

Does International Environmental Certification Change Local Production and Trade Practices? A Case Study of Shrimp Farming in Southern Vietnam

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Abstract

Studies on international environmental certification (IEC) have primarily focused on how certification can sustainably "upgrade" local production and trading practices. However, not many studies view this market-based governance process from the perspective of local practices and location-specific factors. This study therefore examines how the upstream of the local supply chain influenced global interventions through the case of certification for shrimp farming in the mangroves of southern Vietnam. To clarify various aspects of these interactions, semi-structured interviews were conducted with the provincial government, NGOs, a trading company, shrimp farmers, and middlemen. The results revealed that IEC did not affect local production practices and only partially influenced trade practices. The implementation of IEC was thus at the mercy of the robustness of local society, which was attributed to unique agroecology, production systems, and upstream customary economic practices.

Keywords International environmental certification \cdot Shrimp farming \cdot Upstream of supply chain \cdot Local robustness \cdot Vietnam

Introduction

International environmental certification (IEC) is a global institution that aims at the sustainable use of natural resources and the establishment of sustainable supply chains by promoting eco-labeled products that meet certain environmental and social criteria and are certified by a thirdparty organization.

IEC emerged from the perspective that public regulatory frameworks do not achieve the desired results in protecting natural resources and guaranteeing the safety of imported food (FAO, 2011). Therefore, IEC is regarded as private

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² Institute of Academic and Research, Okayama University, 2-1-1, Tsushima-Naka, Kita-Ku, Okayama-Shi 700-8530, Japan governance that complements state institutions. As global actors, international NGOs have worked on the implementation of IEC and led governments and companies to take action on it (Johansson, 2014; Ivancic & Koh, 2016).

IEC has three main characteristics. First, the credibility of the products is guaranteed by a third-party organization. IEC establishes a scientific basis, legality, neutrality, audit transparency, and traceability. Second, IEC is a voluntary system without legal force. Third, it adopts market principles. The success of the scheme depends on the voluntary participation of actors in the supply chain, from production to consumption (Omoto, 2016).

Institutionally, IEC is expected to achieve the following points: First, it can complement public measures (FAO, 2011). When natural resources are traded internationally and the environmental problems associated with those resources are widespread internationally, it is difficult to solve them through regulations at the national level (Omoto, 2016). Second, certification can provide exporting countries with access to Western countries that demand environmentally friendly products. Exporting countries are beginning to strategically address IEC to increase brand equity and secure markets (Leonidou et al., 2015). Third, producers can receive environmental and economic benefits if they meet the standards of IEC (Omoto, 2016). Thus, IEC intends to provide benefits to all stakeholders.

Against this background, many researchers have studied how IEC works for sustainable development, especially its impact on local farmers. Some studies have clarified the desired outcomes in line with IEC's vision (Takahashi & Todo, 2014; Ibanez & Blackman, 2016; Nesadurai, 2018). For example, Nesadurai found that private interventions helped support the upgrade of smallholders in the anarchical zone, where state governing is limited, toward yield-enhancing and sustainable farming practices (Nesadurai, 2018).

In contrast, there is a skeptical view of the global institution. Some studies have shown the interventions' negligible environmental or economic impact on farmers (Blackman & Naranjo, 2012; Jena et al., 2012; Baumgartner & Nguyen, 2017). Insignificant premiums are one reason for this. For example, in their analysis of coffee production under shade trees, Perfecto et al. (2005) showed larger tree shades cause lower coffee productivity. Sufficient price premiums are required to overcome the negative trade-offs.

These empirical studies show that the IEC system's design and practice determine its impact on local communities. Studies have examined how systematic improvements could address institutional problems and which farmers and regions are more likely to obtain certification (Hajar, 2013).

Existing studies discuss how IEC implementation is in the form that the implementation itself is a premise for achieving sustainable development. These studies tend to portray local communities as targets for IEC introduction. In other words, these studies argue that local communities should change to be in line with global standards.

However, is the tone of this argument correct? Several research findings cause suspicion. First, although IEC is a voluntary institution, governments are increasingly regaining control over private environmental governance while it is being implemented (Lambin & Thorlakson, 2018). Giessen et al. (2016) found that state bureaucracies have a strong influence on certification initiatives in Indonesia, and that the state is reshaping private initiatives into statedriven ones. Because of this, IEC can also be understood as a means to increase forces.

Second, Hatanaka (2014) criticizes IEC for being built on Western notions of rationality and reason, which clash with local culture, and suggests that this cultural difference obstructs the implementation of an organic shrimp project in Indonesia. Such northern initiatives reproduce global inequalities through the imposition of bureaucratic and industrial conventions on southern producers (Raynolds, 2004). These studies indicate that IEC is an institution based on Western ideas and bureaucratic logic.

Thus, the introduction of IEC can be interpreted as an attempt to bring local practices under state control and to

Westernize them. Is this approach of trying to change local communities effective in achieving sustainable development? For example, Tovar et al. (2005) mentioned that the ways in which the government utilizes IEC can be a catalyst for social disparities between large and small producers, suggesting that trying to change a community to conform to global standards can have a negative impact on the community.

From this perspective, Raynolds (2004) criticizes how certification is a new form of strong network governance rooted in social, legal, and bureaucratic institutions. Therefore, understanding how local communities respond to such global interventions and how this affects governance is necessary (Scott, 2009). In this study, we explore how market-based governance is formed from the perspective of local actors, namely farmers and middlemen, who comprise upstream supply chains. We will investigate aspects of interactions between global and local actors and eventually consider what formed governance means to each actor.

More specifically, this study has three objectives: (1) To examine how IEC changed local production and trade practices. In particular, we examine the strategies that global actors used to involve local actors. These global actors include provincial governments, NGOs, and trading companies. (2) To investigate the characteristics of local production and trade practices, and how these local customs influenced the implementation of IEC. We examined how shrimp farmers and local middlemen, which comprise upstream supply chains, responded to the institution. (3) To consider, based on the results of the above objectives, what kind of governance was formed, and for whom. What has governance brought to each actor? Is it a desirable outcome? We address these research questions.

We selected the mangroves of southern Vietnam as a case study. The study site was located in a peripheral area that was a frontier until the 1970s. We considered this area a suitable case study for investigating the interactions for two reasons. First, because of the recent introduction of IEC for shrimp farming. Second, local production and trade systems based on unique geographical conditions may influence IEC implementation, as shown by previous studies in other mangrove areas (Omoto, 2012).

The remainder of this paper is organized as follows. "Methodology" explains the study's methodology, drawing on Scott's research perspective to investigate aspects of the interaction between IEC and local society. "Framework" discusses the survey, analysis, and description of the research site. "Results" presents our results. "Discussion" presents a discussion, where we examine the factors that make local societies robust based on the results of IEC impacts on local production and trade practices. Finally, in the conclusion, we show the implication of global private governance for each actor and mention that the introduction of IEC is gradually reforming upstream relationships in existing supply chains.

Methodology

Framework

This research will discuss the meaning of establishing market-based governance from the standpoint of local actors in mangroves. This idea was inspired by Scott (2009) as follows.

Scott examined the relationship between state spaces and extrastate spaces in the highlands of Zomia and shed light on local tenaciousness against the state. By seeing the process of state formation from the viewpoint of hill tribes, he made the novel suggestion that the highland peoples had intentionally become "savage" to maintain their freedom and autonomy. He argued that the hill tribes are not "preanything," even though they are often regarded as primitive tribes although in civilization discourses (p. 338).

By following his idea, this study approaches the question of whether bureaucratic and Western concepts of IEC, which more or less represent modern state and market initiatives, penetrate into local communities in a quasi-frontier area by studying the interactions between IEC and the local community. When examining these interactions, attention is paid to local customs that result from their specific locations. In other words, we investigate the values that local actors use as the basis for their response to IEC.

Findings of existing studies (Foley & Hebert, 2013; Omoto, 2012) suggest that local social contexts and geographical conditions influence IEC implementation. For example, Omoto (2012) clarified that the relationship between farmers and intermediaries affected the success of organic shrimp projects in Vietnam, finding that the excessive dependency of farmers on intermediaries that was caused by geographic conditions made the project weak. This means that existing local relationships affected global efforts to establish environmental governance. It has been also reported that existing political economies of governance, production, and trade in generating specific geographic and political scales have created alternative regimes for external interventions in Alaska (Foley & Hebert, 2013). This means that locals established own local environmental governance.

Because of this, local communities might react to IEC based on their values and affect its implementation rather than being changed by it. To understand local values, we examined specific location-based production and trade systems. First, we describe a shrimp farming system that relies on a mangrove agroecosystem that has persisted since frontier settlement times, and we examine the relationship between this system and IEC. Second, we describe the structure of the customary economy as a local trade system. In existing economies, poor countries have borne the costs of environmental problems (Shafik, 1994), and IEC is a market-based system globally designed to internalize such external costs. In contrast, people in peripheral areas live in a customary economy: A local economy in which people living in a particular area depend on each other through customs (Hiwatari, 2004). For IEC to be established, it must be linked to the customary economy through some means, as long as it is based on the market economy theory. We explain how the global market and customary economies can be integrated.

Survey and Analysis

This study explored organic certifications for shrimp farming in mangroves of southern Vietnam. Semi-structured interviews were conducted with the Department of Agriculture and Rural Development Ca Mau (DARD), NGOs, trading company A,¹ 18 certified farmers, and 5 middlemen. Interviews were conducted in February 2017, March 2017, August 2019, September 2019, and March 2021. The main question for each actor was as follows: The question of DARD and NGOs concerns the background and purpose of introducing IEC for shrimp aquaculture, institutional design, and its role in promoting IEC. The question of Company A concerns reasons to work on IEC and strategies to involve local actors in the institution to collect certified shrimp from them. Shrimp farmers' questions concern farming methods, relationships with middlemen, and changes after institutional implementation. The question of middlemen concerns their business content, strategies to maintain relationships with farmers, and sales destinations after the introduction of IEC.

The research site is Village V,² Ngoc Hien district, Ca Mau province, which is the southernmost area of Vietnam. The land area of Village V is 12,663 ha, of which 5,739 ha are forest areas, with a population of 14,448 (3,261 households). The main industries in the village are shrimp farming and forestry. Village V is a swampy area with the largest mangroves in Vietnam and is designated as a forest area by the Vietnamese state. Therefore, although shrimp farmers are allowed to practice shrimp farming, they must conserve mangroves until more than 60% of the shrimp pond area contains mangroves. Since 2013, DARD, NGOs, and trading company A have been cooperating to work on IEC in Village V.

¹ The name of trading company is anonymized.

² The research site is anonymized.

Results

Historical Overview of the Study Site and Background of IEC Implementation

Until the end of the Second Indochina War, most of Village V was covered by mangroves. The wetland was used as a military base and evacuation site (Hong & San, 1993). Since the 1980s, mangroves have been converted into shrimp ponds by immigrants (Van et al., 2015). Local forest officers (FMB) could not control the development of immigrants or manage mangroves themselves. Therefore, the local government began allocating land to residents by permitting their existing land use, forcing them to engage in mangrove conservation from the mid-1990s. Residents were involved in forest management under a subcontract with the FMB.

Simultaneously, the government had begun to develop shrimp aquaculture through an export program in 1987. Vietnamese Government Decision 347-CT supported the conversion of land to shrimp ponds (Ha & Bush, 2010). In 1999, a zoning plan for mangrove forest reforestation in the Mekong Delta was approved by the prime minister. This decision lowered the percentage of forest area in shrimp ponds that people must protect from 75 to 60% (Minh et al., 2001).

However, this development plan caused further mangrove deforestation. In this context, the Rehabilitation of Mangrove Forest Project (RFMP) with the aid of the Dutch government began in the Mekong Delta. This project aims to develop the silvo-fishery model for shrimp farming in mangroves. RFMP collaborated with the Coastal Wetlands Protection and Development Project funded by the World Bank and implemented the Coastal Belt Zoning Plan to establish a buffer zone along the coast (Clough et al., 2002). Furthermore, Ca Mau Province joined the Swiss Import Promotion Program to access the market in Switzerland and the EU in 2001. IEC for shrimp farming has been introduced (Ha & Bush, 2010; Omoto, 2012).

Efforts to implement certification have expanded, and recently, 10 trading companies have joined the IEC schemes in Ca Mau. Each shrimp farming area was allocated to a trading company so that they would not compete to buy certified shrimp. As of March 2021, the total shrimp farming area in Ca Mau is 300,000 ha. A total of 80,000 ha was used for mangrove-shrimp aquaculture, of which 12,000 ha was certified.

Six types of IEC were introduced in Ca Mau province, and each type had a different export destination. For example, there were four types of IEC for the EU: Naturland, EU Organic, Bio Suisse, and Selva Shrimp, and two types for the US: BAP and ASC. Certification brands vary from region to region depending on the production method. In Ngoc Hien district, Naturland, EU Organic, and Selva Shrimp were implemented. These brands were used extensively for shrimp aquaculture.

Intention of Each Global Actor

A staff member of the DARD provided several reasons as to why Ca Mau province worked on IEC. The first was to promote environmentally friendly aquaculture production methods and raise environmental awareness of the people involved in shrimp aquaculture. The second goal was to increase profits. The staff said that the trading price of certified shrimps was higher than that of non-certified shrimps. The third was to increase the reputation of shrimp produced in Ca Mau Province among foreign buyers. In fact, the staff said that when buyers from the EU visited Ngoc Hien District, they had a good impression of it.

Particularly, since 2013, in Village V, a Netherlandsbased international NGO (SNV) and the International Union for Conservation of Nature (IUCN) worked on IEC under the financial support of the German government. While the IUCN worked for policies on sustainable development in the coastal areas of the Mekong Delta, the SNV mainly played the role of a local coordinator. The SNV mentioned three reasons for its commitment to IEC: The first was to increase and conserve forests. For extensive shrimp agriculture, it is required that there be at least 50% of the forest area in shrimp ponds. The second goal was to improve farmers' economic status through premiums. The third was to support farmers in adopting climate change policies.

Company A is a major seafood-trading firm in Vietnam and is headquartered in Ca Mau. The company exports shrimp to over 45 countries. The main buyers were the United States and Japan. This company purchased shrimp from central Vietnam and the Mekong Delta. In addition to the scheme in the Ngoc Hien district, the company obtains various certifications such as ASC, BAP, HACCP, HALAL, and Global GAP in other areas. Company A regarded IEC as a global trend. The company needed to address IEC in order to enter overseas markets. Company A recognized that the transaction price of Naturland certified products was 2-3% higher than that of non-certified products. Therefore, Company A's main purpose was to increase profits by selling certified products. Company A considered the cost of IEC as a problem but thought it was worth working on IEC to increase earnings.

Design of IEC for Shrimp Farming in Village V

SNV, DARD, and Company A started to work on IEC in Village V with permission from the People's Committee of

Ca Mau. First, the target farmers in Village V were selected based on their ease in meeting the standards of Naturland, guided by the FMB. Group-based certifications were in place. There were 30 groups, and each group consisted of approximately 35–50 shrimp farmers. Inspections by third-party organizations were conducted once a year. If a farmer failed to meet these standards, only the farmer was removed from certification, and the entire group is not affected. Company A paid all costs of certification to farmers.

IEC is established when all certified actors in the supply chain conduct business with one another. Certified actors upstream of the supply chain are supposed to receive price premiums from Company A. The amount of premiums was decided based on the previous case in another area of Ca Mau province at the meeting held by SNV among representatives of farmers, DARD, and Company A. Certified farmers were supposed to receive 3,000 VND per kilogram of shrimp sold to Company A once a year. Certified middlemen were supposed to receive 1,000–2,000 VND per kg of shrimp sold to Company A each month. Although in the beginning the amount of price premiums for farmers was set at 5,000 VND per kilogram, it decreased to 3,000 VND due to a shortage in Company A's budget.

In addition to price premiums, certified farmers could receive payments for forest environment services (PFES³) from Company A, provided they sell at least 50 kg of shrimp to Company A annually. Farmers could receive 500,000 VND worth of shrimp seeds per hectare of mangroves that they conserve in their shrimp ponds. PFES in Ca Mau was the first aquaculture trial. DARD and SNV expressed their ideas that trading companies that buy shrimp from mangroves should pay for the efforts of the local people to conserve mangrove forests. SNV took the initiative to build the PFES for shrimp aquaculture with administrative support from DARD. In 2016, the activity was institutionalized as Decision 111/QD-UBND, with the approval of the Ca Mau Provincial People Committee.

Behind the SNV's commitment to IEC and PFES for shrimp farming was the central government's desire to expand the forest area. As Ngoc Hien district is designated as a forest area, shrimp farmers living there must conserve mangroves until they reach 60% of the forest ratio of the shrimp pond. However, not all farmers have met this requirement. Although farmers were empirically aware of the ecological benefits of mangroves for shrimp farming, too much forest in shrimp ponds reduced shrimp production. They hoped that land regulation of the forest ratio would be relaxed. Therefore, to achieve afforestation and forest conservation, SNV and DARD have started to provide economic incentives for farmers through these schemes. One DARD staff member explained why the central government is sticking to increasing forest area: "The reason is Vietnam has concluded an international agreement on environmental conservation, such as the United Nations Framework Convention on Climate Change."

How Did IEC Upgrade the Local Production Method?

Table 1 shows farmers' efforts to meet the standards of organic certification. Of the 18 certified farmers, only 4 farmers took action to meet the requirements. Their actions were to stop using medicines to kill wild fish in their ponds, plant mangrove trees, stop raising livestock, and build houses for livestock. It was not difficult for these farmers to satisfy these requirements. In contrast, the remaining 14 farmers did nothing and were only certified. This result indicates that IEC had little impact on local production methods and that shrimp produced in Village V was potentially "eco-labeled shrimp."

The reasons for this result include first, the selection of regions and residents who were more likely to meet the standards at the time of introduction; second, that Naturland is suitable for small-scale shrimp farmers (Bergleiter & Meisch, 2015), and third, that existing local production methods already met the standards.

Regarding the third in particular, extensive shrimp farming has been practiced, which can be interpreted as "organic farming" in Village V, since the development of the mangroves by migrants. Extensive shrimp farming in mangroves refers to the method that relies on local ecosystems. For example, in brackish water flowing through mangroves, farmers do not need to feed the shrimp because they feed on plankton. The water in the shrimp pond was replaced through a small sluice gate connecting the pond and the river using the ebb and flow of the tide. Farmers simply put young shrimp (postlarvae) into ponds, and shrimp grow naturally. Mangroves in shrimp ponds purify water, regulate

Table 1 Farmers' efforts to meet standards

Details of efforts	Number of respondents
Stop using medicine to kill fish	1
Replanting of mangrove trees	1
Stop raising livestock	1
Building houses for livestock	1
Nothing in particular	14

Prepared by authors from survey results in August 2019 and September 2019

³ Payments for forest environmental services (PFES) is a national policy aims to provide compensation for efforts by local people who manage forests, which are essential for the provision of ecosystem services.



Fig. 1 The structure of the existing supply chain for shrimp in Ca Mau. Source: Prepared by the author based on the results of interviews with DARD in February 2017. *The arrow indicates shrimp flow

water temperature, provide habitat for shrimp, and supply natural food.

What impressed one of the authors during fieldwork was that all farmers, whether certified or not, expressed that their shrimp were fresh and robust (being in good health) because they produced shrimp using farming methods that depended on the local environment. One middleman also said that there was no difference in quality between certified and non-certified shrimp.

These results indicate that shrimp farming in Village V originally conformed to Western notions, rather than IEC upgrading local production methods and farmers' environmental awareness to a global standard. Regardless of certification, local farmers seemed proud of their shrimp.

How Did IEC Affect the Local Supply Chain?

IEC is a voluntary institution. Company A needed to attract local actors to participate in it to collect shrimp from them and export them to the market for certified products. Company A attempted to establish a supply chain for IEC within the existing local supply chain by providing local actors with economic incentives.

Figure 1 shows the existing supply chain for shrimp in Ca Mau province. Shrimps were transported from a farmer to the global market through various actors such as middlemen, wholesalers, factories, and trading companies. Middlemen bought shrimp from farmers and sold it to wholesalers. The role of wholesalers in the village is to buy shrimp from middlemen and sell them to larger wholesalers, factories,



Fig. 2 Company A's strategy to collect certified shrimp in the beginning. Source: Field survey in February 2017. *The arrow indicates shrimp flow. The dotted line represents the premium flow. **The actors with a star mean that those actors are certified

or trading companies. The main job of factories was to peel shrimp shells to make them easier to handle as products and sell them to trading companies. Companies have the processing technology to respond to requests from global buyers and export them to the global market. More than 100 middlemen and seven wholesalers constituted the upstream of the supply chain in Village V. There were 32 factories and 24 trading companies at the provincial level.

Figure 2 shows the design of the supply chain for IEC at the beginning of institutional implementation. In other words, it was Company A's strategy. Company A asked farmers, middlemen, and three of the seven wholesalers in Village V to join the scheme. In 2014, 741 farmers, 35 middlemen, and 3 wholesalers were certified. By providing price premiums to these local actors, Company A attempted to collect shrimp.

As a result, in 2014–2015, premiums were paid by Company A to each certified local actor. In particular, approximately 500 farmers received a premium from Company A. This amounted to 600,000,000 VND in total. By performing a simple calculation, the average was 1,200,000 VND per household per year. The number of certified farmers has decreased to 553. According to Company A's testimony, 188 households were excluded from certification because of third-party organization checks during this period. The SNV responded that this was due to the farmers' failure to keep shrimp farming diaries and records of transactions with middlemen.

Furthermore, not all certified farmers received premiums from Company A. SNV and Company A said that this was because some farmers traded with non-certified middlemen. Additionally, not all households received PFES. Of the 553 farmers, 218 households received PFES. This amounted to 300,000,000 VND in total. Therefore, certified farmers were divided into three categories: those who received both the premium and PFES, those who received only the premium, and those who received nothing.

For this reason, Company A cited a limited number of certified middlemen buying shrimp from all certified farmers. In addition, the SNV also mentioned that local farmers tended to prefer middlemen whom they had continuously traded since before; however, certified farmers still had been dealing with non-certified middlemen.

First, certification did not mean that a trade contract was signed among the actors who joined the institution. Even if they were certified, they were still free to decide with which trading partner they wanted to trade.

Thus, it is understood that local actors live in a different principle of political economies from the expectations of global actors. Company A was forced to devise a new strategy for collecting more shrimp from certified farmers. Company A established its wholesaler in village V in February 2018. Although Company A initially did not intend to build it there due to high running costs, it eventually had no choice but to change its plan to connect business with a different world in which local actors live. This dynamism represents a counterattack by the local society against global interventions.

Figure 3 shows Company A's strategy from 2018. Company A planned to collect certified shrimp from its wholesalers. Company A's wholesaler needed to attract local actors to conduct business. To do this, Company A's wholesaler took measures such as setting higher prices than other wholesalers and paying money earlier than others or on the promised day.

How did Company A's second strategy function? According to Company A, 530 farmers and approximately 40 middlemen were certified in Village V in 2019. In 2018, Company A paid a total of 1,000,000,000 VND in premiums and



Fig.3 Company A's second strategy to collect certified shrimp. Source: Field survey in August 2019. *The arrow indicates shrimp flow. The dotted line represents the premium flow. **The actors with a star mean that those actors are certified

 Table 2
 How farmers choose their middlemen

Trading continuously with the same middleman	14
Basically, trading with the same middleman	4
(Sometimes trading with another based on price, size, and catch quantity)	
Constantly changing middlemen	0

Source: Field survey in August 2019 and September 2019

500,000,000 VND in PFES to approximately 900 farmers, including those in the adjacent village. A simple calculation shows that each farmer is paid 1,666,666 VND including bonuses and PFES. Company A said that it paid PFES even to those who did not sell more than 50 kg of shrimp for publicity to encourage farmers to sell their shrimp.

The above information was provided by Company A. However, the following are the results from the perspective of local actors. Of the 16 certified farmers,⁴ 3 farmers changed their middlemen before and after the introduction of IEC. These farmers started trading directly with Company A's wholesaler. Of these three farmers, two were farmers' group leaders, and one engaged in shrimp farming and being a middleman. The remaining 13 farmers had not changed their existing middlemen. Among these 13 farmers, six sold shrimp to Company A's wholesaler through their middlemen. Seven sold shrimp to other wholesalers via middlemen. These farmers left the choice of sales destination for their middlemen. Therefore, they did not intend to change their existing middlemen going so far as to sell shrimp to Company A's wholesalers.

This clarified that even after Company A's revised strategy, shrimp produced by certified farmers were still traded on the global market as non-certified shrimp. The finding that most certified farmers did not change their middlemen indicates that IEC had a limited impact on the existing local supply chain. Whether shrimp was sold as certified was still dependent on the upstream of the supply chain.

Local Trading Practices

Why did the upstream not change? This study investigated the structure of the existing local supply chain, that is, the relationship between farmers and middlemen. First, it focuses on how farmers choose their middlemen. Table 2 shows how farmers chose their middlemen. Of the 18 farmers, 14 traded continuously with the same middlemen. Whereas four traded with the same middlemen but sometimes traded with other middlemen based on price, size, and catch quantity. There were no farmers who constantly

⁴ Of the 18 certified farmers, it was not possible to track the sales destinations of 2 farmers.

Fig. 4 Histogram of transaction period between farmers and middlemen. Source: Field survey in August 2019 and September 2019. *If a farmer trades with two middlemen, the data reflects the transaction period of the main middleman. **Two farmers did not give specific numbers for the transaction period, and answered "long time," which is not reflected in the figure. ***For farmers who answered their transaction period was 2 or 3 years, the transaction period was calculated as 2.5 years



changed middlemen. The results reveal that farmers tend to continue trading with the same middlemen.

Second, this study examines the duration of transactions between farmers and middlemen. Figure 4 shows a histogram of the transaction period between them based on the farmers' answers. The longest transaction period is 24.5 years, and the shortest transaction period is 0.5 years. Farmers were found to have different criteria for selecting middlemen depending on the trading period.

The first concerns farmers who have been doing business with middlemen for less than three years. Seven farmers fell under this category. Their duration of transactions was shorter than that of the other farmers because they recently changed their middlemen because of the transaction price. Their criterion for choosing a middleman was mainly price. In particular, three farmers started to sell shrimp directly to Company A's wholesaler because of higher transaction prices and premiums. This indicates that, although it is a comparatively small number, the profits from sales to Company A attracted farmers. One farmer engaged in shrimp farming and being a middleman, and two farmers were group leaders. One group leader started to sell shrimp to Company A's wholesaler because of the higher transaction prices and proximity to the wholesaler. Before trading, he would often change middlemen based on price. He used to make a phone call to some middlemen and chose one middleman who showed the highest price. This farmer said that he was satisfied with the premiums and technical support from the wholesaler. According to this farmer, if necessary, the staff of the wholesaler will help check for production problems, such as shrimp diseases.

The other two out of seven farmers had been dealing with the previous middleman for 10 or 20 years. One of them said that he switched to a new middleman because the previous middleman set lower prices during the Vietnamese New Year holiday. According to this farmer, shrimp prices usually increase during this season. Another farmer said that he switched to a new middleman after receiving information on goods prices from another farmer. Thus, these cases show that, even if they have been trading for a long time, they may change middlemen depending on the price.

In contrast, farmers whose trading period was more than four years, including those who answered "long time," chose their middlemen not only by price but also by other criteria. In terms of price, farmers replied that their middlemen offered good prices for shrimp of all sizes and that there was no price difference with other middlemen. In addition to price, the other criteria are as follows: First, the middleman is a family member of a farmer. Five farmers had been trading with their brothers or relatives. The second is the honesty and kindness of the middlemen. Farmers state that the middleman must weigh the shrimp accurately and pay either immediately or on the promised date. Middlemen's personality can be an important factor for these farmers. The third factor was monetary support. Three farmers said that they borrowed money from middlemen to buy young shrimps (post-larvae) and clean shrimp ponds.

This indicates that their trade relationship was more than just a business one. Their relationship has been established not only by economic factors but also by social elements. This can be seen in farmers' statements. For example, farmer A has traded with his middleman for 20 years. This farmer believed that a trusting relationship was built by the accumulation of transactions. He stated that when considering switching to Company A, the key factor would be whether the company would pay premiums continuously and stably. He stated that it is important to be able to trust the people you deal with. He did not trust company A.

Middleman's ID	А	В	С	D	Е
Years of work experience (Unit: years)	15	14	15	10	20
Number of farmers trading (Unit: people)	40	70	40	20	20
Number of family members and relatives among them (Unit: person/people)	1 or 2	0	10	10	1
Transaction years with farmers (Unit: years)	15	14	10	10	20
Sales destination	BK	Mainly BA	Company A	VN	Company A
Transaction years with the wholesaler (Unit: years)	2	10	1	2 or 3	1

Source: Field survey in August 2019 and September 2019

^{*}The numbers given by respondents are approximate

**Names of other wholesalers are anonymized

Farmer B also traded with his middlemen for 20 years. According to this farmer, Company A explained to the farmer that it would pay premiums. However, Company A did not pay the premiums, as explained below. The farmer criticized the company for losing farmers' trust.

Farmer C had traded with his middleman for 22 years. He was satisfied with the prices. He considered his middleman a kind person. One day, a wholesaler from Company A visited his house and asked for a deal, but he refused the offer.

This study does not intend to reveal the truth of testimonies about Company A by farmers. However, credibility is an important criterion for selecting the trading partner. Including the condition that the middleman is a family member, the characteristics of the middleman, such as sincerity and kindness, seem to factor in trusting the trading partner.

However, one of the authors felt that most of the farmers, except the group leaders, did not have enough information on IEC. As some farmers were dissatisfied with Company A, there seems to be a gap between the farmers' understanding of IEC and the explanation provided by Company A.

Middlemen's Business Strategy

Table 3 shows general information on middlemen. Middleman A works only as a middleman, while the others work as shrimp farmers. Other middlemen started working to earn more money. Every middleman has worked for more than ten years. Each middleman's transaction period is as long as their work experience. Excluding middleman B, some of the farmers dealt with were in family or kinship relationships. Middleman B traded with many more farmers than the others. This was because the middleman was doing business with his wife and brothers.

Middleman A said that in the past, as there were few middlemen, it was common for farmers to bring shrimp to their homes. However, when he started working as a middleman, the number of middlemen increased, and middlemen began to visit farmers' homes to avoid losing their farmers to their competitors. This implies that farmers are not vulnerable to middlemen in power relationships in the supply chain.

Middlemen also tend to sell shrimp continuously to wholesalers. However, the transaction period with the wholesaler was not as long as the transaction period between farmers and middlemen, except for middleman B. Four middlemen have changed their sales destinations, mainly because of the price. Compared to farmers, middlemen can be considered more price-sensitive. In particular, as seen in the result that middlemen C and E began to sell shrimp to Company A's wholesalers, middlemen were drawn to Company A. They changed their sales destination to Company A's wholesaler because the wholesaler set a higher price and provided premiums. This indicates that IEC affected the middlemen. The middleman mentioned that because Company A was large in Vietnam, he felt secure and could sleep well every day.

In contrast, other middlemen prefer existing wholesalers. They continued to trade with existing wholesalers because they paid immediately or on the appointed day and weighed accurately. Therefore, the sincerity of business partners is also an important factor in determining who to sell to. Although it is not the aim of this study to clarify the truth, middleman A distrusted Company A because the company did not pay as many premiums as it explained at the beginning of IEC. Since then, Middleman A has refused to do business with it. While the relationship between middlemen and wholesalers can be described as mainly economic, this case shows that trust is also important for fostering such business relationships.

As shown in Table 3, each middleman had been dealing with many farmers for a long time. How have middlemen

Table 4 Middlemen's strategies to retain farmers

Middleman's ID	The way to retain farmers
A	To set good price based on the marketTo pay money immediatelyTo lend money without interest
В	 To weight shrimp accurately To set good price based on the market To entertain farmers through communication and interaction (parties and drinking)
C	 To set good price based on the market To lent money without interest To communicate frequently with farmers To buy every size of shrimp in main harvest season
D	 To lent money without interest To set good price based on the market To weight shrimp accurately To have enough communication with farmers through drinking beer or coffee
Е	• Only to set good price based on the market

Source: Field survey in August 2019 and September 2019

retained their farmers? Table 4 shows middlemen's strategies. Setting good prices based on the market is a common strategy. In addition to pricing strategies, there are various business strategies, such as paying money immediately, lending money without interest, and weighing accurately. For example, Middleman A paid money to farmers immediately and lent money to them without interest. According to this middleman, middlemen who do not have sufficient money often pay later. This may offend farmers if they want to pay immediately.

Furthermore, communicating often with farmers is another strategy. For example, middleman B attempted to entertain farmers by communicating and interacting with them through parties and drinking. This middleman said that the number of trading farmers is directly linked to income and that it is important for middlemen to make efforts to build good relationships with farmers. He also mentioned that if a good impression is made by the farmer, rumors can spread among the farmer, and new customers can be acquired. For this middleman, farmers were more friends than business partners, because they had been dealing with them for a long time.

> 1 2

According to middleman E, local trading customs exist. In practice, if a farmer harvests a larger shrimp, the middleman pays a bonus. Larger shrimp mean 1 kg for 10 shrimp and 1 kg for 15 shrimp. Normally, other middlemen would pay a bonus of 10,000 VND per shrimp for larger shrimp, in addition to the price of the shrimp. However, his farmers asked him for more bonuses, so he accepted them and paid a bonus of 15,000 VND per shrimp. This can be considered another strategy for retaining farmers.

From this result, it was understood that all middlemen took various steps to retain farmers. This is true, as middleman B mentioned, because the number of farmers dealing with it is directly linked to the income of middlemen. Therefore, middlemen must strive to maintain relationships with farmers. Daily exchanges with farmers deepened their relationships more than just businesses.

Market Information At the Local Level

Table 5 shows the shrimp prices in transactions between farmers and middlemen at the time of the 2019 field survey. Information on shrimp prices was provided by some farmers and middlemen and did not cover all respondents. Price information was organized by sales destinations: Company A's wholesalers and other wholesalers. Prices were set according to shrimp size. First, the prices quoted by middlemen selling to Company A's wholesaler were 403 K VND for 10 shrimps per kg, 243 K VND to 273 K VND for 20 shrimp per kg, and 103 K VND to 123 K VND for 30 shrimp per kg. Second, the prices quoted by middlemen selling to other wholesalers were 400 K VND for 10 shrimps per kg, 240 K VND to 300 K VND for 20 shrimp per kg, and 170 K VND to 200 K VND shrimp per kg.

These data show that the prices for 10 shrimps per kg were not different among wholesalers. However, the prices quoted by middlemen selling A were 3,000 VND higher because of premiums. In contrast, the prices for 20 shrimp per kg and 30 shrimp per kg quoted by middlemen selling to company A were lower than those quoted by middlemen selling to others, including premiums. It was found that selling certified shrimp did not result in higher profits

Table 5 Shrimp prices in transactions between farmers and middlemen

	Prices quoted by middlemen selling to Company A's wholesaler	Prices quoted by middlemen selling to other wholesalers
10 shrimp/kg	403 K	400 K
20 shrimp/kg	243 K~273 K	240 K ~ 300 K
30 shrimp/kg	103 K~123 K	170 K~200 K

Source; Field survey in August 2019 and September 2019

*Prices are for transactions between farmers and middlemen in August and September 2019

**Prices quoted by middlemen selling to Company A's wholesaler include premiums of 3,000 VND

than selling non-certified shrimp. There was not enough economic incentive for farmers to change their middlemen to sell to Company A's wholesaler or to change their sales destination there.

As a research limitation, we could not elucidate the reason why there was no significant difference in the prices of certified and non-certified shrimp. One possibility is that Company A bears all the costs associated with certifying shrimp farmers. In fact, company staff viewed the high cost of certification as a problem. In addition, Company A was required to pay for the PFES. It can be assumed that these large expenses may be attributed to the price of certified shrimp.

Discussion

The results show that IEC has less of an effect on local production and trading practices. It depended on the decision of local actors whether shrimp would be traded as certified. This result can be interpreted as global governance being at the mercy of local communities. In other words, the local community is still strongly against global actors. Why is the local mangrove community still strong? We consider the reason for this robustness in terms of local customs that result from the specificity of the location.

The first is the local production system. Shrimp farmers in Village V have practiced extensive shrimp farming that already meets the standards for organic certification, so there has been little change in production methods after IEC implementation. This result is not surprising, as previous studies have found (Omoto, 2012; Baumgartner & Nguyen, 2017). Rather, we found that regardless of certification, mangrove farmers were proud of the shrimp they produced as fresh and environmentally friendly. Although the state and NGOs aimed to raise farmers' awareness, farmers had already recognized the value of the environment because their extensive production depended on the mangrove ecosystem. This result is similar to Leroy and Garcia's (2021) results, in which local farmers understand the biological, economic, and sociocultural services of the environment, although they are unfamiliar with the term ecosystem services.

In addition to shrimp farming in mangroves, intensive shrimp farming is being conducted throughout the inland areas of Ca Mau. The fact that large corporations still want shrimp produced in mangrove areas means that the shrimp produced there is economically valuable enough for corporations to go out of their way to purchase them. If intensive shrimp farming had been practiced in mangrove areas as in inland areas, the value of shrimp might have been different, considering the transportation costs. As the staff of the DARD mentioned, shrimp produced in mangrove areas are highly valued by foreign buyers. The value of shrimp in Village V can be attributed to the unique farming system that relies on the agroecology of mangrove areas. In this light, it is understood that although small-scale farmers are often thought to have less political power, shrimp farmers in mangroves are not necessarily weak among stakeholders, and they are second to none.

The second explanation concerns local trading practices. The result that Company A could not establish a supply chain for certified shrimp as planned indicates that local actors have been doing business based on their own economic norms or customary economies. What kind of customary economy existed? Hiwatari (2004) argued that in Uzbekistan, during the period of economic transition, economic activities under traditional communities served as a safety net for people in economic hardship. His conception of the customary economy has a strong view of mutual aid activities.

However, the relationship between farmers and middlemen we found was similar to Hayami et al.'s (1999) results, who attributed it to the motivation to save transaction costs and reduce risks arising from moral hazard and opportunism under information asymmetry. This study found that farmers with shorter trading periods tended to emphasize shrimp prices more, whereas those with longer trading periods tended to consider reasons other than price, preferring middlemen who have sincerity and kindness.

It is often mentioned that small-scale farmers tend to be dominated by middlemen; however, our study site was different. As farmers responded that there is no significant difference in shrimp prices and that they can check price information on their smartphones, there appears to be little asymmetry in price information and the moral hazard arising from it. Farmers considered the working manners of the middleman to be important, such as whether they weighed the shrimp accurately and whether they would pay immediately or on the promised day. In this regard, at the study site, middlemen were actors who had to work harder to maintain relationships with farmers rather than to dominate farmers. This is evidenced by one middleman who stated that, unlike in the past, there were many middlemen and they had to visit farmers to buy shrimp so that they would not lose their farmers to other middlemen. Farmers were not inferior to middlemen in terms of their power relations. This may be because shrimp are an internationally competitive product in the first place and the shrimp in Village V are valuable products produced in a unique agroecosystem.

Farmers and middlemen interacted daily, drinking coffee and beer, and celebrating family events. Their relationship was more than just a business one. These interactions may contribute to reducing the risk of moral hazard arising from information asymmetry.

During the field survey, the local farmers were wary of us as strangers and reluctant to be interviewed. In addition to these characteristics, as one farmer responded, the trust between the farmers and the middleman was strengthened by the accumulation of previous transactions. Therefore, Company A, an outsider to local farmers, had few opportunities to negotiate with farmers to ask them to sell shrimp to certified middlemen.

In contrast, middlemen were affected by IEC. Two out of five middlemen changed their sales direction to Company A's wholesaler because of the higher price and price premiums. Middleman C received 4,000,000 ~ 5,000,000 VND per month as price premiums, and Middleman E received 2,000,000 VND per month as price premiums. Middleman D also considered selling shrimp to Company A's wholesalers. This result suggests that middlemen are more sensitive to price and behave more economically in the market. They played the role of connectors between the customary and market economies.

Generally, IEC is expected to upgrade local production systems to meet global standards. However, this study also found that IEC translated existing local values to a global level rather than changing them. In other words, although the IEC remained bureaucratic, local practices were still based on local values. The two different logics were accidentally connected through middlemen who played an intermediary role between the customary and market economies. Since local production systems already met the standards for organic certification, local values preceded the introduction of IEC. This result is consistent with the idea that the hill tribes were not inferior to lowland states in any way, and their practices sometimes affected the state's performances in terms of governance (Scott, 2009). Accumulating more findings of local values that precede the global effort contribute to rethinking the current method of constructing topdown global environmental governance, which could then ameliorate the problems caused by the IEC's foundations in Western notions of rationality and reason (Hatanaka, 2014) and the imposition of bureaucratic and industrial conventions on southern producers (Reynolds, 2004).

On the other hand, IEC may increase the information asymmetry between farmers and middlemen. This is because middlemen clearly benefit more from participating in the system. Scott (2009) found that local robustness led to the avoidance of state governance. Compared to his study, what did local robustness at this study site bring to the community? Although IEC approved local value with lower transaction costs, it seemed that few certified farmers benefited from IEC. Clearly, the beneficiaries were those involved in the downstream side of distribution, such as middlemen and Company A. Local farmers were not exploited; however, they did not participate in a meaningful way in IEC. Local farmers did not have the initiative against global interventions compared to the Alaska case (Foley & Hebert, 2013). This may be due to the lack of collectivism, as the study area was formerly a frontier and most of the residents were immigrants. In addition, social movements in Vietnam are less active than those in other countries, such as Thailand (Phatharathananunth, 2006; Vu 2017). Therefore, the local robustness at our study site did not bring additional benefits. Also, the specific benefits of local robustness depends on the social and historical contexts of the region.

Conclusion

This study examined the process of forming market-based governance from the perspective of local society and considered the meaning of governance for each actor. In particular, we examined how local society changes IEC by investigating interactions between global and local actors, using IEC for shrimp farming in mangroves of southern Vietnam as a case study.

The results show that IEC did not change local production practices and had a limited impact on upstream trading practices in the supply chain. Rather, local society unintentionally determined whether shrimp were certified or not. It was difficult for the company, as an outsider, to establish a supply chain for certified products by using the existing upstream, as evidenced by the fact that it was forced to build its own wholesaler in the village. In short, IEC was at the mercy of local society. Although there is a concern that IEC reproduces inequalities (Hatanaka, 2013; Raynolds, 2004) and put additional burdens and transaction costs on smallscale farmers to adopt global standards (Marschke & Wilkings, 2014), the local society at this study site was robust against even global governance. We attributed this to the unique local production that depends on the mangrove agroecosystem and the customary economy.

In contrast to existing studies, local robustness did not additionally benefit local farmers. This was because the village was originally a frontier that lacked collectivism. As it is criticized that farmers are "objects" for certification and not project partners with equal weight and power (Baumgartner & Nguyen, 2017), they did not participate in a meaningful way in IEC. In addition, given the finding that middlemen more clearly benefit from IEC, it appears that IEC may again increase the information asymmetry between farmers and middlemen.

Our case study provides two interpretations. The first is that there should be alternative research viewpoints on how local society can transform IEC to fit the pre-existing local political economy. Although much research has examined how IEC can upgrade local society to global standards, few studies have examined it from a local perspective. If more research investigates how IEC can be "upgraded" based on local values, it would be interesting. Second, more research is needed on the relationship between information produced by environmental science and local society. IEC virtualizes ecosystem services to use scientific knowledge, which is difficult for those who are not familiar with science. Although this is our research limitation, this study implies that IEC may increase information asymmetry between local actors upstream, an aspect that needs to be examined in future research.

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Data Availability The datasets generated and/or analyzed in this study are available from the corresponding author upon reasonable request.

Declarations

Informed Consent Informed consent was obtained for all respondents.

Conflict of Interest No potential conflict of interest was reported by the authors.

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