



Print ISSN: 1738-3110 / Online ISSN 2093-7717
 JDS website: <http://accesson.kr/jds>
<http://doi.org/10.15722/jds.22.06.202406.45>

Distribution of Product Value Chain: Do Farmers Receive the Lowest Benefits? The Case of Snubnose Pompano Fishery*

Duy Ngoc NGUYEN¹, Nga Thi NGUYEN², Ngoc Van NGUYEN³, Chau Minh HO⁴

Received: April 09, 2024. Revised: May 07, 2024. Accepted: June 05, 2024.

Abstract

Purpose: This study utilizes value chain analysis to investigate the distribution of benefits in the snubnose pompano product value chain, aiming to ascertain how these benefits are obtained by the farmers. **Research design, data and methodology:** The study approaches the assessment components from the economic analysis framework of the value chain. It investigates the various actors involved in the value chain of snubnose pompano fishery products in the South-Central Coast region of Vietnam from 2020 to 2022. Data collection is conducted through direct interviews with the actors utilizing survey questionnaires. **Results:** The results indicate that farmers, traders, and processors are key actors in the chain. The distribution of benefits between farmers and other actors has improved and tended towards greater harmony over the years. However, farmers receive benefits that are not commensurate with their value-added contribution. Farmers contribute the greatest value-added, but their profit margin share is not commensurate with the ratio of their value-added contribution to the chain. Farmers suffer the highest degrees of losses caused by price fluctuation and production risks, while other actors face smaller risks. **Conclusions:** The study offers some recommendations to adjust the distribution of benefits and risks among participants in this value chain.

Keywords : Benefit Distribution, South Central Coast, Snubnose Pompano, Value Chain, Vietnam.

JEL Classification Code: D29, D49, L11, Q12

1. Introduction

The coastal area of the South-Central region in Vietnam, comprising five provinces including Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, and Binh Thuan, possesses numerous advantages and potentials for the development of marine fish farming. In recent years, the snubnose pompano

(*Trachinotus blochii*, Lacepede 1801) has emerged as a popular aquaculture species in this region. Recognized for its high economic value, ease of cultivation, relatively rapid growth, and favorable response to commercial feed, the snubnose pompano has become the primary species for cage aquaculture. Consequently, it is increasingly sought after to meet both domestic consumption and export demands.

* This research is funded by a project under the Vietnamese Ministry of Education and Training's Science and Technology Program, with grant number CT 2022.05.TSC.07. The authors are grateful to Editor-in-chief Hee-Joong Hwang, and two anonymous reviewers for providing valuable comments and advice on paper.

1 First Author and Corresponding Author. Vice Dean of Faculty of Economics, Nha Trang University, Vietnam.
 Email: nguyennngocduy@ntu.edu.vn

2 Second Author. Lecturer, Faculty of Economics, Nha Trang University, Vietnam, Email: ngant@ntu.edu.vn

3 Third Author. Lecturer, Faculty of Economics, Nha Trang University, Vietnam, Email: ngocnv@ntu.edu.vn

4 Fourth Author. Ph.D. student, Faculty of Economics, Nha Trang University, Vietnam, Email: asia96hmc@gmail.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

However, the production and distribution of snubnose pompano products suffer from a lack of tight coordination and harmonized benefits among stakeholders. These products also encounter stringent market requirements concerning quality, food safety, source traceability, environmentally friendly production practices, and price fluctuations. Additionally, challenges related to management policies, planning, and cultivation control pose significant obstacles to the sustainable development of the snubnose pompano product value chain in the South-Central coastal region.

This study aims to explore the relationships among actors in the value chain of snubnose pompano products and the distribution of benefits among these actors. Based on this examination, policy suggestions are proposed to regulate and harmonize benefit relationships among the chain's actors. Previous studies have indicated that marine fish farmers often receive disproportionately low benefits in the value chain, as evidenced by studies on red snapper products in the South Central coastal region (Nguyen & Tran, 2019). Understanding whether farmers of snubnose pompano face similar challenges constitutes one of the primary objectives of this study. The asymmetric distribution of benefits among actors is known to significantly impact the sustainable development of the value chain (Roheim, 2005; Nguyen et al., 2012, 2014).

We find that the distribution of benefits among farmers and other actors has shown signs of improvement and increased balance from 2020 to 2022. Farmers exhibit the highest average value-added contribution ratio in the export chain, and their profit per kilogram of fish closely approximates that of the processors. Their profit margin share in the chain has progressively narrowed the disparity relative to other actors over this period. However, we also find that farmers have not received equitable benefits commensurate with their substantial contribution to the chain. Despite being the primary value-adding entities, their profit margin share fails to align proportionately with their value contribution. The actors in the chain have yet to establish close connections and effective cooperation mechanisms to equitably distribute long-term benefits and risks. These are important findings to recommend policies for sustainable development and enhancing the competitive position of the snubnose pompano product value chain in the global value chain.

The remainder of this paper is organized as follows: Section 2 presents the theory and literature review, followed by methodology in Section 3. The empirical results are presented in Section 4. Finally, the key features of the results are discussed in Section 5, and the concluding remarks and implications are highlighted in Section 6.

2. Theory and Literature Review

2.1. Theoretical Framework

The value chain encompasses a range of activities aimed at delivering a product to the ultimate consumer through various stages of production, value enhancement, and distribution processes (Kaplinsky & Morris, 2001). According to Gudmundsson's delineation (2006), a typical seafood product value chain encompasses activities such as production (via fishing, aquaculture, or a combination thereof), primary processing, secondary processing, distribution, marketing, and ultimately consumption. De Silva (2011) observed that the seafood product value chain involves a diverse array of actors including farmers/fishermen, intermediate buyers, processors, importers, wholesalers, and retailers, all contributing to the value creation of the final seafood product for the end consumer. A seafood product value chain may encompass numerous or few value-adding processes and involve a multitude or few actors, yet each process serves to incrementally enhance the value of the final product delivered to the consumer.

The research employs an economic analysis approach to value chain analysis in order to examine the distribution of benefits among the actors. In accordance with Springer-Heinze (2007), the economic analysis of value chains comprises the following assessment components:

- (i) Total value added: Assessing the overall value added produced by the value chain and discerning the proportions of contribution from different stages.
- (ii) Production and marketing costs: Examining production and marketing expenses at each stage in the value chain and delineating the cost structure in each stage.
- (iii) Economic performance of actors: Appraising the economic performance of actors involved in the value chain.

The value added by an actor in the value chain for a unit of product is determined as the disparity between the selling price of the product and the cost of input factors procured from other actors in the preceding phase. Additionally, costs associated with intermediate goods obtained from suppliers who are not active participants in the chain are encompassed in the calculation of value added. Consequently, the aggregate value of the entire chain comprises the cumulative value added by each actor along the chain, alongside the value added contributed by external service providers and goods suppliers who are not direct participants in the chain (Springer-Heinze, 2007).

In instances where the value added for each actor is not explicitly delineated, selling prices can serve as a proxy to assess the additional value generated vertically in the chain in the economic analysis of the value chain (Kaplinsky & Morris, 2001). Additional value encompasses production costs, marketing costs (or incremental costs), and profits

accruing to each actor in the chain. An analysis of additional value facilitates the determination of the economic value generated for the ultimate consumer by each actor and for the entire value chain as a whole (Kaplinsky & Morris, 2001; Springer-Heinze, 2007).

2.2. Literature Review

Numerous studies have investigated the aquaculture value chain globally. Macfadyen et al. (2012) conducted a thorough value-chain analysis of the Egyptian aquaculture sector. Their study aimed to map the value chain for pond-farmed fish, delineate the primary stakeholders and product flow, comprehend costs and earnings profiles, assess financial performance across various sub-sectors/links, and pinpoint key constraints and issues affecting different actors within the Egyptian aquaculture value chain. Lim (2016) scrutinized the Singaporean aquaculture industry through an integrated approach, drawing from both the global value chain and global production network perspectives. Pomeroy et al. (2017) undertook a value chain analysis to scrutinize the linkages and trust between small-scale aquaculture producers and traders in Asia. Their objective was to gain a better understanding of the constraints and opportunities faced by small-scale producers. The study offers response strategies aimed at enhancing the sustainability and competitiveness of the entire value chain and its constituent actors. Bush et al. (2019) identified five themes emerging from research on aquaculture value chains: multi-polarity, diversity and scale, dynamics of transformation, performance and equity, and technical and institutional innovation. They affirmed the necessity for more diverse future research on value chains to elucidate the ongoing development of the aquaculture sector and to contribute to the sustainable expansion of the global food system. Ali et al. (2023) explored the feed supply segment of the aquaculture value chain in Bangladesh. Their findings indicate that feed trader profit margins are modest, and traders seem to alleviate credit constraints for farms by offering credit in-kind. The feed supply segment of the aquaculture value chain in Bangladesh is dynamic, well-developed, competitive, and efficient. Yildırım (2023) analyzed trout and sea bream/sea bass value chains in Turkey, estimating the overall efficiency of the value chains by market type, and comparing the profit margins and individual efficiency levels of producers, wholesalers, and retailers within each value chain.

Numerous studies have explored benefit distribution in the value chain of seafood products, with notable contributions from projects conducted by the Food and Agriculture Organization (FAO) and the United Nations Industrial Development Organization (UNIDO). Gudmundsson (2006) conducted an evaluation of benefit

distribution among actors in seafood value chains across various fisheries worldwide. Within the purview of FAO research initiatives, De Silva (2011) undertook a comprehensive study of the global value chain of marine fishery products spanning multiple countries. FAO (2011) conducted research on the value chains of aquaculture and inland fisheries products in Cambodia, highlighting that aquaculture farmers and fishermen often encounter significant disadvantages in the value chain.

Kassam and Dorward (2017) examined the distribution of economic benefits arising from participation in Ghana's aquaculture value chains. They estimated local economic multipliers generated in Ghana's rural non-farm economy by different types of aquaculture, accounting for both employment and incomes generated on-farm and via 'production linkages' that create demand for products and services above and below the farm in the chain. Ali et al. (2018) assessed the effects of interventions aimed at improving the performance of aquaculture value chains, focusing on Bangladesh and Nepal. These studies employed analytical frameworks proposed by Gereffi (1994; 1999), Gereffi and Korzeniewicz (1994), and Kaplinsky and Morris (2001) to evaluate benefit distribution among participants in the value chain.

In Vietnam, studies conducted by Thai et al. (2008) and Nguyen and Vo (2014) have employed the Structure-Conduct-Performance (SCP) model to ascertain the distribution of benefits among actors in the value chain of pangasius products in the Mekong Delta region. Findings from these studies indicate that pangasius farmers receive lower benefits and face heightened risks compared to other actors in the chain. Additionally, Nguyen et al. (2012) utilized the SCP model to examine the balance of benefits between fishermen and other actors in the value chain of striped tuna in the Khanh Hoa market. Moreover, Nguyen et al. (2014) applied the value chain analysis approach proposed by Kaplinsky and Morris (2001) and Springer-Heinze (2007) to analyze benefit distribution in the value chain of marine fishery products. The outcomes of these investigations revealed an imbalance in benefit distribution in the marine fishery value chain, with fishermen contributing the highest value added to the chain yet experiencing the lowest profit margins.

Applying the methodology outlined by Springer-Heinze (2007), Nguyen and Tran (2019) undertook an analysis of benefit distribution among actors in the supply chain of red snapper products in the South-Central Coast region of Vietnam. The research findings highlight that the value chain of this marine farming product distributes benefits among participating actors asymmetrically, with fish farming households contributing significantly to value added but receiving minimal benefits.

In conducting an analysis of benefit distribution among

actors in the value chain, the aforementioned studies employed specific approaches tailored to their research objectives and subjects. However, there is currently a dearth of research on the benefit distribution in the value chain of snubnose pompano products in the coastal areas of South-Central Vietnam. It remains unexplored whether snubnose pompano fish farming farmers also face numerous risks and receive few benefits. Based on the previous studies above in Vietnam, a reasonable hypothesis here is that the snubnose pompano farmers receive the lowest benefits despite their large value-added contribution. If this hypothesis is accepted, it suggests that the value chain of snubnose pompano products lacks an ecosystem of shared value, wherein benefits are distributed equitably among actors. Conversely, it implies that the actors in the chain understand collective-impact efforts for an ecosystem of shared value (Kramer & Pfitzer, 2016). Shared value in the value chain results from policies and practices that contribute to a competitive advantage while strengthening the communities in which actors operate (Kramer & Pfitzer, 2016).

3. Methodology

3.1. Analytical method

This study adopts the analytical method delineated by Springer-Heinze (2007), which has also been utilized in the research conducted by Nguyen et al. (2014) and Nguyen and Tran (2019). The analytical content and calculation methods are outlined as follows:

- Determination of the structure of the snubnose pompano value chain: This involves identifying the actors in the chain, mapping out the linkages between them, and elucidating the flow of the product.

- Calculation of the distribution ratio of purchase and sales quantities in the chain: This step entails determining the ratio of the average distribution over a three-year period based on the annual average purchase and sales quantities of each actor at each stage. During the calculations, the quantities of the final products are uniformly converted to raw materials.

- Computation of costs and profits: Unified conversion is employed to calculate the average cost and profit data for each actor over a three-year period. These values are expressed in unit value per kilogram of raw fish.

- Total costs encompass the production cost (or purchase price from the previous actor) and incremental costs (or marketing costs).

- Profit is determined as the revenue minus the total costs.

- The profit-to-total cost ratio is calculated as the profit divided by the total costs.

- The profit-to-incremental cost ratio is calculated as the profit divided by the incremental cost.

- To analyze the distribution of benefits, in addition to the previously mentioned indicators, the study incorporates the following two additional measures:

- Value-added contribution ratio: This ratio is computed as the difference between the selling price to the subsequent actor and the purchase price from the previous actor, divided by the purchase price from the final actor in the channel.

- Profit margin share: This metric is calculated by dividing the profit of the actor by the total profit of all actors in the channel.



Source: Recreated by the authors from the Administrative Map of Vietnam on the Vietnam Government Portal (2024)

Figure 1: Map of South Central Vietnam showing Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, and Binh Thuan provinces, the major producers of snubnose pompano.

3.2. Data

The study investigates the various actors involved in the value chain of snubnose pompano products in the coastal provinces of South-Central Vietnam, encompassing Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, and Binh Thuan (see Figure 1). The surveyed actors include farmers, intermediaries (such as traders), processing and exporting companies (hereinafter referred to as processing companies or processors), wholesalers, and retailers. Data for the study were collected over a three-year period spanning from 2020

to 2022. Data collection is conducted through direct interviews with the actors utilizing survey questionnaires. The study adopts a convenience sampling method to ensure proportional representation of each group of actors participating in the snubnose pompano value chain in the South-Central Coast region. Table 1 provides an overview of the number of observations surveyed in each province. In total, there were 250 respondents for the survey. Khanh Hoa province had the highest number of respondents, accounting for 50% of the total observations and encompassing all actors in the chain.

Table 1: The Number of Observations in the Survey Sample

Actors	Provinces					Total
	Binh Thuan	Ninh Thuan	Khanh Hoa	Phu Yen	Binh Dinh	
Farmers	14	14	58	50	14	150
Processing companies	03	0	14	01	02	20
Traders	03	04	09	02	02	20
Wholesalers	02	01	09	02	01	15
The retailers group consists of restaurants and hotels	0	0	30	0	0	30
The retailers group consists of supermarkets, stores, and retailers at traditional markets	03	02	06	02	02	15
Total	25	21	126	57	21	250

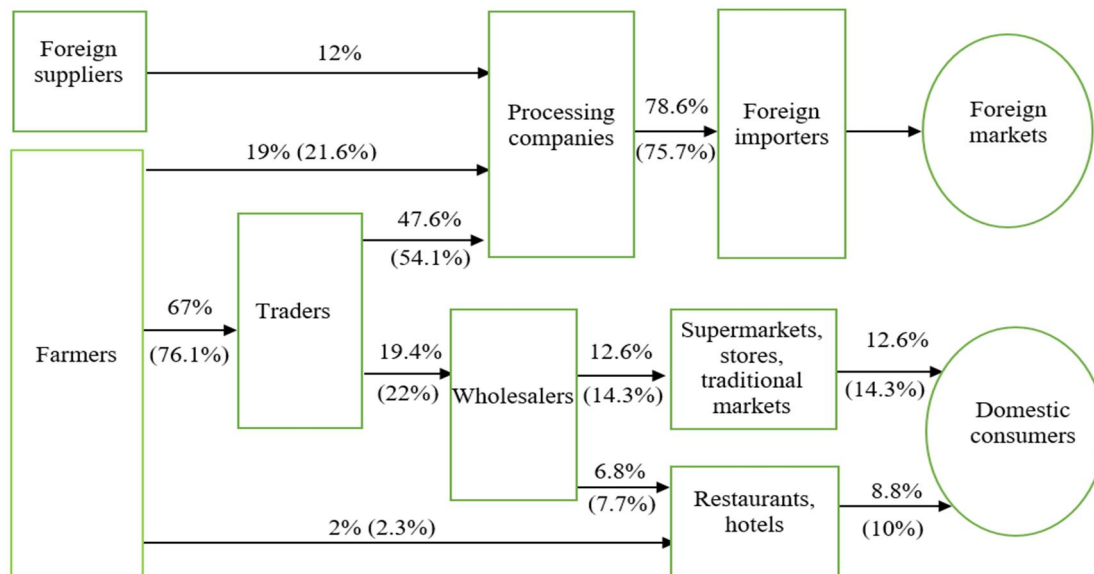
Source: Own data and statistics

4. Results

4.1. Structure of the Snubnose Pompano Value Chain

pompano value chain in the South-Central Coast region. The distribution of snubnose pompano products to the market is facilitated through two primary channels: Channel 1 for export and Channel 2 for domestic consumption.

Figure 2 illustrates the structure of the snubnose



Note: The numbers in parentheses are calculated based on the total aquaculture production of the farmers
 Source: Own survey and calculation (2020-2022)

Figure 2: The Value Chain of Snubnose Pompano Products in the South Central Coast, Vietnam

Channel 1 comprises two branches:

1a) Processing companies directly procure raw materials from domestic farmers, constituting 19% of the total quantities in the entire chain, and from foreign suppliers, accounting for 12%. These raw materials undergo processing to produce export products sold to foreign importers.

1b) Snubnose pompano products are traded from farmers to traders, processing companies, and foreign importers in the international market. This branch accounts for 47.6% of the total quantities in the entire chain, equivalent to 54.1% of the total production volume of farmers.

Channel 2 also includes two branches:

2a) Products flow from farmers to traders, wholesalers, both groups of retailers, and eventually to domestic consumers in the national market, representing 19.4% of the total volume of the entire chain (equivalent to 22% of the total production volume of farmers).

2b) Products move from farmers to retailers (comprising hotels and restaurants), and then to domestic consumers, accounting for 2% of the total volume (equivalent to 2.3% of the total production volume of farmers).

Farmers play a pivotal role as the primary actors in the production of snubnose pompano products destined for both export and domestic consumption markets. The farming process of snubnose pompano holds significant importance in generating value for farmers and other stakeholders in the chain. Traders serve as key participants in both distribution channels, catering to both domestic and export markets. Their purchases constitute approximately 67% of the total volume of the entire chain, which is equivalent to 76.1% of the total production volume of farmers. Traders create value through their buying and selling activities involving snubnose pompano products.

Processing companies acquire 78.6% of the snubnose pompano raw material volume in the chain, sourcing from traders (47.6%), farmers (19%), and foreign suppliers (12%). They exert substantial pricing control over both traders and farmers. Processed snubnose pompano products are predominantly supplied to foreign importers. Wholesalers serve as intermediaries bridging the gap between traders and retailers. Their value creation lies in the buying and selling of snubnose pompano products with retailers.

Retailers are actors directly catering to final consumers in the domestic market. Approximately 21.4% of the snubnose pompano volume in the entire chain is consumed in the domestic market, equivalent to 24.3% of the total production of farmers.

4.2. Analysis of Costs and Profits of the Actors

Costs and profits for each actor in each channel are detailed in Tables 2 and 3. Snubnose pompano farmers attain

varying profit levels when selling to different actors. In 2020, farmers realized an average profit of 31,000 Vietnamese Dong (VND)/kg when selling directly to processing companies, and 23,000 VND/kg when selling to traders or retailers such as restaurants and hotels. However, in 2021 and 2022, farmers achieved profits of 42,000 VND/kg when selling to processors, and 33,000 - 34,000 VND/kg when selling to traders as well as restaurants and hotels (see Tables 2 and 3). Their profit-to-total cost ratio is highest when selling to processors. Overall, the profit and profit margins of farmers increased over the three-year period across the distribution channels in the chain.

Traders incur relatively modest incremental costs, constituting approximately 4-5% of their total costs. Their profit per kilogram of fish when selling to processors increases over the three-year period due to the ascending selling price. Roughly 71% of the snubnose pompano volume acquired by traders (equivalent to 47.6% of the total volume in the chain) is distributed through the processing companies. The profit traders accrue when selling to wholesalers is marginally lower than when selling to processing companies. This channel only represents 19.4% of the total fish volume in the whole chain, corresponding to 29% of the fish volume purchased by traders.

The processing companies experience lower incremental costs when acquiring raw materials from traders in comparison to procuring directly from farmers. As a result of the lower purchase price of raw materials from farmers relative to traders, the companies achieve higher profit per kilogram of fish and profit rates on total costs when procuring raw materials directly from farmers. The average profit per kilogram of fish for the companies in 2022 is 43,000 VND/kg and 32,000 VND/kg when purchasing snubnose pompano from farmers and traders, respectively (refer to Table 2). Consequently, the average profit per kilogram obtained by traders when selling to wholesalers is lower than when selling to the processing companies. This disparity arises from variations in the selling prices of snubnose pompano fish and procurement costs. Despite incurring additional transportation expenses for delivery to the processing companies, traders receive higher selling prices from the processing companies compared to wholesalers. Furthermore, the processing companies' higher purchase volume results in higher total profits for traders over the years when selling to the processing companies as opposed to wholesalers.

For wholesalers, the majority of their incremental costs primarily comprise storage and transportation expenses, totaling approximately 3,000 VND per kilogram of purchased fish. Consequently, their profit-to-incremental cost ratio is notably high, reaching 166.7% in 2022 (refer to Table 3). Over the past three years, restaurants and hotels have witnessed an increase in average profits. They attain

higher profits when procuring snubnose pompano directly from farmers in comparison to purchasing from wholesalers. Restaurants and hotels procure a larger volume from

wholesalers than from farmers as wholesalers ensure swift delivery of fish to their premises.

Table 2: Benefit Distribution Among the Actors in the Export Channel

Year	Indicators	Channel 1a		Channel 1b		
		Farmer	Processing company	Farmer	Trader	Processing company
2020	Selling price (1,000 VND/kg)	150	260	142	170	260
	Total costs (1,000 VND/kg)	119	220	119	149	227.2
	Incremental costs (1,000 VND/kg)	0	70	0	7	57.2
	Profit (1,000 VND/kg)	31	40	23	21	32.8
	Profit-to-total cost ratio	26.1%	18.2%	19.3%	14.1%	14.4%
	Profit-to- incremental cost ratio	-	57.1%	-	300.0%	57.3%
	Value-added contribution ratio	57.7%	42.3%	54.6%	10.8%	34.6%
	Profit margin share	43.7%	56.3%	29.9%	27.3%	42.7%
2021	Selling price (1,000 VND/kg)	150	265	142	172	265
	Total costs (1,000 VND/kg)	108	222	108	149	231.2
	Incremental costs (1,000 VND/kg)	0	72	0	7	59.2
	Profit (1,000 VND/kg)	42	43	34	23	33.8
	Profit-to-total cost ratio	38.9%	19.4%	31.5%	15.4%	14.6%
	Profit-to- incremental cost ratio	-	59.7%	-	328.6%	57.1%
	Value-added contribution ratio	56.6%	43.4%	53.6%	11.3%	35.1%
	Profit margin share	49.4%	50.6%	37.4%	25.3%	37.2%
2022	Selling price (1,000 VND/kg)	151	270	142	175	270
	Total costs (1,000 VND/kg)	109	227	109	150	238
	Incremental costs (1,000 VND/kg)	0	76	0	8	63
	Profit (1,000 VND/kg)	42	43	33	25	32
	Profit-to-total cost ratio	38.5%	18.9%	30.3%	16.7%	13.4%
	Profit-to- incremental cost ratio	-	56.6%	-	312.5%	50.8%
	Value-added contribution ratio	55.9%	44.1%	52.6%	12.2%	35.2%
	Profit margin share	49.4%	50.6%	36.7%	27.8%	35.6%

Source: Own survey and calculation (2020-2022)

On the other hand, the retail group, which encompasses supermarkets, stores, and retailers at traditional markets, incurs minimal incremental costs in their total expenses, amounting to approximately 2,000 VND per kilogram. Consequently, they exhibit the lowest profit-to-incremental cost ratio in the value chain.

4.3. Benefit Distribution in the Value Chain of Snubnose Pompano Products

The distribution of benefits among the actors exhibits variation, as demonstrated by the value-added contribution

ratio and the profit margin share in the value chain (see Tables 2 and 3). In branch 1a of the export channel (farmer - processing company - foreign importer), the results reveal that farmers possess a higher contribution ratio to value-added (57.7%) in comparison to the processing companies (42.3%) in 2020. However, the profit margin share in the chain for farmers stands at 43.7%, which is lower than the 56.7% for the processors (see Table 2). The contribution ratio to value-added of farmers slightly diminishes in the subsequent two years (reaching 55.9% in 2022), yet their profit margin share increases to nearly equal that of the processors.

Table 3: Benefit Distribution among the Actors in the Domestic Channel

Year	Indicators	Channel 2a					Channel 2b	
		Farmer	Trader	Wholesalers	Restaurants, hotels	Supermarkets, stores, traditional markets	Farmer	Restaurants, hotels
2020	Selling price (1,000 VND/kg)	142	168	175	300	190	142	300
	Total costs (1,000 VND/kg)	119	149	171	230	177	119	197
	Incremental costs (1,000 VND/kg)	0	7	3	55	2	0	55

Year	Indicators	Channel 2a					Channel 2b	
		Farmer	Trader	Wholesalers	Restaurants, hotels	Supermarkets, stores, traditional markets	Farmer	Restaurants, hotels
	Profit (1,000 VND/kg)	23	19	4	70	13	23	103
	Profit-to-total cost ratio	19.3%	12.8%	2.3%	30.4%	7.3%	19.3%	52.3%
	Profit-to- incremental cost ratio		271.4%	133.3%	127.3%	650.0%		187.3%
	Value-added contribution ratio (through restaurants, hotels)	47.3%	8.7%	2.3%	41.7%	-	47.3%	52.7%
	Profit margin share (through restaurants, hotels)	19.8%	16.4%	3.4%	60.3%	-	18.3%	81.7%
	Value-added contribution ratio (through supermarkets, stores, traditional markets)	74.7%	13.7%	3.7%	-	7.9%	-	-
	Profit margin share (through supermarkets, stores, traditional markets)	39.0%	32.2%	6.8%	-	22.0%	-	-
2021	Selling price (1,000 VND/kg)	142	170	175	350	190	142	350
	Total costs (1,000 VND/kg)	108	149	173	235	177	108	202
	Incremental costs (1,000 VND/kg)	0	7	3	60	2	0	60
	Profit (1,000 VND/kg)	34	21	2	115	13	34	148
	Profit-to-total cost ratio	31.5%	14.1%	1.2%	48.9%	7.3%	31.5%	73.3%
	Profit-to- incremental cost ratio		300.0%	66.7%	191.7%	650.0%		246.7%
	Value-added contribution ratio (through restaurants, hotels)	40.6%	8.0%	1.4%	50.0%	-	40.6%	59.4%
	Profit margin share (through restaurants, hotels)	19.8%	12.2%	1.2%	66.9%	-	18.7%	81.3%
	Value-added contribution ratio (through supermarkets, stores, traditional markets)	74.7%	14.7%	2.6%	-	7.9%	-	-
Profit margin share (through supermarkets, stores, traditional markets)	48.6%	30.0%	2.9%	-	18.6%	-	-	
2022	Selling price (1,000 VND/kg)	142	170	178	380	195	142	380
	Total costs (1,000 VND/kg)	109	150	173	243	180	109	207
	Incremental costs (1,000 VND/kg)	0	8	3	65	2	0	65
	Profit (1,000 VND/kg)	33	20	5	137	15	33	173
	Profit-to-total cost ratio	30.3%	13.3%	2.9%	56.4%	8.3%	30.3%	83.6%
	Profit-to- incremental cost ratio		250.0%	166.7%	210.8%	750.0%		266.2%
	Value-added contribution ratio (through restaurants, hotels)	37.4%	7.4%	2.1%	53.2%	-	37.4%	62.6%
	Profit margin share (through restaurants, hotels)	16.9%	10.3%	2.6%	70.3%	-	16.0%	84.0%
	Value-added contribution ratio (through supermarkets, stores, traditional markets)	72.8%	14.4%	4.1%	-	8.7%	-	-
Profit margin share (through supermarkets, stores, traditional markets)	45.2%	27.4%	6.8%	-	20.5%	-	-	

Source: Own survey and calculation (2020-2022)

In branch 1b of the export channel (farmer - trader - processing company - foreign importer), farmers contribute the highest value-added. In 2020, the value-added contribution ratio of farmers is 54.6%, yet their profit margin share in this channel is markedly lower than that of the processors (at 29.9% compared to 42.7%). Throughout 2021 and 2022, the value-added contribution ratio of farmers decreases in comparison to 2020, although their profit margin share and that of the processing companies are roughly equivalent (hovering around 36% - 37%). Despite the profit margin share of farmers increasing over the three years, it does not proportionately align with their contribution to value-added in this channel. Traders

contribute the lowest value-added (approximately 11% in 2020 and 2021, and 17.2% in 2022), yet their profit margin share exceeds 27% each year (see Table 2).

The distribution of benefits in the supply channel for the domestic market is outlined in Table 3. In channel 2a, involving the distribution of products through supermarkets, stores, and retail sellers in traditional markets, farmers consistently contribute the highest value-added over the three-year period, ranging from 72% to 74%. Furthermore, farmers possess the highest profit margin share in this channel, reaching 45.2% in 2022. Traders, on the other hand, contribute significantly lower value-added compared to farmers (approximately 14-15%), yet their profit margin

share in this channel is notably high (around 27-30%). Traders bear almost negligible incremental costs and experience minimal risk as they typically vend fish to wholesalers during the procurement process. Retailers such as supermarkets, stores, and retail sellers in traditional markets attain the highest profit ratio on incremental costs, with their profit margin share ranging from approximately 18-22%, even though their value-added contribution ratio remains low.

For the distribution channel through restaurants and hotels, in 2020, farmers contributed the highest value-added, yet their profit margin share amounted to only 19.8%. Conversely, restaurants and hotels contributed lower value-added, but their profit margin share exceeded 60%. Throughout 2021 and 2022, restaurants and hotels consistently contributed the highest value-added and maintained the highest profit margin share.

In the channel where farmers sell directly to restaurants and hotels (channel 2b), the profit margin share of farmers slightly decreased, while that of restaurants and hotels increased significantly compared to channel 2a (refer to Table 3). In this channel, restaurants and hotels procure fish directly from farmers, thereby reducing their input fish purchase costs and resulting in higher profit margins for them.

5. Discussion

The research findings reveal that farmers, traders, and processing companies play pivotal roles in the value chain of snubnose pompano products in the South-Central Coast region. The export channel serves as the primary consumption pathway for the production of snubnose pompano by farmers, encompassing over 75% of their aquaculture output. Within this channel, farmers contribute the highest value-added; however, their profit margin share does not proportionally align with their value-added contribution to the value chain. Traders, on the other hand, contribute the lowest value-added, yet their profit margin share obtained in the export channel significantly exceeds their contribution to value-added. Nevertheless, the profit per kilogram of fish for farmers is nearly equal to that of processing companies. The profit ratio over total costs for farmers is the highest in the export chain. Furthermore, the profit margin share of farmers has narrowed compared to other actors over the years. In 2021 and 2022, the profit margin shares of farmers approximated those of the processing companies. These findings reject the hypothesis that the snubnose pompano farmers receive the lowest benefits despite their large value-added contribution.

Nguyen and Tran (2019) demonstrated that farmers contribute less value-added and profit margin share in the

value chain compared to processing companies when studying the case of the red snapper value chain in the South-Central Coast region of Vietnam. Consequently, there exists a disparity in the contribution rate of value-added and profit margin share between snubnose pompano farmers and red snapper farmers in the same region. This distinction may be attributed to the heightened demand for snubnose pompano products in the import market, which consequently drives up the output price for snubnose pompano farmers. However, snubnose pompano farmers face the highest risks in production, with their income heavily reliant on production volume and fish prices. In contrast, the price of the final product predominantly hinges on the market price in the export market, which is set by importers. Furthermore, the prices of input factors tend to escalate, and farmers often bear the brunt of production losses stemming from diseases, water pollution, and climate change. All these risks significantly impact their livelihood income.

The processing companies play a significant role in contributing to the value-added and possessing a considerable profit margin share in the snubnose pompano value chain. This affords them considerable influence in price determination and reaps numerous benefits. However, they also encounter various risks, including technical trade barriers in foreign markets, such as food safety standards and product traceability requirements, along with challenges in international trade competition. Furthermore, they face competitive pressures from other seafood export products. Despite their influential position, the bargaining power of processing companies is weaker compared to importers, rendering them vulnerable to price pressures.

Traders, on the other hand, enjoy a substantially larger profit margin share in the export channel relative to their value-added contribution. The incremental costs incurred by traders primarily encompass transportation and preservation expenses. While traders face lower risks compared to farmers and processing companies, they encounter challenges such as potential deterioration in fish quality during transportation and storage, which could adversely affect selling prices and profits. Moreover, traders are subject to the dominance of processors, as over 71% of their total purchase volume is supplied to processors. Nonetheless, in practice, traders' influence is on the rise, facilitated by their ability to procure significant volumes from farmers, accounting for approximately 76.1% of farmers' production volume. Consequently, many customers, both domestic and international, rely on traders for fish procurement.

The findings underscore a lack of tightly integrated relationships among actors in the export channel. Farmers have yet to establish close cooperation with processing companies or traders to ensure stability in production volume and prices. As a result, farmers often face price

pressures and do not receive equitable benefits commensurate with the value they contribute. This situation presents challenges in controlling quality and traceability in the chain. These observations echo with the findings of Nguyen and Tran (2019).

In the domestic consumption channel, farmers emerge as significant contributors to the value-added process and command the highest profit margin share when distributing snubnose pompano products through supermarkets, stores, and traditional market retailers. Furthermore, they exhibit the highest profit per kilogram of fish and the most favorable profit-to-total cost ratio. Consequently, the benefits accruing to farmers appear to be relatively commensurate with their contributions. This distribution channel encompasses approximately 14.3% of farmers' production volume. As the demand from domestic consumers for snubnose pompano products continues to rise, it presents a promising opportunity for farmers to expand their fish distribution through this channel.

In the distribution channel catering to restaurants and hotels, farmers occupy the second-highest position in terms of value-added contribution and profit margin share, trailing only behind restaurants and hotels themselves. Given that snubnose pompano products are transformed into high-value-added dishes for sale to final consumers, restaurants and hotels command better selling prices per kilogram of raw fish.

Traders emerge as the most advantageous actors in the domestic channel, enjoying a substantially higher profit margin share relative to their value-added contribution. Additionally, their profit-to-incremental cost ratio is notably high, and they encounter minimal risks in this channel. Traders' advantage lies in their ability to trade large volumes and wield considerable bargaining power. Conversely, wholesalers and retailers, including supermarkets, stores, and traditional market retailers, exhibit high profit-to-incremental cost ratios. However, they contend with price pressures from both suppliers and consumers, alongside fluctuations in market demand.

6. Conclusions and Implications

The farmers, along with processing companies, and traders, are pivotal actors in the snubnose pompano value chain in the South-Central Coast region of Vietnam from 2020 to 2022. The distribution of benefits among farmers and other actors has shown signs of improvement and increased balance over this period. Farmers exhibit the highest average value-added contribution ratio in the export chain, and their profit per kilogram of fish closely approximates that of the processors. Moreover, their profit margin share in the chain has progressively narrowed the

disparity relative to other actors over the three-year timeframe. However, farmers have not received equitable benefits commensurate with their substantial contribution to the chain. Despite being the primary value-adding entities, their profit margin share fails to align proportionately with their value contribution. Furthermore, farmers endure the highest production risks. The actors in the chain have yet to establish close connections and effective cooperation mechanisms to equitably distribute long-term benefits and risks, hindering the establishment of a sustainable value chain.

Based on the findings, the study proposes several policy implications:

1) Establishment of vertical and horizontal cooperation models: Implementing vertical and horizontal cooperation models in the value chain of snubnose pompano products in the South-Central Coast region is imperative. Vertical cooperation can be facilitated by processing companies acting as central entities, while horizontal linkages can be formed by organizing small-scale farming units into larger production organizations. The operational framework of these models should be based on economic contracts between stakeholders (e.g., farmers and processors, farmers and traders, and traders and processors). Relevant entities such as quality licensing organizations, insurance agencies, banks, and research institutes should engage in supporting stakeholders through cooperative contracts. These contracts establish clear responsibilities and obligations among parties involved. Binding commitments in contracts are essential to ensure uniform cooperation in pricing, uphold quality and food safety standards throughout farming, purchasing, distribution, processing, and source tracing. This implication aims to enhance collaboration and coordination among stakeholders in the snubnose pompano value chain, facilitating efficient operations, quality assurance, and mutual benefits for all involved parties. These can create a sufficiently robust market ecosystem, based on a collective-impact approach.

2) Fostering stronger collaboration, transparency, and support among actors:

- Farmers' cooperation: Farmers should take proactive steps to establish vertical linkages with other stakeholders in the value chain, facilitating their access to market price information for both input and output factors. They should voluntarily form connections with one another and collaborate across all aspects of snubnose pompano farming activities to enhance the efficiency of production, product supply, disease prevention, treatment, and environmental management.

- Commitment from traders: Traders need to demonstrate a commitment to transparency by providing clear and accurate information regarding prices, as well as offering specific production support to farmers, such as upfront

funding and ensuring the quality preservation of purchased snubnose pompano for processing companies and wholesalers. Additionally, they should pledge to facilitate swift and efficient supply chains between farmers and processing companies.

- Commitment from processing companies: Processing companies must commit to ensuring the purchase of snubnose pompano products at fair and stable prices from both farmers and traders. They should provide various forms of support, including financial assistance, technical expertise, quality assurance, and traceability measures. Furthermore, processing companies should promptly update and disseminate market information to traders and farmers to facilitate informed decision-making. Establishing contractual agreements with relevant agencies, such as insurance organizations, credit institutions, research institutions, and quality licensing authorities, can further support the provision of essential services throughout the value chain. Prioritizing investments in innovative production lines, modern processing equipment, and advanced technologies is crucial to improving product quality. Additionally, focusing on processing high-value-added products that align with consumer preferences in export markets can enhance market competitiveness and profitability for them.

- Wholesalers and retailers' engagement: Wholesalers and retailers seeking to maximize their benefits from snubnose pompano trading should proactively engage in vertical and horizontal linkages in the value chain. By establishing tight and efficient connections with other actors, such as farmers, traders, and processing companies, wholesalers and retailers can swiftly access information about prices and market requirements. This enables them to make informed decisions and adapt their strategies accordingly. Additionally, restaurants and hotels should invest in research and development to create a diverse range of appealing dishes featuring snubnose pompano. This innovation can help stimulate consumer demand for snubnose pompano products, thereby increasing sales and profitability for wholesalers, retailers, and other stakeholders in the value chain.

3) Government and regulatory agencies support: The government and relevant authorities play a crucial role in supporting the development of the snubnose pompano industry through policy mechanisms aimed at fostering a value chain management approach. They should actively support processors in participating in vertically cooperative models, facilitating close linkages and equitable sharing of benefits with other stakeholders. Additionally, the government should direct relevant agencies to collaborate with stakeholders in the value chain to ensure effective coordination and communication. Aquaculture associations have a responsibility to develop plans to mobilize and

disseminate information to their members and the snubnose pompano farming community, promoting the establishment of linkages and equitable sharing of benefits and risks throughout the production and distribution processes. Furthermore, governmental agencies should enhance awareness, guidance, and support for snubnose pompano farmers and traders in post-harvest fish preservation techniques and source traceability measures to meet high market demands and ensure product quality and safety.

The current study primarily emphasizes the economic analysis of the snubnose pompano value chain, with less emphasis on social and environmental aspects. Additionally, several competitiveness-related issues in the snubnose pompano industry, including barriers to entry and exit, transactional factors, information exchange, and payment mechanisms, have not been thoroughly addressed. Future research will aim to explore these aspects to provide more comprehensive policy implications for the sustainable development of the snubnose pompano value chain in the South-Central Coast region of Vietnam. In addition, future research should evaluate the innovation performance of the value chain. Using the frameworks of the innovation value chain, we can gain an end-to-end view of innovation efforts across the entire chain, enabling us to pinpoint the weakest links and tailor innovation best practices appropriately to strengthen those links (Hansen & Birkinshaw, 2007; Kassam & Dorward, 2017; Asche, 2018; Ambos et al., 2021).

References

- Ali, H., Upraity, V., Gurung, S., Dhar, G. C., & Belton, B. (2018). Making sense of the market: Assessing the participatory market chain approach to aquaculture value chain development in Nepal and Bangladesh. *Aquaculture*, 493(2018), 395-405. <https://doi.org/10.1016/j.aquaculture.2017.06.003>.
- Ali, H., Belton, B., Haque, M. M., & Murshed-e-Jahan, K. (2023). Transformation of the feed supply segment of the aquaculture value chain in Bangladesh. *Aquaculture*, 576(2023), 739897. <https://doi.org/10.1016/j.aquaculture.2023.739897>.
- Asche, F., Cojocar, A. L., & Roth, B. (2018). The development of large scale aquaculture production: A comparison of the supply chains for chicken and salmon. *Aquaculture*, 493(2018), 446-455. <https://doi.org/10.1016/j.aquaculture.2016.10.031>.
- Ambos, B., Brandl, K., Perri, A., Scalera, V. G., & Van Assche, A. (2021). The nature of innovation in global value chains. *Journal of World Business*, 56(4), 101221. <https://doi.org/10.1016/j.jwb.2021.101221>.
- Bush, S. R., Belton, B., Little, D. C., & Islam, M. S. (2019). Emerging trends in aquaculture value chain research. *Aquaculture*, 498(2019), 428-434. doi:10.1016/j.aquaculture.2018.
- De Silva, D. A. M. (2011). Value chain of fish and fishery products: origin, functions and application in developed and developing country markets. In FAO (2012), *Value-chain in small scale fisheries*, Value-chain bibliography, Food and Agriculture

Organization.

- FAO (2011). *Fishery value chain analysis in Cambodia*. Food and Agriculture Organization, Rome, Italy.
- Gereffi, G. (1994). The Organization of buyer-driven global commodity chains: How US retailers shape overseas production networks. In G. Gereffi & M. Korzeniewicz (Eds.), *Commodity Chains and Global Capitalism*. Praeger, London.
- Gereffi, G. (1999). A commodity chains framework for analyzing global industries. *Institute of Development Studies*, 8(12), 1-9.
- Gereffi, G., & Korzeniewicz, M. (Eds.). (1994). *Commodity chains and global capitalism*. London: Praeger.
- Gudmundsson, E., Asche, F., & Nielsen, M. (2006). *Revenue distribution through the seafood value chain*. FAO Fisheries Circular, No. 1019. Rome, FAO. 42p.
- Hansen, M. T., & Birkinshaw, J. (2007). The innovation value chain. *Harvard business review*, 85(6), 121-130.
- Kaplinsky, R., & Morris, M. (2001). *A Handbook for Value Chain Research*. The Institute of International Development Research Center (IDRC), Ottawa, Canada.
- Kassam, L., & Dorward, A. (2017). A comparative assessment of the poverty impacts of pond and cage aquaculture in Ghana. *Aquaculture*, 470(2017), 110-122. <https://doi.org/10.1016/j.aquaculture.2016.12.017>.
- Kramer, M. R., & Pfitzer, M. W. (2016). The ecosystem of shared value. *Harvard business review*, 94(10), 80-89.
- Lim, G. (2016). Value chain upgrading: Evidence from the Singaporean aquaculture industry. *Marine Policy*, 63(2016), 191-197. <https://doi.org/10.1016/j.marpol.2015.03.016>.
- Macfadyen, G., Nasr-Alla, A. M., Al-Kenawy, D., Fathi, M., Hebicha, H., Diab, A. M., Hussein, S.M, Abou-Zeid, R.M, & El-Naggar, G. (2012). Value-chain analysis—An assessment methodology to estimate Egyptian aquaculture sector performance. *Aquaculture*, 362(2012), 18-27. <https://doi.org/10.1016/j.aquaculture.2012.05.042>.
- Nguyen, N. D., Nguyen, T. K. A., & Nguyen, T. T. A. (2012). Balancing Benefits between Fishermen and Actors in Value Chains of Capture Fish Products: The Case of Skipjack Tuna in Khanh Hoa. *Science and Technology Journal of Agriculture and Rural Development*, 6(2012), 11-19 (In Vietnamese).
- Nguyen, N.D., Nguyen, T. K. A., & Phan, L. D. H. (2014). Benefit distribution of value chain: the case of marine fishing products in Khanh Hoa. *Economics Development Journal*, 280 (02/2014), 78-96 (In Vietnamese).
- Nguyen, T. N., & Tran, D. T. (2019). Distribution of benefits in the supply chain of red snapper products in Central South Vietnam. *Journal of Economics and Development*, 263(5/2019), 63-73 (In Vietnamese).
- Nguyen, V.T., & Vo T. D. (2014). Vietnam's pangasius market - income distribution in the chain - production cost of raw pangasius - industry development solutions. *Journal of Science, Can Tho University*, 32(2014), 38-44 (In Vietnamese).
- Pomeroy, R., Navy, H., Ferrer, A. J., & Purnomo, A. H. (2017). Linkages and Trust in the Value Chain for Small-scale Aquaculture in Asia. *Journal of the World Aquaculture Society*, 48(4), 542-554. <https://doi.org/10.1111/jwas.12407>.
- Roheim, C.A. (2005). Seafood: Trade Liberalization and Impacts on Sustainability. In Aksjoy, M.A. and Beghin, J.C. (eds). *Global Agricultural Trade and Developing Countries*. The World Bank, Washington, DC, USA.
- Springer-Heinze, A. (2007). *ValueLinks manual: The methodology of value chain promotion* (1st ed.). Eschborn, Germany: GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit GmbH).
- Thai V. D., Luu T. T., & Luu T. D. H. (2008). Analysis of market structure and marketing channels: The case of catfish and tilapia in the Mekong Delta. In: *Foundation for the development of small and medium-sized enterprises and farming households in the Mekong Delta*. Edited by Mai Van Nam, NPT/VNM/013 Program, Education Publishing House, 2008, pp. 126-141.
- Vietnam Government Portal (2024). The Administrative Map of the Socialist Republic of Vietnam. Retrieved from <https://gis.chinhphu.vn>.
- Yildirim, Ç. (2023). Measuring network efficiency of the aquaculture value chain in Turkey. *Aquaculture*, 576(2023), 739896. <https://doi.org/10.1016/j.aquaculture.2023.739896>.