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APPLICATION OF THE LOGISTICS CHAIN APPROACH IN ANALYZING THE VALUE CHAIN OF SHALLOTS: THE CASE OF TRA VINH PROVINCE, VIETNAM

Nguyen Thi Thuy Loan[1*], Diep Thanh Tung[2], Nguyen Thi Ngan Ha[3], Duong Kim Hau[4]

Abstract – *In recent years, increased market demand has led many regions to promote shallot cultivation. The development of the shallot value chain in the Mekong Delta has been faced with high logistics costs, which hinder the competitiveness of its agricultural supply chains. This study analyzes the shallot value chain in Tra Vinh Province, focusing on logistics costs for actors like farmers, collectors, wholesalers, and retailers. Using qualitative and quantitative methods, the research identifies key logistics expenses, primarily transportation, followed by classification and packaging. According to the research findings, the shallot value chain in Tra Vinh Province is primarily domestic. Specifically, the primary market channels are farmers – collectors – wholesalers – retailers – consumers. Shallots are profitable for farmers, generating an average profit of 9.53 thousand VND/kg, a 1.64 profit margin. However, production has declined due to unfavorable weather and payment risks, causing farmers to reduce cultivation and switch to other crops. Regarding logistics costs, logistics functions and costs for each activity vary substantially among participants. Farmers perform the most logistics responsibilities along the value chain; therefore, their total costs are the greatest, with incoming logistics expenses accounting for the largest amount. Collectors have the fewest logistics functions and simply incur operational costs.*

Keywords: logistics chain approach, shallots, value chain analysis.

[1,2,3,4]Tra Vinh University, Vietnam

*Corresponding author: nttloan@tvu.edu.vn

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I. INTRODUCTION

Vietnam's tropical climate supports a thriving agricultural sector, positioning the country as one of the region's leading agricultural exporters. As of the first eight months of 2023, agricultural export turnover reached $16.9 billion, an 11.5% increase from 2022. Notably, spice exports, including onions, chives, and garlic, reached over $1 billion, a 7% increase [1]. In 2022, export turnover for onions, chives, and garlic alone reached $31.2 million, a remarkable 360% growth from 2021. The main markets for these products are in Asia, with China accounting for over 55% of exports, followed by the U.S., Europe, and Australia [2]. It can be seen that the consumption market for spice products such as onions in Vietnam is increasing and expanding across continents. In response to rising market demand, many regions in Vietnam have expanded shallot cultivation. Nationwide, the total production area is around 14,000 to 15,000 hectares, mainly in Soc Trang, Hai Duong, Ninh Thuan, and Quang Ngai. Soc Trang alone produces 90,000 tons from 6,500 hectares [3]. In Tra Vinh Province, coastal farmers have expanded shallot cultivation on sandy land for higher economic returns. In Duyen Hai Town, over 550 hectares were planted in 2022, with more than 200 hectares in Truong Long Hoa and Dan Thanh Communes converted from low-yield crops, boosting income five to seven times [4].

Despite recent growth in shallot production and exports, farmers and businesses face significant challenges. Poor crop season planning leads to oversupply during the main season, causing prices to drop. Farmers often work individually without strong links to cooperatives

or businesses, and the lack of storage and post-harvest technology results in shallots being easily damaged, especially in Southern provinces. The growing area in the South is about 7,000 hectares, with a large harvest from December to March, further contributing to price declines [3]. In addition, shallot storage time cannot be extended because of a lack of storage and post-harvest technology, so the domestic market has not been optimally utilized.

The development of the shallot value chain in the Mekong Delta faces significant logistics challenges, with the region experiencing the highest logistics costs in Vietnam, accounting for up to 30% of product costs. This reduces the competitiveness of agricultural supply chains. The region has only 1,461 logistics businesses, a small fraction compared to Hanoi (5,052) and Ho Chi Minh City (10,778) [5]. Due to the nature of agricultural products, quick transportation and proper storage are essential, but the Delta lacks sufficient cold storage and processing facilities. Most agricultural products are sent to Ho Chi Minh City or Dong Nai Province for processing [5]. Additionally, supporting industries for agricultural processing in the region are underdeveloped. In Tra Vinh Province, shallot farmers face high production costs due to the heavy use of fertilizers and pesticides, along with challenges from pests, drought, and saline intrusion [6].

For that reason, in order to develop and perfect the supply chain of agricultural and aquatic products in the Mekong Delta, related logistics management activities such as reducing logistics costs for agricultural and aquatic products and meeting timely requirements must first be developed and perfected. Transportation and warehousing requirements are the top requirements today. Therefore, this study aims to analyze the shallot value chain in Tra Vinh Province according to the logistics chain approach to determine logistics costs for each actor in the chain as well as find the causes and limitations. Mechanism in upgrading the value chain.

II. LITERATURE REVIEW

A. Value chain and value chain analysis

The subject of the value chain of agricultural products has been extensively examined, with particular emphasis on the rice value chain [5–7], the chili value chain [8], the mango value chain [9], and others. Vo Thi Thanh Loc et al. [10] conducted an analysis of the shallot value chain in Soc Trang Province. It was discovered that Vinh Chau's shallots have a competitive advantage due to climate and soil conditions. The chain has four stakeholders spread across four market channels, two of which are for export, resulting in the largest added value. Farmers also profit more from shorter channels. In a separate study, Quan Minh Nhut et al. [11] employed data envelopment analysis on 70 shallot-growing households to assess production efficiency, demonstrating great technical efficiency but poorer cost-efficiency due to resource misallocation. In 2018, Bui Van Trinh et al. [12] conducted research on the shallot value chain in Duyen Hai District of Tra Vinh Province. Although local conditions are favorable for shallot cultivation, producers encounter challenges such as pest infestations and saltwater intrusion. The chain has two domestic channels that involve farmers, collectors, wholesalers, and retailers. Farmers make the most money, with lower returns for each subsequent shareholder. These studies are largely concerned with value chain analysis and the economic efficiency of agricultural products. Methods from Kaplinsky et al. [13], GTZ ValueLinks [14], and M4P [15] were applied, covering revenue, cost-benefit, and added value analysis. However, the logistics costs, or the scheduling, storage, and handling components of the supply chain, have not been examined in the context of Mekong Delta. Logistics expenses, particularly in the Mekong Delta, can account for up to 30% of total product pricing, lowering agricultural supply chain competitiveness [16]. This study expands on earlier findings by investigating logistics along the fresh shallot value chain in Tra Vinh Province.

The value chain concept, introduced by Porter [17], encompasses all activities needed to bring

a product from conception to disposal, including production, distribution, and final use. Kaplinsky et al. [13] broaden this to cover the entire sequence of activities involved in creating and delivering a product or service. This includes both direct functions like production, retail, and support functions such as supply, financial services, transportation, packaging, and advertising.

The goal of value chain analysis is to increase production efficiency so that the company can provide the most value at the lowest possible cost [18]. Based on related concepts, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) [14] has proposed the value chain link approach 'ValueLinks' and created appropriate value chain maps for agricultural products as shown in Figure 1. This diagram identifies business activities (chain functions), the order of chain operators (chain actors), their linkages (chain market channels), and value chain supporters.

GTZ's value chain diagram identifies five main actors in agricultural product chains, with each actor's consumption stage serving as the next actor's input. Improving value or cost efficiency at each stage enhances the entire chain [14]. This study will analyze the effectiveness of each actor using a logistics approach.

B. Logistics chain analysis

In value chains, each activity has a unique cost structure influenced by various cost drivers. Kantabutra et al. [19] highlight that logistics analysis is crucial for enhancing customer service, competitive pricing, quality, and flexibility. Cost analysis involves segmenting the value chain to assess each activity's impact on total costs, identifying key cost drivers, and determining which activities should be performed or outsourced [20]. Effective logistics cost analysis reveals the major cost components and how they affect other activities, making it essential for logistics chain analysis [21].

Logistics cost analysis varies by product value chain and focuses on cost-effectiveness among chain actors. Using Porter's value chain model, each actor is viewed as an enterprise. Porter [17] classifies activities into primary and support categories, with the value chain influenced by suppliers and customers. The quality of raw materials, for instance, affects the entire value system and final product. A company's activities are identified by Porter [17] as consisting of two groups of activities: i) main activities and ii) support activities, as shown in Figure 2.

III. RESEARCH METHODS

The study combines secondary and primary data. Secondary data includes statistics on shallot production in Tra Vinh and related reports. Primary data is gathered through interviews with various value chain actors, including farmers, collectors, wholesalers, retailers, and consumers. The survey questionnaires will be specifically designed for each participant in the chain. The study surveyed 71 participants: 51 farmers, 3 collectors, 2 wholesalers/processors, 2 retailers, 3 experts, and 20 consumers. Based on the list of shallot producers provided by the locality, shallot farming households were randomly interviewed in Tra Vinh Province's two main shallot-growing areas, Truong Long Hoa Commune, Duyen Hai Town and Dong Hai Commune, Duyen Hai District.

Collectors, wholesalers, and retailers were chosen based on contact information provided by agents from the previous stages in the value chain.

For analysis, both qualitative and quantitative methods are used. Qualitative analysis maps out value chain actors and relationships through desk research and key informant interviews, while quantitative analysis applies cost-benefit methods to estimate logistics costs and times for each actor in the chain.

IV. RESULTS AND DISCUSSION

A. The shallot value chain map of Tra Vinh Province

The value chain of shallots in Tra Vinh Province is built based on secondary data collected from previous studies and in-depth interviews with participants involved in the chain.

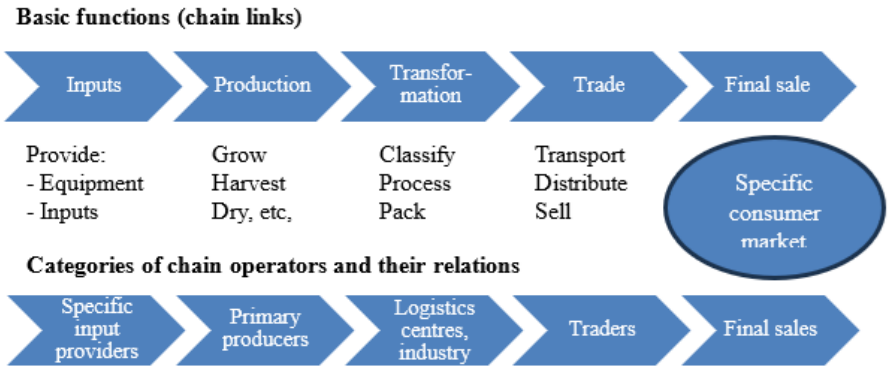

Fig. 1: Value chain diagram [14]

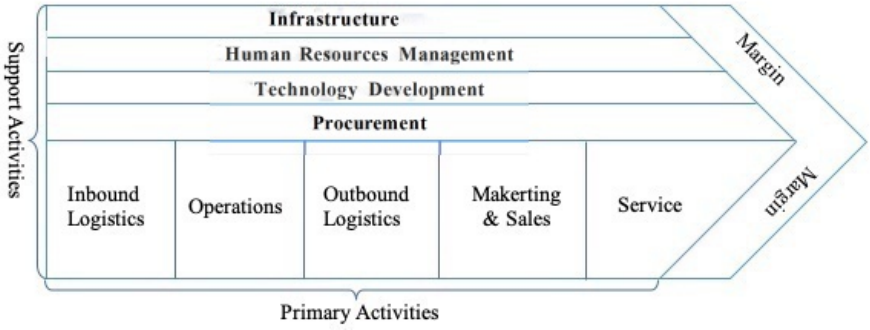

Fig. 2: Model of primary and support activities in the value chain [17]

The shallot value chain, from the production stage, includes four main functions: production (farmers, cooperatives), collection (collectors), trade (wholesalers, retailers), and consumption.

The shallot value chain includes the following three main marketing channels: i) farmers – collectors – wholesalers (in Soc Trang Province and Ho Chi Minh City) – exporters; ii) farmers – collectors – wholesalers (in Soc Trang Province and Ho Chi Minh City) – retailers – domestic consumers; and iii) farmers – local markets – domestic consumers. Among these, the marketing channel that accounts for the largest share of production output for farmers in Tra Vinh Province is Channel 2 (farmers – collectors – wholesalers – retailers – domestic consumers).

Marketing Channel 1: This is the only export market channel of the value chain. According to the Ministry of Agriculture and Rural Development of Vietnam [16], Vietnam's export turnover for onions, chives, and garlic reached $31.2 million in 2022, a nearly 360% increase from 2021. Over 90% of exports went to Asian markets, followed by the Americas, Europe, and Australia. China was the largest importer, with $17.26 million in turnover (excluding Taiwan's $6.6 million). However, in early 2023, market demand declined despite stable production. In just the first two months, onion exports reached only 240 tons, a small fraction of the annual 200,000-ton output [14]. Only a small proportion of shallots produced in Tra Vinh Province are exported. The main export output currently comes from provinces such as Soc Trang, Hai Duong, Ninh Thuan, etc. The standards for exporting onions to other countries are very high, especially

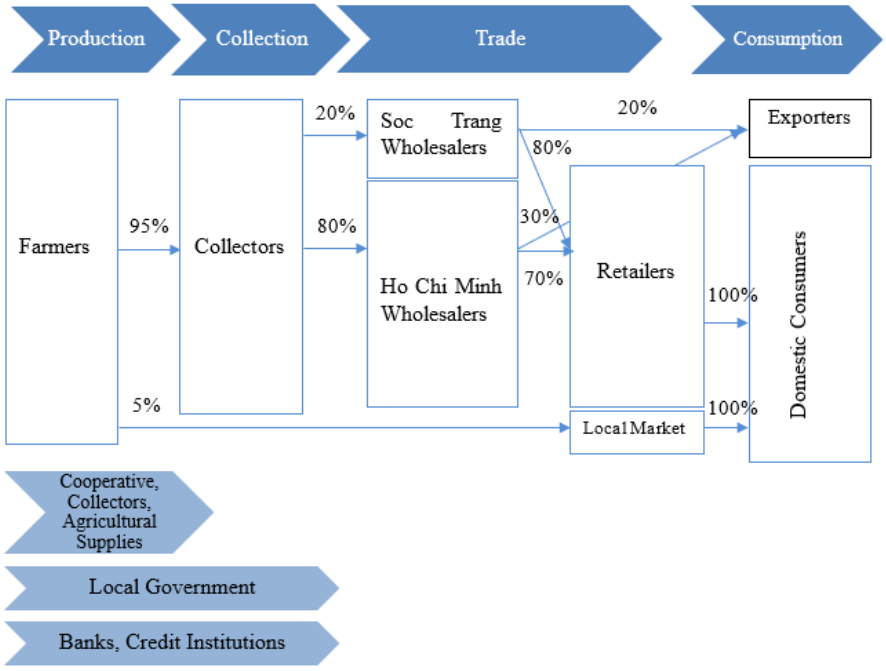

Fig. 3: Map of the shallot value chain of Tra Vinh Province

Source: Calculation of the Authors, 2024

in demanding markets such as the United States or Japan. These markets all require certificates of production standards such as Global Gap or Good manufacturing practice (GMP). Therefore, in terms of output and quality, shallots in Tra Vinh Province currently do not meet the export conditions, so they are mainly consumed domestically.

Marketing Channel 2: This is the main marketing channel of the value chain, accounting for the largest share of shallot consumption. After harvest, more than 95% of the onions are sold to local collectors or a few collectors from Soc Trang Province. The collectors then transport about 80% of the onions to wholesalers in Ho Chi Minh City and about 20% to wholesalers in Soc Trang Province. Subsequently, around 70%–80% of the onions are supplied by these wholesalers to retailers (supermarkets, stores, small vendors, etc.) for sale to domestic consumers.

Marketing Channel 3: This marketing channel is quite small. After being sorted, onions that do not meet the quality standards of collectors (about 5% of the harvest) are sold by farmers to small vendors at local markets or to local eateries.

B. Value chain analysis

There are basically three marketing channels, as shown in Figure 3. Since marketing Channels 1 and 3 account for an insignificant proportion of output, the analysis focuses mainly on market Channel 2 (farmers – collectors – wholesalers – retailers – domestic consumers). The main actors in the chain are found to be farmers, collectors, wholesalers, retailers, and consumers. How the actors in the chain relate to each other is illustrated in Figure 4.

Farmers

Fifty-one farmers who have been interviewed in Duyen Hai Town and Duyen Hai District are assumed to be representative of the whole Tra Vinh Province. Each interview has been thorough, and it was decided that since the landscape, the weather conditions, and the overall economy

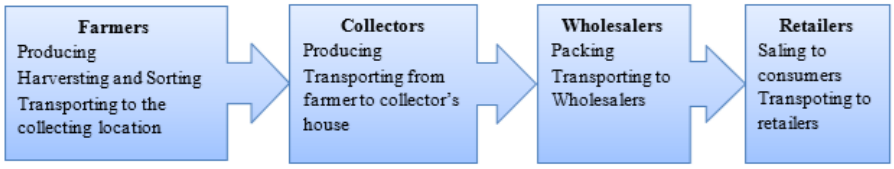

Fig. 4: An illustration of the different stages of the shallot value chain

Source: Calculation of the Authors, 2024

are reasonably the same for all farmers. The results from the questionnaires with the farmers will be presented in Table 1. The average size of the shallots fields is 5.51 (1,000 m^2). The average yield per 1,000 m^2 is 994.96 kg. This yield is calculated based on the standard shallots yield purchased by collectors. The loss is estimated by farmers based on the yield of substandard shallots and the yield lost due to weather and pests. Specifically, the average loss per 1,000 m^2 is about 21.71 kg.

Table 1: Land size, yield, and the losses of shallot

Variable	Unit	Mean	Standard Deviation	Min	Max
Size of land	1,000 m^2	5.51	4.12	1.5	20
Yield	kg/1,000 m^2	994.96	535.86	225	2000
Losses	kg/1,000 m^2	21.71	13.24	5	80

Costs at the farms have been investigated to get a total production cost per kg of shallots. The main inputs for growing shallots are seeds, pesticides, and fertilizers. Inbound logistics costs make up the largest portion of farmers' total production costs (over 66%), with an average cost of 8.89 thousand VND/kg of produced shallots. In Tra Vinh Province, all shallot seeds come from Vinh Chau District, Soc Trang Province, supplied by local collectors or those from Soc Trang Province. Seed costs account for about 41% of total costs, averaging 5.45 thousand VND/kg of harvested shallots. This reliance on external seed sources is one of the challenges in shallot farming in the province. Pesticides and fertilizers are also heavily used because shallots are susceptible to pests, especially in unfavorable weather. As a result, most farmers have reduced their planting to one crop per year, grown from September to December. Pesticides and fertilizers are bought from local agricultural stores, so transportation costs to the farm are minimal.

Table 2: Cost for each activity of farmers, presented in thousand VND/kg shallots

Activity	Mean	Standard Deviation	Min	Max
Inbound logistics	8.89	7.91	0.57	42.78
Seeds	*5.45*	*5.29*	*0.24*	*26.67*
Fertilizer, pesticide	*3.45*	*4.09*	*0.16*	*27.78*
Operations (farming)	4.21	3.50	0.52	16.11
Fuel costs (oil, electricity, water, etc.)	*0.73*	*0.65*	*0.07*	*3.47*
Machine depreciation costs	*0.64*	*0.98*	*0.00*	*4.60*
Labor costs (planting, tending, watering, harvesting)	*2.85*	*2.66*	*0.24*	*15.10*
Outbound logistics (*Transportation costs to the collection location)*	0.24	0.25	0.00	1.00
Sales (*communication, selling costs, etc.)*	0.03	0.09	0.00	0.52

The operations are farming activities including plowing, sowing, fertilization, irrigation, disease protection, weed picking, and harvest. The costs have been put into the different farming activities, including machine depreciation, fuel, and labor costs. Also, the machine depreciation costs have been taken into account. The total operation cost is 4.21 thousand VND/kg of produced shallots.

Planting, tending, watering, and harvesting all incur labor expenditures. The farmer often employs one or two full-time workers to handle the more routine tasks and hires temporary workers to handle other tasks. Farmers typically have one or two permanent workers, who are themselves and family members, to conduct the routine tasks. They exclusively engage temporary workers to provide additional support, and they normally pay 200–250 thousand VND for one day of labor. Most of the laborers are women who can help with harvesting or weeding. Farmers conduct more regular work such as irrigation, fertilization,

and disease protection (see Figure 5). Temporary workers can be paid per day or for the work they complete. A group of workers can also be employed to do a specific operation. For example, the rental fee for shallot harvesting, which includes harvesting, sorting, and cleaning, is 1 million VND per 1,000 m^2. Following harvest, the shallots will be processed, cleaned, and packed into bunches to dry on the farm for 2–3 days before being sold to collectors. Figure 5 depicts female workers gathering shallots.

Outbound logistics is transportation costs from the farm to the collection location. Shallots are purchased and transported out of the farm 2–3 days after harvest. Most farmers' farms are 2–3 km from the main road (purchase location). Farmers are responsible for hiring a vehicle to transport them, as the road is small, so they only hire motorbikes. The cost of hiring a transport is usually 250,000–270,000 VND/1,000 kg. For farms near the main road, there will be no additional transport costs because collectors will come directly to buy.

Fig. 5: Female workers gathering shallots

Source: Photo taken by the Authors, 2024

When a farmer has a product to sell, a collector is contacted to locate purchasers. The collector visits the farm to do a quality check and offers the farmer a price. Some farmers contact other farmers or collectors to obtain a sense of the price range to negotiate. The cost for this activity would be the working time spent on finding and negotiating with a broker and also the phone costs to be able to have contact with collectors. This cost is estimated at an average of 30 VND/kg. When they reach an agreement, the collector will deposit around 2–3 million/1,000 m^2, depending on the quality of the shallots. Collectors will pay the remaining amount after reselling to wholesalers, which typically takes approximately 4–5 days from the time of purchase from farmers. All transactions between farmers and collectors take place without the use of any documentation. As a result, farmers frequently face the possibility of collectors canceling deposits and not purchasing at a low market price or collectors failing to pay the remaining balance after purchasing. Typically, in the shallot crop at the end of 2023, several farmers in this area were not paid by collectors in other areas after purchasing, resulting in a significant reduction in shallot production area in 2024 as farmers moved to different crops.

Table 3: The costs, revenues, profits, and margins estimated average of farmers

Activity	Units	Mean	Standard Deviation	Min	Max
Production cost	thousand VND/kg	13.38	10.44	1.81	58.89
Selling price	thousand VND/kg	22.90	4.42	14.00	30
Profit	thousand VND/kg	9.53	11.77	–33.89	23.19
Profit margin		**1.64**	**2.17**	**–0.58**	**12.84**

The activities excluded from Porter's value chain model [7] are marketing and service because they are done by the collector together with the wholesaler. The costs, revenues, profits, and margins estimated average of farmers can be seen in Table 3. The results show that the average total cost of shallot production is 13.38 thousand VND/kg of shallot produced. The selling price purchased by collectors fluctuated between 20 and 28 thousand VND/kg in the last crop. The average profit of farmers is 9.53 thousand VND/kg of shallot produced. Accordingly, the average profit margin of farmers is quite high, at about 1.64. However, the standard deviation and the range of profit margin are also quite large. The lowest value is –0.58, which means

that farmers have a capital deficit.

Collectors

No physical flow of shallots takes place in this step of the value chain. The collectors only work as a connection between wholesalers and farmers. The wholesaler is the one paying for the collectors' services. Since no physical flow takes place, there are no inbound or outbound logistic activities in this step. The operations activity is to connect farmers and wholesalers so that a transaction can be made between these two actors. When harvest time arrives, collectors will give farmers bags to hold and weigh the shallots before loading them onto trucks. The collectors oversee the harvest to ensure that the shallots are of high quality before transporting them to wholesalers. Wholesalers said they pay collectors between 450,000 and 500,000 VND for every 1,000 kg of shallots. Collectors' costs include visits to fields to inspect the quality, harvest monitoring, phone calls, packaging, labor (loading, peeling), and shipping. Table 4 shows all of the costs incurred by the collectors interviewed.

Table 4: The costs, revenues, profits, and margins estimated average of collectors

Activity	Units	Mean
Transportation cost (*from farm to collector's house)*	thousand VND/kg	0.10
Packaging	thousand VND/kg	0.08
Labor cost (loading, peeling)	thousand VND/kg	1.50
Telephone	thousand VND/kg	0.05
Total cost	thousand VND/kg	**1.73**
Income	thousand VND/kg	**3.73**
Profit	thousand VND/kg	**2.00**
Profit margin	-	**1.16**

Wholesales

The majority of the shallot wholesalers in the network are from Ho Chi Minh City and Soc Trang Province. Most wholesalers also operate as collectors, acquiring products from collectors and reselling them to smaller wholesalers in other regions. In this instance, they suffer only from warehouses and sales costs. Income is calculated as the difference between the selling and purchasing prices. The wholesalers' costs and earnings are reflected in Table 5. A small number of wholesalers are cooperative and trading enterprises. After purchasing shallots from collectors, they classify, clean, package, label, and redistribute to supermarket systems/retailers or export. However, these products all have clear origins, specifically Vinh Chau shallots, so the quantity of shallots supplied by Tra Vinh Province to this market channel is insignificant and is not considered for analysis in this case.

The shallot value chain analysis shows that inbound logistics costs are relatively low, with transportation from collectors to wholesalers at 0.45 thousand VND/kg and labor costs for loading and unloading at 0.25 thousand VND/kg, totaling 0.70 thousand VND/kg. Operational costs are higher, dominated by warehouse or rental costs at 1.00 thousand VND/kg, along with labor costs for selling (0.30 thousand VND/kg) and telephone expenses (0.06 thousand VND/kg), bringing total operational costs to 1.36 thousand VND/kg. Despite these costs, the value chain is highly profitable. With an income at 4.26 thousand VND/kg and profit at 2.20 thousand VND/kg, the profit margin of 1.07 indicates strong returns, demonstrating the financial viability of shallot trading in this context.

Table 5: The costs, revenues, profits, and margins estimated average of wholesalers

Activity	Units	Mean
Inbound Logistics	thousand VND/kg	0.70
Transportation cost from collector's house to wholesalers	*thousand VND/kg*	*0.45*
Labor cost (loading, unloading)	*thousand VND/kg*	*0.25*
Operations	thousand VND/kg	1.36
Warehouse costs or rental costs	*thousand VND/kg*	*1.00*
Labor cost (selling)	*thousand VND/kg*	*0.30*
Telephone	*thousand VND/kg*	*0.06*
Total cost	thousand VND/kg	**2.06**
Income	thousand VND/kg	**4.26**
Profit	thousand VND/kg	**2.20**
Profit margin	-	**1.07**

Retailers

Retailers in the shallot value chain are divided into two categories: small market vendors and convenience stores/supermarkets. They all purchase shallots from wholesalers in Ho Chi Minh City or Soc Trang Province. Estimating transportation costs in addition to other expenditures is challenging for the convenience store/supermarket system since these units frequently use their own shipping partners to deliver a wide variety

of agricultural products to the branch stores and supermarkets within the system.

Table 6: The costs, revenues, profits, and margins estimated average of retailers

Activity	Units	Mean
Inbound Logistics	thousand VND/kg	0.75
Transportation costs from wholesalers to retailers	thousand VND/kg	*0.50*
Labor cost (loading, unloading)	thousand VND/kg	*0.25*
Operations	thousand VND/kg	1.12
Warehouse costs or rental costs	thousand VND/kg	*0.60*
Labor cost (selling)	thousand VND/kg	*0.40*
Telephone	thousand VND/kg	*0.02*
Shallot losses (loss of weight, damage, inventory,..)	thousand VND/kg	*0.10*
Total cost	thousand VND/kg	**1.87**
Income	thousand VND/kg	**4.67**
Profit	thousand VND/kg	**2.8**
Profit margin	-	**1.50**

Shallot products are marketed in two varieties. Specifically, the products have labels, and names, and are classified with defined weight levels (300 grams, 500 grams, or 1,000 grams), with the selling price of Vinh Chau shallots type 1 at supermarkets ranging from 100 to 120 thousand VND per kilogram. These items typically have a distinct provenance and a brand or geographical indication (GI) certification, such as Vinh Chau shallot, Ly Son shallot, Hai Duong shallot, and so on. Because Tra Vinh shallot does not yet meet the standards, it is sold as regular items (without labeling or pre-weight classification) in markets and convenience stores/supermarkets, with prices ranging from 35–40 thousand VND/kg. As a result, cost and profit indicators for retailers are evaluated primarily based on the target group of small collectors in markets for typical shallot items.

The shallot value chain reveals that inbound logistics, which includes transportation (0.50 thousand VND/kg) and labor (0.25 thousand VND/kg), totals 0.75 thousand VND/kg (see Table 6). Operational costs are greater, reaching 1.12 thousand VND/kg, with warehousing fees (0.60 thousand VND/kg) and selling labor (0.40 thousand VND/kg) accounting for the majority of the cost. Minor costs such as telephone (0.02 thousand VND/kg) and inventory or damage losses (0.10 thousand VND/kg) are also considered. Despite these costs, the trade is extremely profitable, with a profit of 2.8 thousand VND/kg and an income of 4.67 thousand VND/kg. Despite operational problems, shallot trading is financially beneficial, as seen by the profit margin of 1.50, which indicates good returns.

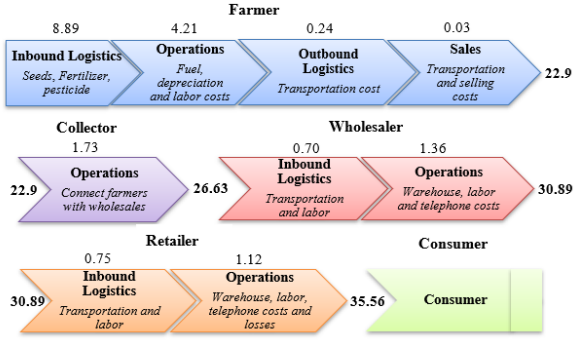

Fig. 6: The complete value chain from farmer to consumer for shallots in Tra Vinh

Source: Author's synthesis, 2024

As seen in Figure 6, there are six actors throughout the entire supply chain, from farmers to customers. According to Porter [17], the logistical functions are nearly complete at the production stage, with the exception of the final function, services. Farmers have the largest profit margins in the shallot value chain, but they are also the most vulnerable and at risk. Farmers spend far more money and time than other actors. Although the wholesaler's profit margin is slightly smaller than that of collectors and retailers, with a significant volume of shallots sold per day, the overall profit earned will be proportionately considerable.

V. CONCLUSION AND RECOMMENDATIONS

Shallot is one of the crops in Tra Vinh Province that has a strong economic importance for people, as do other crops. However, in recent years, shallot production in the province has resulted in tiny gardens in terms of size and output. The study was designed to thoroughly examine each actor in the shallot value chain using a

logistics methodology. The analytical data was compiled through direct interviews with chain participants such as farmers, collectors, wholesalers, retailers, and consumers. According to the study's findings, the shallot value chain in Tra Vinh Province is consumed via three marketing channels, with farmers – collectors – wholesalers (in Soc Trang and Ho Chi Minh) – retailers – domestic consumers accounting for more than 90% of output. Because the province's shallot products do not meet origin and quality requirements, access to export markets or high-grade items with full labeling in retail systems remains limited. In terms of logistics costs, logistics functions and costs for each activity vary substantially among participants. Farmers perform the most logistics duties along the value chain; therefore, their total cost is the greatest, with incoming logistics expenses accounting for the largest amount due to dependence on local seed sources and high prices. Farmers also have the biggest profit margins, as well as the highest costs and risks when compared to other actors. Collectors are the actors with the fewest logistics functions, only operating costs. They operate as middlemen between farmers and wholesalers. However, collectors play a significant part in Tra Vinh Province's shallot value chain because items cannot be delivered directly from farmers to wholesalers due to low production output and quality. Wholesalers and retailers perform similar logistics activities and functions. However, retailers incur additional costs for goods loss due to weight loss, damage, or inventory.

In short, the shallot value chain confronts several issues, including dependency on external seeds, goods with no brand or origin, informal farmer-collector relationships, climate risks, price swings, and a shortage of cold storage, which leads to supply imbalances. Several solutions have been offered to improve the value of the chain.

- Local seed production: Creating local seed sources and cooperatives to lessen reliance on external suppliers and save money.

- Formalize farmer-collector cooperation: Using contract farming and cooperatives to ensure consistent prices and lower risks for farmers.

- Climate resilience: Encouraging sustainable farming methods, providing weather forecasting tools, and implementing crop insurance to reduce losses caused by climate change.

- Branding and certification: Obtaining geographical indication (GI) certification and developing a brand identity for shallots to enter premium markets.

- Cold storage and supply chain: Investing in cold storage and logistics to balance supply and demand, avoiding both shortages and oversupply, resulting in more stable prices.

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