

Studying the Value-Added Chain for the Fish Distribution Process at Quang Binh Fishing Port in Vietnam

Van Chung Nguyen

Abstract—The purpose of this research is to study the current status of the value chain for fish distribution at Quang Binh Fishing Port with 360 research samples, in which the research subjects are fishermen, traders, retailers, and businesses. The research uses the approach of applying the value chain theoretical framework of Kaplinsky and Morris to quantify and describe market channels and actors participating in the value chain and analyze the value-added process of these companies according to market channels. The analysis results show that fishermen directly catch fish with high economic efficiency, but processing enterprises and, especially retailers, are the agents to obtain higher added value. Processing enterprises play a role that is not really clear due to outdated processing technology; in contrast, retailers have the highest added value. This shows that the added value of the fish supply chain at Quang Binh fishing port is still limited, leading to low output quality. Therefore, the selling price of fish to the market is still high compared to the abundant fish resources, leading to low consumption and limiting exports due to the quality of processing enterprises. This reduces demand and fishing capacity, and productivity is lower than potential. To improve the fish value chain at fishing ports, it is necessary to focus on improving product quality, strengthening linkages between actors, building brands and product consumption markets at the same time, improving the capacity of export processing enterprises.

Keywords—Quang Binh fishing port, value chain, fish market, distributions channel.

I. INTRODUCTION

ALTHOUGH income from fish plays an extremely important role in Quang Binh's economy in general and Quang Binh's people in particular; however, the added value that fish brings is still not high compared to its potential. Therefore, researching the added value chain for the fish distribution process at Quang Binh fishing port, Vietnam is very necessary in the current period.

Quang Binh is a central coastal province, with a coastline of over 116 km, which is very convenient for exploiting seafood to serve Quang Binh's economic development. According to Resolution No. 36-NQ/TW dated October 22, 2018 of the Central Committee of the Party on the Strategy for Vietnam's marine economic development to 2030, with a vision to 2045, Quang Binh Province has issued the following programs: action plans and specific plans to maximize the potential and advantages of the marine economy [8]. The focus is on strongly developing marine economic sectors, especially coastal

industry, aquaculture and fishing, fisheries logistics; marine mineral exploitation; renewable energy combined with marine tourism development. In which, fishing ports play an extremely important role in the coordination of fishing activities, fisheries logistics; marine mineral exploitation is the place to provide seafood from exploitation to final consumers including wholesalers and therefore, improving the seafood value chain for fishing ports will help the total revenue of the economy increased significantly. Fishery production in 2021 reached 89,063 tons, up 3.2% over the previous year. In which, fishing output reached 76,284 tons, up 3.2% over the previous year; aquaculture production reached 12,779 tons, up 3.6% over the previous year [7].

TABLE I
AQUATIC PRODUCTION (UNIT: TONS) [7]

Content	2015	2018	2019	2020	2021
Fisheries	57.009	64.245	69.399	73.951	76.284
Fish	53.608	61.824	66.708	69.186	70.314
Enterprises of Agriculture	57	9	29	13	6

The fishing in Quang Binh Province from 2015 up to now has steadily increased in number. In 2015, the total output of other wild fishery products reached 57,009 tons, by 2021 it will reach 76,284 tons. In 2015, the total catch of wild fish reached 53,608 tons, accounting for more than 90% of the total fishery output achieved in the year. In 2016, the total catch of wild fish reached 53,608 tons compared to 57,009 total other catches of wild fish. The same for the following years is 66,708; 69,186; and 70,314 tons of fish [7].

TABLE II
CAPACITY OF SHIP AND BOAT BY OCCUPATION [7]

Capacity of ships	2015	2018	2019	2020	2021
Under 20 CV -	2.236	3.138	3.067	3.143	3.111
From 20 CV to less than 50 CV	392	918	897	936	922
From 50 CV to less than 90 CV	217	181	138	142	144
From 90 CV or more	1.167	1.349	1.389	1.341	1.298

Among the types of ships carrying out fishing in Quang Binh (QB), the number of ships with a capacity of 90 Chevaux Vapeur (CV) or more accounts for the largest number, peaking in 2019 at 1,389 units by 2021 due to the complicated situation of the COVID-19 epidemic. Therefore, the number of ships with a capacity of 90 CV or more is reduced to only 1,298.

Van Chung Nguyen is with Quang Binh University, Vietnam (phone: 0084789930089; e-mail: vanchung20026@gmail.com).

However, the number of ships with a capacity of 90 CV or more is still higher than that of 2015 at 1,167 units. These activities are aimed at building, manufacturing, processing, purchasing, distributing and supporting the development of products/services in the chain, which may include: Inbound Logistics, the management of input materials; Operation, to convert inputs into products; Outbound Logistics, to bring products to customers such as management, distribution, processing of orders; Marketing and Sales advertising, sales promotion, selecting distribution channels to build brands, bringing products/services to customers; and Promotions and Services, related to strengthening relationships with customers, support for using after-sales services/products, related consulting services [1]-[6].

A supply chain is a network of retailers, distributors, carriers, storage facilities, and suppliers involved in the production, delivery, and sale of products to consumers. Supply chains are often made up of many companies that coordinate activities to set themselves apart from the competition [5]. Fishing and aquaculture value chains vary between fish species and between countries, and often within regions. Value chains of economically important species and some species those are not economically important, but socially important. The value chain describes a model of how seafood businesses receive raw materials as inputs, add value to raw materials through different processes, and sell finished products to customers. Furthermore, the seafood value chain can be defined as value-added activities that are linked together to convert inputs into outputs, which in turn add to profits and help create competitive advantage. A value chain typically includes inbound distribution or logistics, production, distribution or outbound logistics, marketing and sales, and after-sales service. These activities are supported by purchasing, research and development, human resource development and corporate infrastructure [2].

II. RESEARCH METHODS AND DATA COLLECTIONS

Secondary data information used in the study includes annual reports of the Department of Agriculture and Rural Development of Quang Binh province and scientific research reports related to the research issue. For primary data information, the study uses primary data collected through a survey of fishing households and traders operating at Quang Binh fishing ports. Data for research were collected by directly interviewing actors using a semi-structured questionnaire. The study uses two main analytical methods including:

- Descriptive statistical method: using absolute, relative, and average numbers; comparative method to assess the production and business situation of actors in the chain [3].
- Method of economic analysis of the value chain: to analyze the process of creating added value, net added value (profit) of each actor and each market channel in the chain [4].

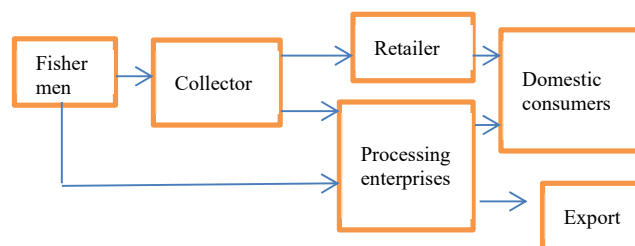


Fig. 1 Value-added chain for fish distribution at Quang Binh Fishing Port

III. RESEARCH RESULTS

A. Analysis of the Fish Value Chain at the Fishing Port of Quang Binh Province

Map of fish value chain at fishing port in Quang Binh province. Actors participating in the fish value chain at the fishing port of Quang Binh province include: Fishermen catching fish; collectors at sea; port collectors; processing enterprises; transform and export; retailer; and consumers. In addition, the fish value chain at the fishing port of Quang Binh province also has supporting agents such as the District Department of Agriculture, the Department of Agriculture and Rural Development of Quang Binh Province, the Trade Promotion Center, the Association of Seafood Exporters and Producers, Vietnam (VASEP) and commercial banks. The fish value chain at the fishing port of Quang Binh province is shown in Fig. 1.

All fish species are collected by traders on their boats or by traders at fishing ports. Harvested fish products are classified into two categories by weight, high quality grade 1 fish capable of meeting restaurant and export demand, and unsatisfactory fish classified as grade 2. The selling price varies by type, grade 1 fish has an average selling price of 200,000 VND/kg and grade 2 fish has an average selling price of 100.00 VND/kg. The volume of mackerel purchased is classified by collectors and processing enterprises. All grades 1 are processed and exported by enterprises. Grade 2 fish are provided by collectors and processors to retailers for consumption in the domestic market. Survey results show that traders (collectors) almost play an important role in the process of purchasing and distributing fish products compared to processing enterprises. The relationship between the actors is quite loose, depending largely on the relationship and fluctuations of the market.

Fig. 1 shows that the fish value chain at the fishing port of Quang Binh province has four market channels, including:

- Channel 1: Fishermen directly catch fish → Traders (collectors) → Retailers → Domestic consumers.
- Channel 2: Fishermen directly catch fish → Traders (collectors) → Processing enterprises → Retailers → Domestic consumers.
- Channel 3: Fishermen directly catch fish → Traders (collectors) → Fish processing enterprises → Export.
- Channel 4: Fishermen directly catch fish → Fish processing enterprises → Export.

Out of the four market channels, there are two for domestic consumption and two for export. Accordingly, the first channel

fish is directly caught by fishermen, collected by traders, then transferred to retailers and then to domestic consumers in the province. In the second channel, fish are caught by fishermen, collected by traders, then transferred to processing enterprises, then to retailers and then to consumers outside the province. In the third channel, fish are caught, collected by traders and then transferred to processing enterprises for export. In the fourth channel, fish are directly caught by fishermen and processed by enterprises for export. The last channel is that fishermen directly catch fish and transfer them to fish processing enterprises and then export them.

B. Economic Analysis of Fish Value Chain at Fishing Port in Quang Binh Province

Cost of Fishermen Fishing

The costs of fishing fishermen are classified into two groups: intermediate costs and additional costs. The investment level and cost structure of fishermen are shown in Table III.

TABLE III
COST OF INDIVIDUAL FISHERMAN

Expense item	Amount (VND)	Rate (%)
Intermediary costs	80,000	53%
Fuel	47,000	31%
Other	33,000	22%
Cost increases (VA)	70,000	47%
Labor	50,000	33%
Interest	8,000	5%
Depreciation and amortization	10,000	7%
Other	2,000	1%
Total	150,000	100%

TABLE IV
BUSINESS PERFORMANCE OF AGENTS BY CHANNEL 2 (UNITS: 1000 VND/KG)

Content	Fishermen	Traders	Processing enterprises	Retailers	Total
Price	180	204	224	250	790
Total cost of fishing (TCP)	150	190	215	235	425
Intermediary Cost (CPTG)	80	100	120	125	365
Additional cost (CPTT)	70	90	95	110	433
Value Added (VA)	100	104	104	125	68
Net Value Added (LN)	110	114	129	140	
Net VAT/TCP	20%	7%	4%	6%	

Table III shows that among the costs that fishermen have to pay, labor costs are the highest, accounting for 33% of the remaining costs, followed by the cost of fuel accounting for 31% and the cost of depreciation of fixed assets accounting for 7% of the remaining costs. Specifically, the cost of labor per 1 kg is nearly 50,000 VND/kg followed by the costs of fuel and fixed asset depreciation at 47,000 VND/kg and 10.00 VND/kg, respectively. Thus, the average total cost for fishermen to exploit 1 kg of fish is 150,000 thousand VND.

Value added (VAT) is the difference between the production values (in this case, the selling price/kg) that each actor in the chain earns minus the intermediate costs. The net added value (also known as profit) of each agent is calculated by subtracting the added cost from VAT [1]. In the fish value chain at the

fishing port of Quang Binh province, there are two main market channels selected for analysis: channel 2 - representing the domestic market channel and channel 4 - representing the export market.

- Channel 2: Fishermen directly catch fish → Traders (collectors) → Processing enterprises → Retailers → Consumers outside the province.

The analysis results in Table IV show that the total value added by this market channel is 433,000 VND/kg, in which the retailer is the agent that generates the most value at 110,000 VND/kg (accounting for 29% of the total VAT). Traders and processing enterprises both account for 24% of total VAT. Fishermen only contribute 23% of total added value to the chain; The rest is generated by collectors, including traders, businesses and retailers.

In terms of net value added (economic profit), the fisherman gets the most profit, whereby the net value added of the fisherman is 30,000 VND/kg; accounting for 44%; the difference between traders and retailers is about 14,000 - 15.00 VND/kg, accounting for 21% - 22%; the rest belongs to processing enterprises.

The profit ratio (net VAT/TCP) achieved by the actors in the chain is: Fishermen catching 20%, traders 7%, SMEs 4%; and retailers at 6%. Through analysis, we find that the distribution of profits and profit rates among actors in the chain as above is quite reasonable; consistent with the time it takes to carry out the production and circulation of the product through the different stages of the chain.

IV. CONCLUSIONS & RECOMMENDATIONS

Fish is an important aquaculture object of the fisheries industry in Quang Binh province, bringing high economic efficiency to fishermen and other actors in the fish value chain. Fish products from Quang Binh province are consumed in two main market channels, namely domestic and export channels, in which the domestic market channel is the main one and creates the largest added value. Quang Binh still has a lot of potential to develop the phantasies industry through the renovation of the production organization model; building linkages in production and processing to diversify products; building product brands and developing foreign consumption markets. This is an important direction to improve competitiveness and sustainable development of the province's fish industry. Through this study, we propose some solutions as follows:

Fishing is considered an activity that brings high economic efficiency to fishermen, but the selling price of the product has a large difference between different types of fish and types of fish. Specifically, small fish cost only 50-100 VND/kg, while large fish cost from 180-300,000 VND/kg. Therefore, policy makers need to improve fishermen's knowledge about exploiting large-sized or mature fish, thereby improving product quality to add value to the product. Specifically, it is necessary to equip them with knowledge on selecting fish species with a small size up to the fishing age to bring higher economic value and protect smaller species. It is necessary to study the consumer market more closely, especially the export

market, to find out the preferences of the people of the exporting countries as well as to look for export opportunities in big fish consuming countries such as the US and Europe. In addition, there must be fish preservation technologies for domestic restaurant chains. By implementing European fishing standards EIC. To facilitate the profession of Quang Binh in particular and Vietnam's fisheries in general, it is possible to officially export to developed countries such as Europe and the US.

Local authorities need to coordinate with the Agricultural Extension Center, Plant Protection Sub-Department, Department of Agriculture and Rural Development and relevant organizations to closely monitor the production and processing of products because this is an important factor create a brand of fish products. It is necessary to register for the construction of a geographical indication for Quang Binh fish products. Policymakers need to support processing enterprises and production households to promptly promote and introduce products on mass media and on the website of Quang Binh province. Fisheries organizations need to attend trade fairs, build a marketing team to promote marketing and communication activities. Fish product businesses need to develop foreign markets, especially the US, European and Chinese markets, where there is high and relatively stable demand for Vietnamese fish products.

ACKNOWLEDGMENT

We would like to sincerely thank the management board of Nhat Le fishing port for providing useful information and data to help us complete this research.

REFERENCES

- [1] Phan Phung Phu & Mai Van Xuan (2022). Analysis of the value chain of pangasius in Tien Giang province, *Science Journal of Hue University: Economics and Development*; ISSN: 2588-1205; eISSN: 2615-9716, Volume 131, Issue 5C, 2022, P. 183-196, DOI: 10.26459/hueunijed.v131i5C.6844.
- [2] Tien Giang Department of Agriculture and Rural Development (2022), Report on aquaculture situation in Quang Binh province.
- [3] Horvath, L. (2001), Collaboration: The key to value creation in supply chain management, *Supply Chain Management: An International Journal*, 6(5), 205-207.
- [4] Porter, Michael E. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*, New York.: Simon and Schuster, ISBN 9781416595847.
- [5] Ching Chyi Lee and Jie Yang (2000), "Knowledge Value chain", *Journal of Management Development*, Vol.19, No.9, p.783-793.
- [6] Gabriel, E. (2006), "Value Chain for Services - A new dimension of Porter's Value Chain". *The IMS International Journal*, Vol.34, p.1-30.
- [7] Quang Binh province fishing port management board (2022), financial report
- [8] Central Executive Committee of the Communist Party of Vietnam (2018), No. 36-NQ/TW, Eighth Conference of the Party Central Committee (term XII)