is also a modular relationship at the same node because the processor is highly capable of meeting the exporter's requirements on the quality and safety of loins and the sustainability standard specified by the buyer. This strengthens the processor's position as a reliable supplier while also supporting the buyer's efforts to maintain a certified supply chain. This combination also applies to certified fishers and hired middlemen. Within this node, fishers still rely on middlemen to deliver their loins to the processor. However, since the middlemen do not generate profit from this activity, the groups and fishers have more power in determining the prices they receive.

The third type is a mix of captive and market relationships. In this type, buyers have a high level of control, but the price is determined by the market. We observed this combination at the certified fishers-independent middlemen nodes, as well as at the independent middlemen-processor node.

At the certified fishers-independent middlemen nodes, the participation of the fishers and the middlemen depends on the capabilities of their partner within each node to provide financial and physical capital. Our findings show that small-scale fishers cannot access formal credit due to the absence of collateral and a lack of direct pre-financing opportunities by lead firms. Thus, the fishers' interaction with middlemen is necessary to secure capital for fishing and accessing the market (Crona et al., 2010). Through this informal arrangement, the fishers are bounded by the social norm to sell their loins to the middlemen and repay the loans in doing so, which has become a mechanism to exert control over fishers to supply their loins within the certification scheme (Acciaioli, 2013). This is similar to the patron-client relationships familiar among small-scale fisheries in developing countries (Ferrol-Schulte et al., 2014; Johnson, 2010; Miñarro et al., 2016; Ruddle, 2011).

In addition, fishers also depend on the capabilities of the middlemen in providing physical capital in the processing stage of the value chain. As previously stated by Tran et al. (2013), it is common in developing countries that fishers' fishing activities and their landing sites are located far from processing companies with poor physical infrastructures. This means that lead firms cannot rely entirely on the domestic processor and need to involve the middlemen in the process.

At the independent middlemen-processor node, our findings show that the participation of the middlemen within the certification scheme also depends on the capabilities of the processor in providing financial and physical capitals. Soundararajan and Brammer (2018) and Villena and Gioia (2018), state that the lower tiers of suppliers with multiple-tier supply relationships often have difficulty complying with sustainability issues. However, in our study, we found that for all suppliers, particularly fishers and middlemen, compliance is also due to captive mechanisms. This mechanism may undermine the need for the lead firm and the certification scheme to link fishers closer to the processor, which contrasts with the goal of promoting economic and social improvement of small-scale fisheries.

Successfully implementing voluntary sustainability standards requires a varied approach to the organization of value chains. This study reveals that sustainably certified value chains do not differ significantly from conventional value chains structured as multi-tier value chains (Haack and Schoeneborn, 2015). Furthermore, our findings are not entirely aligned with the suggestion by Ponte and Sturgeon (2014) that different governance mechanisms can occur within the value chain. Instead, we observed that multi-tier captive relationships exist with distinct mechanisms at the micro and meso levels. The central question arising from this observation is how such fragmented relationships affect efforts to achieve social and environmental sustainability throughout the value chain. Our study confirms that the sustainability goal of certification is shared through multi-tier captive relationships within the value chain. Each tier has its captive mechanism for implementing the sustainable certification standard at the next tier level.

As observed before (Bush, 2004; Bush and Oosterveer, 2007; Kusumawati et al., 2013), we also found that middlemen play an essential role in the certified value chain which lead firms cannot easily replace. Although the presence of middlemen appears to reduce the margin earned by fishers, their involvement provides benefits for the fishers, who cannot perform the value-added activities themselves, be part of the value chain and comply with the certification scheme. Therefore, instead of removing the intermediaries from the certified value chain to connect the fishers directly to the market, as argued previously by Bair and Gereffi (2003) and Mitchell and Coles (2011), our findings support Bailey et al. (2016) and Islam et al. (2020) that under sustainability certification, their involvement is critical in providing a way to include small-scale fishers in the certification scheme (Schmitz, 2006). Thus in order to support small-scale fishers access, certification has to consider the context of their production and marketing activities, as previously raised by Bush and Oosterveer (2007), Ponte and Gibbon (2005), and Sturgeon (2008).

While we agree that there has been significant improvement in product, process, and functional upgrading through the standard, such locally embedded value chains that are bounded by captive relationships can also tie the small-scale fishers and local actors into asymmetric power relations that discourage the fishers from accessing more rewarding positions. For instance, even though small-scale fishers supply tuna loins under the certification scheme, they receive relatively low margins compared to the other value chain actors (Penca et al., 2021; Purcell et al., 2017). This locks the certified fishers into a power relationship that remains unchanged and maintains the power imbalance between upstream and downstream actors (Adhuri et al., 2016; Penca et al., 2021; Ponte et al., 2023).

In other words, we agree with Ponte and Ewert (2009) that in this way, sustainability certification can only facilitate a part of the social performance of small-scale fishers. For environmental sustainability performance, we agree that at the micro and meso levels, the standard specifications have mainly contributed to the traceability of the tuna origin. However, aside from that contribution, decisions over the sustainability of their activities are beyond their control and largely tied to other powerful actors and dynamics at other nodes.

In support of Schmitz (2006), we found that the governance of the value chain at the upstream nodes is subject to dynamic changes over time. We observed that the middlemen who are linked vertically to the processor have shared considerable power with the fishers and that fisher groups have improved their capabilities to receive higher prices, which indicates a shift into a more modular relationship. To achieve this, the fishers are required to be financially strong because payment by the processor takes some time while fishers need the money directly to cover their fishing costs for the upcoming days. Alternatively, money can be facilitated through the fisher groups, as Amarasinghe and Bavinck (2011) have suggested which is possible through a specific positive investment in group capabilities. In this setting, functional upgrading within the chain is possible to improve the fishers' ability to decide on the product and process specification (Gereffi, 1999, 2005).

Captivity at the micro and meso levels is transmitted to the macro level. Multiple parties govern the whole value chain. It is characterized by a high level of control exerted by the international buyer through its implementing partner (Humphrey and Schmitz, 2000; Jeppesen and Hansen, 2004). Control is exercised through the demand for high-quality

certified products and the standard set by voluntary sustainability certification bodies. This way, the lead firm has contributed to changes in the fishers', middlemen, and processors' attitudes toward social and environmental performance (Ponte and Gibbon, 2005). Financial investments made by the international buyer is the primary source of its power because certification costs can be burdensome for the actors in the value chain (Tran et al., 2013). In the case of FT USA certification in Indonesia, domestic institutional actors have shown no interest in underwriting the costs. Insufficient funding in the future will likely have a negative impact on the ability to sustainably upgrade and promote small-scale fisheries through certification. While other certification schemes may emerge to address environmental and social concerns, the primary challenge for small-scale fisheries remains the financial investment required for their implementation. From a business perspective, high investment costs may also create a power imbalance associated with asymmetric informational exchange between actors. Therefore, more research is needed to understand the role of voluntary sustainability certification schemes in the sustainability governance landscape of small-scale fisheries and how our findings on multi-tier captive relationships resonate with the governance of small-scale production in other food sectors.

## 5. Conclusion

Our research emphasizes the importance of involving local actors and allowing them to exercise their governance capabilities for successfully certifying small-scale fishers in developing countries. This approach to govern value chains has resulted in multi-tier captive relationships, enabling all actors to develop capabilities to participate in the certified value chain and gain market access. Despite this successful locally embedded governance approach, power imbalances remain a formidable obstacle for transferring market incentives to these fishers because the captive mode is dominating the governance mechanisms, thereby limiting the impact from voluntary sustainability certification.

FT USA has achieved a significant milestone by becoming the first voluntary sustainability certification scheme granted to Indonesian small-scale fishers. However, the ability of FT USA to scale and provide benefits to these small-scale fisheries remains uncertain. The success of MSC certifications in certifying small-scale fisheries in Indonesia and the growing support from domestic institutions for this certification scheme may limit FTUSA's expansion.

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The authors declare no financial interests related to the material in this manuscript.

## CRediT authorship contribution statement

**Puspi Eko Wiranthi:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Conceptualization. **Hilde M. Toonen:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Peter Oosterveer:** Writing – review & editing, Supervision, Methodology, Conceptualization.

## Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Puspi Eko Wiranthi reports financial support was provided by Indonesia Bangkit Scholarship (BIB), a joint scholarship program between the Indonesian Ministry of Religious Affairs and the Indonesian Endowment Fund for Education (LPDP). If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

The authors do not have permission to share data.

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