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Linking smallholder fish farmers to output markets: the dominance of collectors in aquaculture of Tam Giang lagoon, Central Vietnam

Nguyen Van CHUNG[1*], Martin ABWAO[2], Hoang Dung HA[1], Le Chi Hung CUONG[1], Tran Cao UY[1], Nguyen Tien DUNG[1]

[1] Faculty of Rural Development, University of Agriculture and Forestry, Hue University, Hue city, Vietnam
[2] Faculty of Agriculture, Egerton University, Nakuru city, Kenya
Corresponding author: nguyenvanchung@hueuni.edu.vn

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Abstract

Market access plays an important role in increasing smallholder's income; however, informal markets are typical in developing countries. Traders often dominate agricultural markets. In Vietnam aquaculture, collectors are important actors and act as an intermediary in linking farmers and buyers. This research aimed to explore and analysis the functions and the dominance of collectors in linking with smallholder fish farmers in Tam Giang lagoon, central Vietnam. The qualitative research is applied through 55 semi-structured interviews including smallholder fish farmers, collectors, wholesalers, retailers, officers of local government and second information from statistic data and reports. The research findings showed that linking of smallholder fish farmers to output market has dependence on collectors while all aquatic products have to pass on collectors before distributing to next buyers. Collectors always have strategies to maintain the relationship with smallholders and they always have an advantage status in aquaculture value chain. Collectors are also considered as a barrier of smallholder farmers to access potential marketing channels. Informal transaction and trust are characterized in the interaction between collectors and smallholders.

Keywords: *aquaculture, poly-culture, governance, smallholder farmers, market linkages, Tam Giang lagoon*

Rezumat. Conectarea micilor piscicultori cu piețele de desfacere: dominația colectorilor în acvacultura din laguna Tam Giang, Vietnamul Central

Accesul la piață joacă un rol important în creșterea veniturilor micilor fermieri, dar piețele informale sunt tipice în țările în curs de dezvoltare. Comercianții și cumpărătorii predomină adesea pe piețele agricole. În acvacultura din Vietnam, colectorii sunt actori importanți și acționează ca un intermediar în legătura dintre fermieri și cumpărători. Această cercetare își propune să exploreze și să analizeze funcțiile și predominanța colectorilor în legătură cu micii piscicultori din laguna Tam Giang, centrul Vietnamului. Cercetarea calitativă este aplicată prin intermediul a 55 de interviuri semi-structurate care includ micii piscicultori, colectori, angrosiști, comercianți cu amănuntul, funcționari ai administrației publice locale, la care se adaugă informații secundare din date și rapoarte statistice. Rezultatele cercetării au arătat că legarea micilor piscicultori de piața de desfacere depinde de colectori, pentru că toate produsele din acvacultură ajung la colectori înainte de a fi distribuite următorilor cumpărători. Colectorii au întotdeauna strategii pentru a menține relația cu micii acvacultori și au întotdeauna un statut avantajos în lanțul valoric al acvaculturii. Colectorii sunt, de asemenea, considerați ca o barieră pentru micii fermieri în accesarea unor potențiale canale de comercializare. Tranzacțiile informale și încrederea sunt caracteristice în interacțiunea dintre colectori și micii producători.

Cuvinte-cheie: *acvacultură, policultură, guvernare, micii fermieri, conectarea pieței, laguna Tam Giang*

Introduction

The world has approximately 1.5 billion smallholder farmers, who depend on agriculture-based food, income and livelihood (Ferris et al., 2014). As a result, market access plays an important role in increasing smallholder's income and opens opportunities for expanding production and improving productivity. increasing rural income and reducing poverty (Al-Hassan et al., 2006; Ouma et al., 2010). Liberalization and urbanization, the rise of supermarket chains and globalization induce changes in the agricultural marketing system, which creates new market-based opportunities for smallholders in developed and developing countries (Onumah et al., 2007; Qaim, 2017). Informal markets are typical for the majority of smallholder farmers in developing countries, as they account for 80 – 90% of the agricultural products (Ferris et al., 2014)

Challenges in market access of smallholders have become common, especially in less developed countries (van Tilburg and van Schalkwyk, 2012). The participation of smallholder farmers is limited because of high marketing and transaction costs (Birthal, 2008; Amare et al., 2019). Additionally, smallholders are facing the problem of accessibility to guaranteed markets, as high volatility is a typical feature of local commodity markets (Al-Hassan et al., 2006; Rahim and Zikhali, 2017). On the other hand, traders and buyers often dominate the agricultural markets of developing countries where the lack of selling opportunities is a frequent issue for farmers (Haji, 2008; Sexton and Xia, 2018). In reality, a few

multinational companies and international supermarket chains hold buying power, while less bargaining power belongs to producers (Onumah et al., 2007; Kononets and Rajcaniova, 2020). Thus, farmers tend to sell their products to vendors or informal traders despite price instability (Birthal, 2008; Birthal et al., 2017).

Vietnamese agriculture in general and aquaculture in particular have typically characterized by informal market, many researches showed that collectors are important actors and act as an intermediary in linking between farmers and buyers while they have advantages in logistics and payment methods. Moreover, collectors clearly understand on demand of farmers to make a trust and reach a long-term relationship. Therefore, close relationships are conducted between collectors and farmers in the aquaculture marketing system (Vien et al., 2005; Do, 2017; Ha et al., 2013; Ho and Burny, 2016; Van Nguyen et al., 2021). These studies have indicated the importance of collectors in output market, as well as the dependence of smallholder farmers in aquaculture sector. However, the interaction between smallholder fish farmers and collectors seems to be different among aquaculture types, aquatic products, geographies and characteristics of stakeholders in various regions.

This research aimed to explore the functions and activities of collectors and analyse their control and dominance in the linkage of smallholder fish farmers in Tam Giang lagoon, Thua Thien Hue province, Central Vietnam. Tam Giang lagoon is considered as the largest brackish water lagoon in Southeast Asia, with approximately 22,000 hectares and about 300,000 people living around the lagoon. Most people have lagoon-based livelihood such as fishing and brackish water aquaculture (Van Tuyen et al., 2010). In line with one million fish farmers in Vietnamese aquaculture, most participants are smallholder farmers (McCoy et al., 2010; FAO, 2019), who are the most vulnerable actors and gain lower profit than other actors in aquaculture value chain, especially intermediaries (Loc et al., 2010; Van Nguyen et al., 2021). The research will provide a better understanding on interaction between smallholder farmers and collectors in aquaculture of Tam Giang lagoon where informal transaction often happens and trust is still a key determinant in transaction, while collectors have suitable strategies to maintain their competitive advantages in relationship with smallholder farmers.

Literature review

Market access of smallholder farmers

Globally, major changes in food system is real resulting to income growth, urbanization, communication, market concentration and innovation (De Haen and Réquillart, 2014). Otherwise, the changes in marketing chain are more integrated and more demanding of quality and food safety. Higher-value production will develop, if the farmers can respond to these markets. However, small farms are not easily accessed to these markets, which lead to the falling behind of many small farms (Hazell, 2005).

In reality, small scale agriculture is still popular in much of the developing countries and contributes an important role to many rich countries (Hazell, 2005; Fischer and Qaim, 2010). Income and employment of 70% of the world's poor in rural area mainly come from smallholder agriculture (Poole, 2017). Thus, rural growth and livelihood improvement are results of contribution from market participation of smallholder agriculture (Hazell, 2005), as well as improving farmer's production capabilities and market access (Jayne et al., 2010).

The development of modern markets such as supermarket system in developing countries and industrialized world opens up opportunities for small farmers to access market (World Bank, 2008). In fact, a better market for agricultural products and opening opportunities for income generation are established through combination between smallholder farmers and market (Adenegan et al., 2012). However, there is a limitation in selecting output markets of many small farmers in developing countries (World Bank, 2008), while they are meeting issues in accessing to markets of developed countries and unfair competition in domestic markets because of subsidized imports (Hazell, 2005). Small farmers have become vulnerable in the context of trade liberalisation when their buyers such as purchasing agents and cooperatives have changed (Kalinda et al., 1998).

Market access of the farmers is hindered while they meet difficulties in producing a commercial volume, which causes by lack of finance, the high level of set up cost in certain industry sectors, lack of knowledge and a general lack of infrastructure and poor access to transport and communication, lack of information, inability to have contractual agreements, poor organizational support, low access to extension agents, low use of improved seed and low use of fertilizer with relatively small marketable surplus (Vien et al., 2005; Van Hoi et al., 2009; Sartorius and Kirsten, 2006; Osmani and Hossain, 2015; Van Huong et al., 2016).

Typically, in developing countries, small-scale farmers face major disadvantages in interactions with upstream and downstream agents such as higher external transaction costs and asymmetries in market power (Fischer and Qaim, 2010). Market participation of smallholders can be prevented by transaction costs, which involve all costs of entering into

contracts, exchange or agreement: searching for trading partners, screening potential candidates, obtaining and verifying information, bargaining, transferring the product, and monitoring, controlling and enforcing the transaction (Randela et al., 2008). Moreover, the demand for cash to pay for goods, health services and debts and the lack of storage facilities, as well as fear of losses that force farmers to sell the agricultural products immediately after harvesting. This puts farmers into the disadvantaged position in negotiations among actors of agricultural value chain (Kalinda et al., 1998).

As a result, the constraints in market participation of smallholder farming will affect the economic growth. Thus, market participation is always paid attention in developing world (Osmani and Hossain, 2015) while designing appropriate policy instruments, institutions and other interventions can be conducted through analyzing elements influencing market participation of smallholder farmers toward sustainable economic development (Chirwa and Matita, 2012).

Governance and the role of intermediaries

A network-based system of regulation, which is established from processes of exchange and negotiation, is considered as governance (Carnoy and Castells 2001). Based on the different relationships between buyers and suppliers, as well as power asymmetry among value chain actors, Gereffi et al. (2005) identified five types of governances, from market, modular, relational, captive to hierarchy, which are arranged from low to high level of power asymmetry. In which, each type is identified by a corresponding form of governance. Market is governed by price, modular is governed by standards, relational is governed by trust and reputation, captive is governed by buyer power, and hierarchy is governed by vertical integration (Gereffi et al., 2005; Ponte and Sturgeon, 2014).

Trade liberalization has contributed to the development of agricultural supply chain in the global markets, which creates the linkage between traditional agricultural production and modern markets (export markets or domestic supermarkets) (Zhang and Aramyan, 2009). However, in two types of governance structures including producer-driven and buyer-driven (Gereffi and Korzeniewicz, 1994), buyer-driven is common in agri-food chain, where large retailers or companies are often owners of decisions-making in the nature of activities and actors in the chain (Tallontire, et al., 2011). Captive value chains are typical in agro-food system of developing countries, which result in the large fragmentation of smallholder farmers and the dependence of smallholder farmers on large buyers (Gereffi et al., 2005; De Noni et al., 2017). Selection of market channel was also affected by household income, distance to road, market information and gender. Low household income and experience, poor access to extension services and high distance to road led to increase the rate of produce selling to intermediaries (Muthini et al., 2017)

The dependence of smallholder farmers has come from transaction costs while they were considered as barriers to market participation of most smallholder actors in agricultural sector (Jagwe, 2011; Sebatta et al., 2014). However, the cost of transactions and information can be decreased through participation of intermediaries while they have a key role in the marketing of commodities, especially in remote and poor infrastructure areas (Jagwe, 2011; Van Duijn et al., 2012). In developing countries, farmer's produce is mainly consumed by intermediaries because the farmers lack reliable price information and they cannot determine quality of produce while the transport costs are high (Goyal, 2010; Ha et al., 2013; Ho and Burny, 2016; Van Nguyen et al., 2021).

Based on intermediaries, quality standards can be guaranteed and remained in complex food supply chains and a holistic view of the retail supply chain is verified to create effective and efficient supply chain activities through reducing costs (Hingley et al., 2015). Trading through middlemen helps buyers secure sufficient supply in a particular region, while it may be impossible for farmers to ensure that supply if buyers buy directly from them. Thus, through buying from middlemen buyers can increase their competitiveness (Tran et al., 2013; Abebe et al., 2016).

Furthermore, a better understanding on impact of downstream restructuring on upstream decisions is clearly identified through understanding the role of intermediaries (Bignebat et al., 2009). They are connectors between producers and consumers, and direct or indirect contribution in value chain sustainability (bt Musa et al, 2014), which are verified on the role of intermediaries, namely, consultant, broker, mediator and resource provider (Howard, 2007). Consequently, direct links to outside markets and the provision of credit are two key roles of middlemen that influence socio-ecological dynamics in communities (Crona et al., 2010).

Study area

Tam Giang lagoon is located in Thua Thien Hue province, central Vietnam, which is known as the biggest lagoon in Vietnam. It runs 68 KM along the shoreline. The lagoon is typicall by brackish water system that is suitable for aquaculture production. Aquaculture in Tam Giang lagoon started in the 1990; farmers have used water surface resource of the lagoon and converted agricultural land into aquaculture. From the beginning time until present,

aquaculture in Tam Giang lagoon has passed significant changes from monoculture (black tiger shrimp farming) to poly-culture and diversity of aquaculture types including net enclosure aquaculture, lower tidal aquaculture and upper tidal aquaculture. Area under aquaculture was about 3,300 hectares and aquaculture production reached about 16,000 tons in 2019 (GSO, 2021). Aquaculture production at Tam Giang lagoon has contributed to the transformation of rural economy from low-yield agricultural production to high-value and efficent aquaculture. Aquaculture has created employment and increased income for 10,000 households with over 21,000 labors at research site. Nowadays, poly-culture is main aquaculture type in Tam Giang lagoon. Poly-culture is to combine among different species in a fish pond. The combination is typically between black tiger shrimp (*Penaeus monodon*), crab (*Brachyura*) and fish (such as *Siganus, Scatophagus argus, dorab, Lates calcarifer* or *Sciaenops ocellatus*). Poly-culture has provided a sustainable livelihood for fish farmers when it creates a stable income for farmers and fish farmers do not have fear of losses as black tiger shrimp farming.

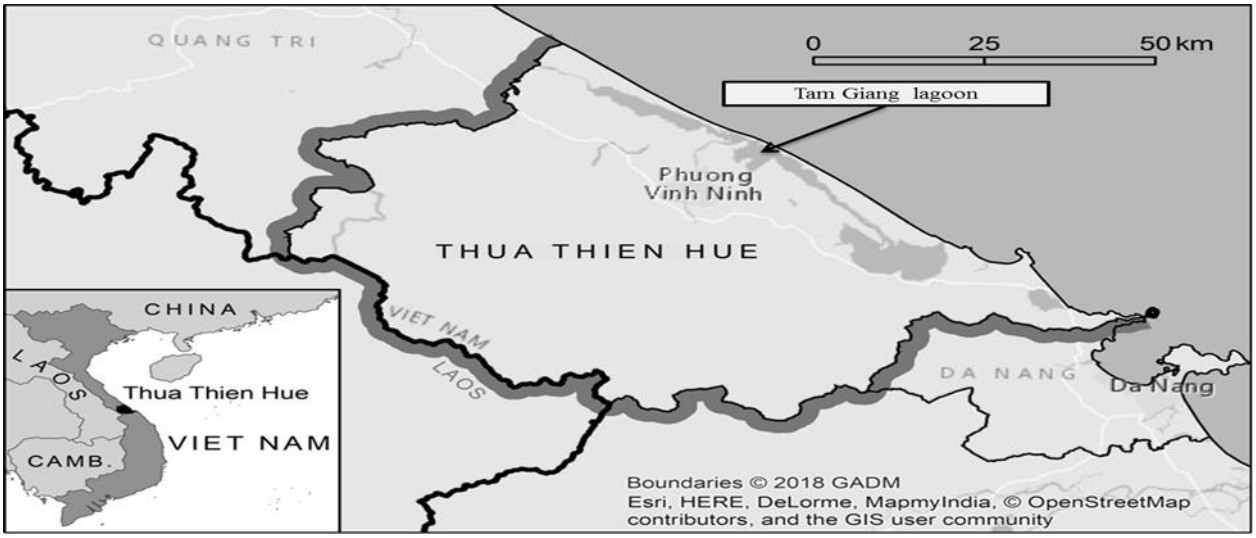

Fig. 1: Location of Tam Giang lagoon (own adaption)

Data and Methods

The qualitative research was conducted in this study. Based on qualitative research, the subject matter is explored, explained and analysed to be in-depth understanding (Chenail, 2011). 55 semi-structured interviews were implemented to collect primary information from smallholder farmers, collectors, wholesalers, retailers, officers of local government. The interview partners were selected by criteria including they are directly participating in aquaculture production; they are direct buyers of aquatic products at research site and they have rich experience in aquaculture and are supporters of aquaculture at locality. The study concentrated to collect information about characteristics of aquaculture, marketing channels, the role and function of actors in aquaculture value chain and power relationship between actors in the chain. To select interview partners, the study used snowball approach to find out main actors and support actors of aquaculture value chain. Through snowball method, the next interview partners were chosen based on information of previous interview partners when they have business relationships or they are involved actors in the chain (Noy, 2008). Secondary information is collected from statistic and reports of functional units, government levels of Thua Thien Hue province, as well as websites and other researches. The information on status of aquaculture production and consumption, advantages and disadvantages in aquaculture, as well as development orientation and planning in the future were also collected to provide context and additional information. The primary and secondary information were collected to address the following research questions:

- What are the characteristics of aquaculture production and consumption in Tam Giang lagoon?
- What are the role and function of intermediaries in the aquaculture value chain?
- How is the interaction between smallholder fish farmers and intermediaries characterized?

The collected information were synthesized and analyzed based on the research questions. It then conducted the foundation for the content analysis and discussion of empirical results that will be outlined in next sections.

Results

Characteristic of smallholder fish farmers in Tam Giang lagoon

Poly-culture attracted the participation of many smallholder farmers. Most farmers did not have experience in starting time of aquaculture activity, since majority of them changed from fishing activity to aquaculture, and the rest was from agricultural production. Farmers were trained on aquaculture technology through workshops and training courses, which were organized by industrial feed companies, aquatic medicine companies, and functional units in Thua Thien Hue province. However, almost all fish farmers mentioned that their experience came from practice and exchange among themselves.; Therefore, they have been free in applying technological advancement. Moreover, each farmer has different qualification (unschooled, primary school, secondary school and high school), economic conditions (poor household, semi-poor household and median household) and age (old people and young people), thus, accessibility and applicability of technical advances are different in aquaculture production.

"*When we caught small fishes in the past from fishing activity, we would continue to raise them in our fish pond. We did not have any technology processes. When we had opportunities to participate in training courses on technology processes, and practice, our technology was improving day by day*". (a farmer in Phu Xuan commune).

Smallholder fish farmers are main producers in aquaculture, who have over 15 years of experience. Average aquaculture area of each household is about 5,000 m^2. There are normally two seasons per year and fish farmers can earn from US$ 2,700 to US$ 4,500 per season. Most farmers have connection with each other in exchanging knowledge, sharing information about input factors, prices, output and they can help each other in feeding process. However, there are differences among farmers in stocking time, harvesting time, demand for input factors, knowledge and know-how in aquaculture, which relate to experience and production strategy of each farmer to achieve highest effectiveness.

On the other hand, small-scale aquaculture is still common in the lagoon. Fish farmers still lack technological process and aquaculture activity is still spontaneous. Moreover, aquatic products are still consumed by traders and the likings in production and consumption under value chain have not developed yet. Consequently, accessibility to market information of farmers is still limited when they only get information from collectors and other farmers. Ability to find output market that is still a problem of farmers and they did not have connection together in selling their products. All of farmers have different strategies to sell their products. But there is no competition among farmers since all aquatic products are always bought by collectors. From this situation, there is a dependence of farmers on their collector and it is not easy to change or find out new buyers.

"*I always sell my aquatic products when the price is suitable or when aquatic products are big enough for selling. Nobody cares about linkage in selling activity, because the price of aquatic products are equal among collectors; if you want to sell your products at high price, you can bring them to sell at wholesale market*" (farmer in Quang Cong commune).

Aquaculture value chain in Tam Giang lagoon

The aquatic products of farmers are sold after stocking fingerlings 3 or 4 months, which depends on the size of fish, crab and shrimp (aquatic products), price and decision-making of each farmer. The farmers will collect 5 – 10 kg of aquatic products per day during one month, which is typical feature in poly-culture because there are differences in size of aquaculture subjects. Therefore, farmers can choose suitable species to harvest depending on their strategy. After harvesting, all aquatic products of farmers are directly sold to collectors, and then, they are distributed to wholesalers, retailers and agents before reaching consumers (Fig. 2). Aquaculture value chain in Tam Giang lagoon has the participation of various actors, of which, input suppliers, farmers, collectors, wholesalers and retailers are main actors of the chain. Input suppliers provide raw materials for poly-culture such as fingerling, aquafeed, aquatic medicines. Input suppliers are distributed throughout Thua Thien Hue province. Each supplier can undertake one or various types of raw materials. Farmers are key producers in aquaculture, who are local residents at Tam Giang lagoon. Fisheries and aquaculture are their main livelihood. There are differences among farmers in aquaculture, for instance, farming scale, experience year and the level of success in aquaculture. Collectors are fish buyers, even, some collectors are also fish producers. Collectors have responsibility to directly collect aquatic products from individual farmers and then pass to next buyers. Wholesalers and retailers can directly buy aquatic products from collectors. Wholesalers always buy higher quantity than retailers. The products from wholesalers are sold to other retailers, and then, the products are provided for consumers by retailers at local markets. In Tam Giang lagoon, collectors play a key role in distribution of aquatic products while the aquatic products always flow cross them.

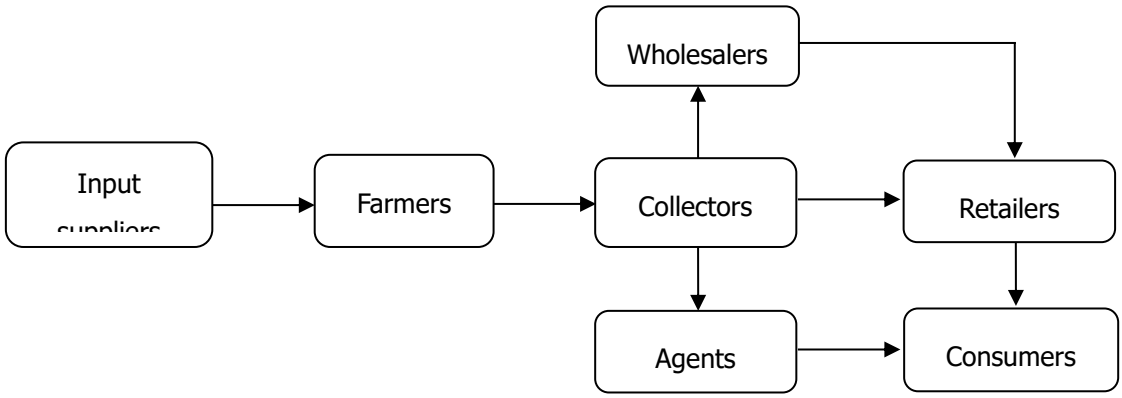

Fig. 2: Aquaculture value chain in Tam Giang lagoon

Source: Stakeholder interviews

After that, most quantity of the aquatic products is delivered to wholesalers and retailers and the rest are sold to agents. Each commune has some collectors, who are local people and undertake the function in solving output market for farmers in their community. Consequently, collectors and farmers always have strong relationship. Meanwhile, wholesalers, retailers and agents often come from other communes to buy the aquatic products from collectors at local market. As a result, collectors act as connectors between farmers and other buyers thus controlling and dominating the chain while other actors become dependants.

The dominance of collectors in relationship with smallholder fish farmers

Normally, trading activity between farmers and collectors is implemented at farmers' fish ponds. Each collector has one farmer group, who are always willing to provide the aquatic products. The number of members in farmer group is different among collectors (20 – 30 farmers per group), which depends on consumption capacity of each collector. The farmer group was found through a long-term business relationship between farmers and collectors, each farmer and collector will find out a suitable partner for them.

Farmers often select collector based on the following criteria: (i) attitude of collector (in calculating exactly kilogram and timely in payment); (ii) availability of collector (the collector has to buy all farmers' products when their products have problems such as disease, when the price is high, or whenever farmer want to sell their products); (iii) fairness of collector, (the price is always similar among collectors and among farmers in the group of collector); (iv) lending capital without interest (collectors have to support finance or equipment for farmers whenever they have needs).

"*I had sold my products to many collectors, and then, I selected the main collector for my family; because this collector has prestige, exactly in calculating the weight of products and is fair. Moreover, this collector is always available and the collector never owes me money*" - A farmer in Hai Duong commune said.

In order to maintain the relationship with farmers, collectors always attempt to satisfy the requirements of the farmers in their group. There are many collectors from various communes, and sometimes, they have competition with each other to ensure the right quantity of products is distributed to wholesalers and retailers. In doing so, the collectors try to maintain the number of farmers in their group to achieve optimal profit in their business activity. Besides, each collector always buys all aquatic products from farmers in the group. Even though, collectors clearly understand the eminent loses involved during the seasons of high supply of aquatic products, they still buy from farmers to help them cushion thier losses. Therefore, farmers and collectors in each group always trust and support each other. However, farmers will change collector, if the collector always buys their products cheaper compared to other collectors.

"*I am always willing to support farmers in my group such as lending money, buying all their products at suitable price, which are necessary conditions to maintain our relationship. If I do not support the farmer, he will find other collectors. Additionally, if some farmers sold their products to me at lower price than other collector in my village, they will immediately ask me to pay more*" (a collector in Phu Xuan commune).

Lending money without interest is a strategy of collectors to maintain the number of farmers in their group. Collectors are always willing to lend money for farmers since they know that they will get the

supplies at harvest. Farmers do not want everybody in their village to know that they are in debt for the fear of losing their prestige If farmers do not have enough capacity to pay back the loan, collectors will equate the amount of money owed to the quantity of the aquatic products of farmers. Most farmers borrowed small amount of money, for example from US$ 130 to US$ 220 at a time thus easily repaid. back money. Therefore, lending money to farmers is an informal contract between farmers and collectors.

A collector in Hai Duong commune said that *sometimes, if farmers need money for their life or production, they will borrow from me; they can pay back whenever they have. And so far, there is not anybody that has not paid me back.*

Farmers cannot directly supply to wholesalers, retailers or agents, or become collectors, since farmers cannot connect to them while the collectors had a long-term business relationship with them. Furthermore, wholesalers, retailers and agents do not want to waste their time to collect enough quantity of aquatic products from farmers while they can easily get the right quality and quantity from the collectors. In addition, farmers do not have enough capital to implement activities as collector. Importantly, farmers simply think that, collectors spent much time in trading activity and they support farmers in many aspects thus rightfully earning the profits.

A retailer in Quang Cong commune said that *collectors participated in business activity in a long-term and they had more experience. Besides, they had sellers and buyers' group already, how can we compete with them*?

Although each collector always tries to maintain the number of farmers in the group, they do not want to increase the number of farmers due to the number of buyers of collectors depend on the quantity of the aquatic products.

The support of collectors to farmers combined with their linkage to buyers, which have maintained power and status of collectors in the relationship with farmers in particular and in aquaculture value chain at Tam Giang lagoon in general. Although farmers can sell their entire aquatic products, they cannot contact other marketing channels to improve on value addition of their products. Output market of aquatic products is controlled by collectors and they have right to dominate the chain.

Discussion

The relationship between collectors and smallholder fish farmers as mentioned above is an informal interaction, which was also characterized in previous researches (Ha et al., 2013; Ho & Burny, 2016; Andriadi et al., 2019). The willingness provides services such as finance, information, equipment, standards that contributes to increasing the role of intermediaries in developing countries in general and particularly in Vietnam. While intermediaries play a key role in output market, smallholder farmers do not have many options in marketing channel (World Bank, 2008, Van Nguyen et al., 2021). Aquaculture of Tam Giang lagoon is divided into smallholder farmer group for each collector Smallholder farmers only have one marketing channel and totally depend on collectors for buying of the aquatic products. Although output market of aquatic products is always guaranteed by collectors, price pressure can be serious problem when there is collaboration among collectors and market failure will result from absence of collectors in aquaculture value chain. The power and monopoly of intermediaries in buying depended on the types of aquacultures, as Van Nguyen et al. (2021) found that the monopoly in buying result from dividing territories between middlemen. In Tam Giang lagoon, the monopoly of collectors has resulted from dividing the number of farmers who are the members in one group of collectors.

Normally, farmers do not have contracts relating to quantity, quality, and price of products and payment, which leads to instability in daily transaction costs. (Vien et al., 2005; Van Hoi et al., 2009). High transaction costs and low price of output are constraint factors in accessing markets of farmers (Lapar et al., 2006). Study reveals that transaction in aquaculture is done by trust among stakeholders in Tam Giang Lagoon. Transaction between collectors and smallholder farmers is through oral agreement, for instance in price of aquatic products, the farmers can compare price among collectors or among farmers to negotiate; but the final price is determined by collectors.

Although smallholder farmers can produce high quality products, accessibility to market is still difficult because of small and infrequent quantity and the difficulty in distinguishing between high quality products and other products from mass of smallholder farmers. While local markets are still first selection of smallholder farmers, domestic and even export market is more profitable for the participatory smallholders (Ashraf et al., 2008). Similarly, local markets remain the main markets in poly-culture. Selling the aquatic products at fish ponds is still common in Tam Giang lagoon, which became a tradition of farmers' transaction.

On the other hand, it is not similar as monoculture type such as shrimp farming or pangasius farming where farmers harvest and sell aquatic products to middlemen, large wholesalers or processing plants in one time (Van Duijn et al., 2012; Tran et al., 2013). In poly-culture type, smallholder farmers only harvest 5 – 10 kg of aquatic products per day, which does not respond to demand of other buyers such as wholesalers, agents. Thus, collectors will undertake the function in collecting enough quantity to satisfy

the requirements of other buyers. This is also a barrier to entry other marketing channels of smallholder farmers.

Moreover, with competitive advantages in geographical location, linking to next buyers, lending finance without interest, ensuring output market combining with trust of smallholder farmers, collectors have high power in the value chain and become dominant in the relationship with smallholder farmers. The relationship between smallholder farmers and collectors is not only characterized by both captive and relational (Gereffi et al., 2005; De Noni et al., 2017), of which, informal transaction and trust are features in interaction pattern between collectors and smallholder farmers, which is showed in figure 3.

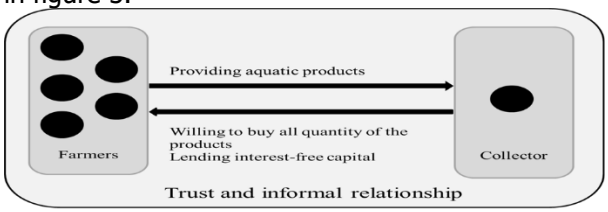

Fig. 3: Interaction pattern between smallholder farmers and collector

Source: stakeholder interviews

The research results from interviewing fish farmers, intermediaries and relevant actors also indicated that output market access is a crucial factor to develop aquaculture production (Van Huong et al., 2016). However, in case of Tam Giang lagoon, the output market is not an issue while all quantity of aquatic products from fish farmers are undertook by collectors. The factors affecting the output market access such as low quantity of products, lack of knowledge, finance and information or low infrastructure, high distance to markets can be addressed by the available of collectors. A relationship between smallholder fish farmers and collectors is conducted based on trust and informal transaction, where it sometime has higher value than a contract. Although the values and benefits from the relationship have provided for both collectors and fish farmers, the power asymmetry, limited decision making and other disadvantages often stand at fish farmers' site.

Conclusion

Linking of smallholder farmers to output market is dependent on collectors, who are playing important role in aquaculture value chain in Tam Giang lagoon. All aquatic products of smallholder farmers have to pass on collectors before distributing to next actors. Each collector has one smallholder farmers group; thus, a relationship exists between them. Collectors always have strategies to maintain this relationship, as well as the number of smallholder farmer in the group such as buying at suitable price, buying all aquatic products of smallholder farmers group, lending money without interest. Besides, attitude, availability, fairness and willingness to lending capital of collector are criteria of farmers to set up a relationship with collectors. Collectors have created advantage status in the chain while smallholder farmers are always guaranteed output market for their products. Collectors are connectors between farmers and other buyers, and also consider as a barrier of smallholder farmers to access potential marketing channels. Consequently, output market of aquatic products in Tam Giang lagoon is controlled and dominated by the collectors and smallholder farmers are often dependents in the value chain. The linkages among fish farmers under cooperative form is to improve bargaining power when they can provide high quantity and quality of the products. After that, fish farmers can find out potential partners to establish vertical linkages toward the development of aquaculture value chain.

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Author contribution

Theoretical framework and methodology, N.V.C.; data collection, N.V.C., H.D.H., T.C.U., L.C.H.C. and N.T.D.; formal analysis, N.V.C and M.A.; original draft manuscript, N.V.C.; finalizing the manuscript, N.V.C., M.A. H.D.H., T.C.U., L.C.H.C. and N.T.D.

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