

VALUE CHAIN ANALYSIS OF WHITE LEG SHRIMP INDUSTRY IN CAN GIO DISTRICT, HO CHI MINH CITY

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Received: 21 January 2018; Accepted: 3 April 2018

ABSTRACT

*This article describes the factors of value chain analysis and clarifies the distribution of profits among the factors involved in the value chain of White Leg shrimp (*Litopenaeus vannamei*) in Can Gio District, Ho Chi Minh City. The study was carried out from July to December 2017 through primary data collection with 204 samples including factors involved in the chain in four of the communes of the district, An Thoi Dong, Ly Nhon, Tam Thon Hiep and Binh Khanh. Among factors in the chain, the distributions of value added and income are different; the majority of value added are contributed mainly from farmer households (81.3%); a substantial part of profit in the chain belongs to processing enterprises (70.7%).*

Keywords: value chain, net value added (NVA), White Leg shrimp, Can Gio

TÓM TẮT

Phân tích chuỗi giá trị ngành hàng tôm thẻ chân trắng ở huyện Cần Giờ, Thành phố Hồ Chí Minh

Bài viết này mô tả các tác nhân, phân tích chuỗi giá trị và làm rõ việc phân phối lợi ích giữa các tác nhân tham gia vào chuỗi giá trị tôm thẻ chân trắng ở huyện Cần Giờ, Thành phố Hồ Chí Minh. Nghiên cứu được thực hiện từ tháng 7 - 12/2017 thông qua thu thập số liệu sơ cấp với 204 mẫu bao gồm các tác nhân tham gia vào chuỗi trên địa bàn 04 xã của huyện là An Thới Đông, Lý Nhơn, Tam Thôn Hiệp và Bình Khánh. Sự phân phối giá trị gia tăng và thu nhập giữa các tác nhân trong chuỗi là không đồng đều, phần lớn giá trị gia tăng và lợi nhuận toàn chuỗi tập trung về phía người nuôi (81,3%). Khi tính trên tổng lợi nhuận trong năm của chuỗi mà một tác nhân được nhận thì lợi nhuận tập trung hầu hết cho các doanh nghiệp chế biến (70,7%)

Từ khóa: chuỗi giá trị, giá trị gia tăng thuần, tôm thẻ chân trắng, Cần Giờ

1. Introduction

Can Gio is a coastal district located to the Southeast of Ho Chi Minh City, about 50 km from the center. Can Gio District includes Can Thanh Township and six communes, Binh Khanh, An Thoi Dong, Ly Nhon, Tam Thon Hiep, Long Hoa and Thanh An. The natural land area of the district is 704.2 km². The terrain is divided by rivers, canals and mangroves, and forest land accounts for 47.25% of the land area. Mangrove forests are interwoven with dense river systems, and contain high biodiversity ecosystems. According to the People's Committee of Can Gio District, at the end of 2017, the district has 2,660 hectares of shrimp farming, yielding 6,730 tonnes. The total production

value of agricultural, forestry and fishery industries in 2017 reached 1,971 billion VND, 0.76% from farming at 15 billion VND, 1.78% from fishery breeding at 35 billion VND, and 97.46% from fisheries at 1,921 billion VND. Clearly, Can Gio is a key district for fisheries production by saltwater and brackish water (People's Committee of Can Gio District, 2018).

Examining the region's production of brackish shrimp farming, particularly White Leg shrimp, reveals that production does not fulfill the available potential, and the industry has been developed with a weak sustainability. It has primarily been developed with more regard to width, and with little focus on developing in depth to increase the value of production per

unit of area. Deeper development of White Leg shrimp farming is limited by weakly controlled disease, lack of sufficient investment capital, and technical barriers to competing with the trade of the import market. The structure of product processing has not been developed by principle, and remains largely limited to low-level preliminary processing, resulting in low Value Added (VA) products. The products are low in quality and do not compete well in the market; the selling price is often 5% to 10% lower than similar products from competing countries in the region; and the cost of shrimp farming in the area is 10% to 15% higher (VASEP, 2018).

The primary cause of this unprofitable market is the small scale of production by households, yielding high production costs, and preventing formation of business links with enterprises. The area's shrimp farming industry lacks a long-term orientation, even in the domestic market where the industry has failed to develop prestigious brands. Short-term vision and fragmented production facilities have weakened the otherwise strong product, an etnam's shrimp production is gradually losing its position in the international market.

Beyond initial production, trading White Leg shrimp is a source of income for many dealers and retailers, but they have not developed their knowledge and practice of food hygiene, product safety and preservation of quality, resulting in the low quality of White Leg shrimp.

Shrimp processing enterprises compete fiercely for their raw materials, and face difficulties and challenges blocking better integration and growth. The challenges hinder their efforts to meet the rising expectations of consumers, and this contributes to the reduction of production stability.

From the facts cited this far, a thorough analysis of the White Leg shrimp industry's Value Chain in Can Gio District, Ho Chi Minh City is necessary.

Research objectives include the following items: (1) Description of the value chain of white leg shrimp in Can Gio, Ho Chi Minh

City, (2) Analysis and evaluation of economic efficiency between factors in the chain, (3) Analysis of input factors affecting the productivity and economic efficiency of investments in shrimp farming and (4) Suggestion of solutions to upgrade this sector's value chain.

2. Research Methods

The method of stratified random sampling is used to collect primary data. The research was conducted in An Thoi Dong, Ly Nhon, Tam Thon Hiep and Binh Khanh, the four communes with the largest area and output in Can Gio District selected as research representatives. There was a total of 204 households/establishments included in the direct survey consisting of 7 breeding farms (04 production farms and 03 taming farms), 11 aquatic feed and veterinary medicine suppliers, 164 households with commercial shrimp farming, 9 traders purchasing raw shrimp, 4 major purchase dealers of raw shrimps, 03 shrimp processing plants and supporting agencies (04 managers from the industry and associations and 02 staff from the institute/ university) based on the prepared questionnaire which is adjusted after the interviews.

Secondary data was collected from the annual reports from units related to fisheries on the research area. The theory of value chain by Kaplinsky and Morris (2001) and the value chain approach of GTZ (2007) were used in the research and analysis of the collected data along with representatives of all the participating factors of the chain. Descriptive statistics was used to describe the targets of research and comparisons between groups of factors, besides the application of economic chain analysis method in as well as Cobb-Douglas production function was used analyze to productivity of white leg shrimp in the relationship with input factors were also used in the research.

Calculating the benefit - cost criterion of each factor in the chain:

VA: for farmers is the increased value of a production and business process. With other factors in the chain, Add Value is the increased value when the product goes through the factor,

calculated by deduction cost of inputs from the selling price.

NVA (or profit): is calculated by deduction cost increase from VA of each factor in the chain.

Cost increase for farmers is calculated in the total costs. For other factors in the chain, cost increase includes shipping costs, labor cost or preservation cost.

Total profit of a factor in the year is the product of NVA and average purchase shrimp output during the year

* *Cobb-Douglas production function:*

$$Y = A \cdot \prod_{i=1}^n X_i^{\alpha_i} \cdot e^{\sum_{j=1}^m \beta_j D_j} \quad (1)$$

In which: Y is output amount ($Y \geq 0$); A is a constant, a parameter representing efficiency; X_i ($i = 1-n$) ≥ 0 : input amount i; n is number of outputs, determining quantities of various

inputs; α_i ($i=1-n$, $0 < \alpha_i < 1$) is the coefficient of impact of independent variables X_i to Y; D_j ($j=1-m$) ≥ 0 is dummy variable j; β_j ($j=1-m$, $0 < \beta_j < 1$) is the coefficient of impact of dummy variable D_j . From the Cobb-Douglas production function (1), we can take the logarithm of two sides:

$$\ln Y = \ln A + \sum_{i=1}^n \alpha_i \ln X_i + \sum_{j=1}^m \beta_j D_j \quad (2)$$

Equation (2) can be calculated in the form of a linear function $Y = \beta_0 + \beta_1 X_1 + u_i$ estimated by the least squares method.

3. Results and Discussion

3.1. Describe the factors involved in the value chain of White Leg shrimp in Can Gio District

Table 1. Brief description of participants in the value chain of White Leg shrimp in Can Gio District

No.	Factor	Function	Role	Operation method
1	Breed supplier	Produce and supply Shrimp seed	Supply breed according to the demands of local White Leg shrimp farmers	Purchasing breed in the central provinces and local breed production and taming farms sell breed to farmers based on 100% prepayment.
2	Aquatic feed suppliers and aquatic veterinary drug suppliers	Produce and supply various materials for shrimp farming	Provide feed, drug and environment treatment chemicals.	Product distribution for feed processing establishments for farmers through intermediary distribution channels. Each processing establishment has a system of level 1 and level 2 dealers providing products to farmers. Contracting for sale of products on behalf of the company, dealers earn profits by sale price disparity and commission (7.6 - 8.8% for aquatic feed suppliers and 25.2 - 29.6% for aquatic veterinary medicine suppliers). They sell to farmers and complete the payment at the end of each shrimp crop.

3	Shrimp farmers	Carry on commercial farming of White Leg shrimp, and provide to domestic and foreign markets	Providing raw material for shrimp traders and major-purchase dealers.	Intensive and semi-intensive farming accounted for over 50% of the total area of White Leg shrimp farming in Can Gio District. Prior to sale, farmers ask about reference prices with other farmers, then contact traders and major-purchase dealers, who come to the shrimp farming ponds to negotiate the price by checking shrimp samples from ponds for quantity and size, and then determining the purchase price.
4	Traders and major-purchase dealers	Purchase raw shrimp	Purchasing raw shrimp from farmers and selling to domestic consumers and processing enterprises.	Traders buy shrimp directly from local shrimp farmers and cooperatives, while major-purchase dealers buy shrimp either from traders (78%) or directly from farmers (22%). After completing purchases, in the case of small volumes, shrimp is transported to storage; and in case of large volumes, transported straight to the place of consumption (at the wholesale markets of districts in the province, or provided to wholesalers outside the province).
5	Processing and exporting enterprises	Purchase and process raw shrimp for domestic consumption and export	Preliminary processing, and processing of White Leg shrimp products for domestic market and export.	Direct Purchase by contracts with traders and major-purchase dealers accounted for over 85% of sales. The entire amount of raw shrimp is provided to the processing plants. Before product enters the frozen warehouses for storage, the factory inspection division of the plant classifies shrimp according to size and quality. Poor quality shrimp will be returned.
6	Supporting agencies	Oversee and manage production and business activities	Issue documents on state management of fisheries in general, and White Leg shrimp in particular.	Inspect and supervise shrimp production and trading activities according to the current law provisions.

3.2. Value chain diagram of White Leg shrimp in Can Gio District

The participation of the factors in the growth, distribution, and sale of White Leg shrimp in Can Gio District is quite simple, with a detailed division of labor for each factor involved in each stage of the chain; each factor is a chain link that performs specialized activities (providing shrimp breed, aquatic feed, aquatic veterinary drug for shrimp, shrimp farming, purchase, processing, trading and consumption). Farmers are the central factor, producing White Leg shrimp

products for domestic and overseas markets. The chain operates through several market channels. However, only five main market channels transport large volumes of product, creating higher VA for the whole chain. The other channels are intermediate sized, or have very little product flow. Channels 1, 2, and 3 are domestic channels for fresh shrimp and processed products accounting for 21.91% of total White Leg shrimp output; channels 4 and 5 create processed and exported shrimp products accounting for 78.09% of total White Leg shrimp output (Figure 1).

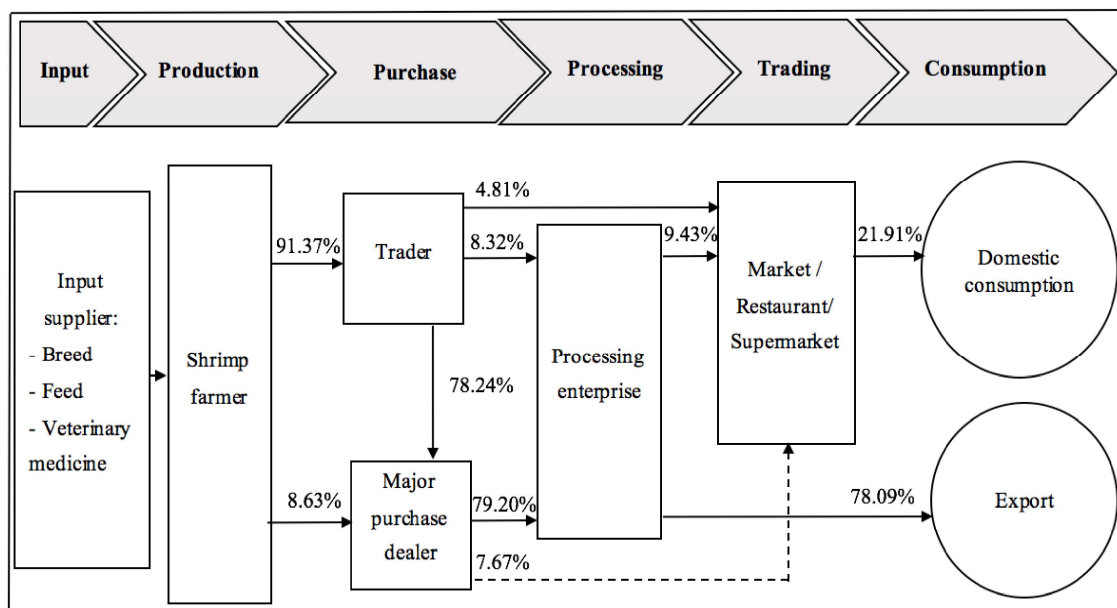


Figure 1. Diagram of value chain and distribution channels of White Leg shrimp in Can Gio District

- Channel 1: Shrimp farmer - Trader - Domestic consumption
 - Channel 2: Shrimp farmer - Trader - Processing enterprise - Domestic consumption
 - Channel 3: Shrimp farmer - Major-purchase dealer - Domestic consumption
 - Channel 4: Shrimp farmer - Major-purchase dealer - Processing enterprise - Export
 - Channel 5: Shrimp farmer - Trader - Major-purchase dealer - Processing enterprise - Export
- Shrimp farmers distribute their products through two vectors, traders (91.37%), and major-purchase dealers (8.63%). Traders often sell 78.24% of shrimp volume through major-

purchase dealers, 8.32% directly to shrimp processing enterprises, and 4.81% to markets, restaurants or supermarkets. The major-purchase dealers usually provide goods for shrimp processing enterprises (79.20%), and markets, restaurants or supermarkets (7.67%). After buying shrimp products, processing enterprises mainly export products to foreign markets (78.09%), and to local markets, restaurants or supermarkets (9.43%) through aquatic products supply clubs. All shrimp products from markets, restaurants or supermarkets are distributed directly to consumers in the country (21.91%).

3.3. Economic analysis of the value chain of White Leg shrimp in Can Gio District

Table 2. Distribution of benefits and costs in different groups of chain factors

Description	Shrimp farmer	Trader	M. purchase dealer	Processing enterprise	Total
Channel 1: Shrimp farmer - Trader - Domestic consumption					
Selling price (VND 1,000/ kg)	117.4	129.8			
Cost of inputs (VND 1,000/ kg)	79.2	117.4			
Cost increase (VND 1,000/ kg)	0.0	8.3			
VA (VND 1,000/ kg)	38.2	12.4			
NVA (VND 1,000/ kg)	38.2	4.1			42.3
% of NVA	90.3	9.7			
Output/factor (ton/year)	3.36	106.82			
NVA/factors (million VND/year)	128.35	437.96			566.31
% of NVA/factor/year	22.66	77.34			100.00
Channel 2: Shrimp farmer - Trader - Processing enterprise - Domestic consumption					
Selling price (VND 1,000/ kg)	117.4	129.8		155.3	
Cost of inputs (VND 1,000/ kg)	79.2	117.4		129.8	
Cost increase (VND 1,000/ kg)	0.0	8.3		23.4	
VA (VND 1,000/ kg)	38.2	12.4		25.5	
NVA (VND 1,000/ kg)	38.2	4.1		2.1	44.4
% of NVA	86.1	9.2		4.7	
Output/factor (ton/year)	3.36	106.82		1,177.32	
NVA/factors (million VND/year)	128.35	437.96		2,472.37	3,038.68
% of NVA/factor/year	4.23	14.41		81.36	100.00
Channel 3: Shrimp farmer - M. purchase dealer - Domestic consumption					
Selling price (VND 1,000/ kg)	117.4		141.7		
Cost of inputs (VND 1,000/ kg)	79.2		117.4		
Cost increase (VND 1,000/ kg)	0.0		21.6		
VA (VND 1,000/ kg)	38.2		24.3		

NVA (VND 1,000/ kg)	38.2	2.7	40.9
% of NVA	93.4	6.6	
Output/factor (ton/year)	3.36	361.57	
NVA/factors (million VND/year)	128.35	976.24	1,104.59
% of NVA/factor/year	11.62	88.38	100.00

Channel 4: Shrimp farmer - M. purchase dealer - Processing enterprise - Export

Selling price (VND 1,000/ kg)	117.4	141.7	155.3	
Cost of inputs (VND 1,000/ kg)	79.2	117.4	141.7	
Cost increase (VND 1,000/ kg)	0.0	21.6	11.4	
VA (VND 1,000/ kg)	38.2	24.3	13.5	
NVA (VND 1,000/ kg)	38.2	2.7	2.1	43.0
% of NVA	88.8	6.3	4.9	
Output/factor (ton/year)	3.36	361.57	1.177.32	
NVA/factors (million VND/year)	128.35	976.24	2,472.37	3,576.96
% of NVA/factor/year	3.59	27.29	69.12	100.00

Channel 5: Shrimp farmer - Trader - M. purchase dealer - Processing enterprise - Export

Selling price (VND 1,000/ kg)	117.4	129.8	141.7	155.3	
Cost of inputs (VND 1,000/ kg)	79.2	117.4	129.8	141.7	
Cost increase (VND 1,000/ kg)	0.0	8.3	9.2	11.4	
VA (VND 1,000/ kg)	38.2	12.4	11.9	13.5	
NVA (VND 1,000/ kg)	38.2	4.1	2.7	2.1	47.1
% of NVA	81.1	8.7	5.7	4.5	
Output/factor (ton/year)	3.36	106.82	361.57	1.177.32	
NVA/factors (million VND/year)	128.35	437.96	976.24	2,472.37	4,014.92
% of NVA/factor/year	3.20	10.91	24.31	61.58	100.00

* Channel 1: Input costs of the farmer is the production cost of 1 kg of raw shrimp (79.2 thousand VND/kg), shrimp sold directly to trader for 117.4 thousand VND/kg and the profit earned by farmer is 38.2 thousand VND/kg (accounting for 90.3% of total profit of the whole channel). Traders sell to consumer at 129.8 thousand VND/kg and profit earned is at 4.1 thousand VND/kg (9.7%).

* Channel 2: Selling price of raw shrimp and the profits obtained from the sale to trader remained constant compared with channel 1, but the percentage of profit received by farmer is lower (86.1% of the total profit of the whole channel). Traders sell raw shrimp to processing enterprises at the same price as selling to consumers at 129.8 thousand VND/kg and profit earned is at 4.1 thousand VND/kg (9.2%). Finally, processing enterprises sell to consumers at 155.3 thousand VND/kg and profit earned is 2.1 thousand VND/kg (4.7%).

* Channel 3: Not buying directly from a trader does not mean the major-purchase dealer is buying shrimp from farmers at prices higher than when buying from trader. As a result, the price and profits of farmers selling to major

chase dealers remain unchanged compared with channels 1 and 2 (representing 93.4% of the total profit of the whole channel). Then, the major-purchase dealers sell to consumers at a price of 141.7 thousand VND/kg and profit earned is 2.7 thousand VND/kg (6.6%).

* Channel 4: This is an export channel, therefore the selling price applied by processing enterprises is not lower than the selling price in domestic markets. Hence the selling price and profit of the factor remains unchanged compared to channel 2 and channel 3. However, the rate of profit of the factor is changed: farmer (accounting for 88.8 percent of the total profit of the whole channel), major-purchase dealer (6.3%) and processing enterprise (4.9%).

* Channel 5: Trader and major-purchase dealer are involved in this market channel and processing enterprise retains the role of deciding on the final selling price, but the total profit is higher than other channels (47.1 thousand VND/kg); in which, farmer profit accounts for most (81.1%) of the total profit of the whole channel, followed by traders at 8.7%, major-purchase dealers at 5.7%, and finally, processing enterprises taking 4.5%.

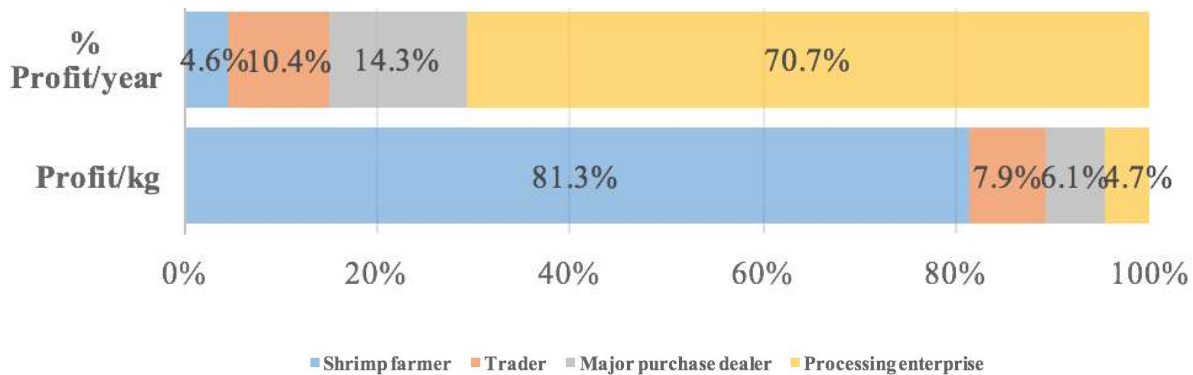


Figure 2. Profit distribution ratios in different groups of chain factors

As such, the distribution of average profits calculated on 1 kg through the value chain factors of White Leg shrimp is very reasonable; most of the profits are for farmer (81.3% of the total profit of the whole channel), trader (7.9%), major-purchase dealer (6.1%) and processing enterprise (4.7%). However, farmers are almost unchanged in terms of their annual production scale, whereas the scale of purchase output of trader, major-purchase dealer or processing enterprise have huge changes every year. This leads to the highest profit per year of processing enterprise (70.7%), major-purchase dealer (14.3%), trader (10.4%) and lowest for farmer

(4.6%). It is clear that this distribution of benefits is not reasonable and in harmony with the level of investment capital as well as the risks of the production process of farmers, even though the farmers are a very important factor creating original products for the next factor; farmers spend great effort but receive only the lowest benefits of the value chain.

3.4. Main inputs affecting shrimp farming productivity

Results estimating the relationship between shrimp output productivity and inputs in the Cobb-Douglas production function model are shown in Table 3.

Table 3. Results estimating the factors affecting shrimp farming productivity

Variables and coefficients	Regression coefficient	T-stat	P-value
Constant (C)	-2.016	-3.118	0.003
LnX1 - Ln(Investment cost per crop)	0.561	2.954	0.007
LnX2 - Ln(Feed conversion ratio)	0.384	2.442	0.021
LnX3 - Ln(Labor)	0.288	2.289	0.023
D1 - Experience	0.107	1.996	0.048
D2 - Farming pond environment	-0.084	-2.604	0.013
D3 - Disease	-0.098	-5.412	0.000
D4 - Training	0.082	2.107	0.031
F-Statistic	39.689		0.000
R2	0.847		
Adjusted R2	0.819		
Observations (N)	164		

The Cobb-Douglas function analysis gives a general description of farming households as follows:

$$\text{Ln}Y = \text{Ln}A + \sum_{i=1}^n \alpha_i \text{Ln}X_i + \sum_{j=1}^m \beta_j D_j \quad (2)$$

The testing results showed that the model ($F=39.689$) was perfectly matched to the actual situation with a level of statistical significance of 99%. The adjusted R2 coefficient in the model at 0.819 shows that change in shrimp productivity is caused by the variables inside the model at 81.9%, and that 18.1% of productivity change is caused by factors outside the model. This finding is entirely consistent with the variables included in the model and the actual White Leg shrimp farming situation observed in the district.

Table 3 determines that the regression coefficients of the independent variables, such as i

vestment cost per crop, food coefficient, labor, experience and training, are positive and have significance of over 95%. The regression coefficients of farming pond environment and disease variables reduce the shrimp farming productivity with a statistical significance of 95% or higher. This means that shrimp productivity fluctuates (increases and decreases) following the sign of regression coefficients.

Among the model factors that increase shrimp farming productivity, the household investment cost per crop exerts the greatest impact on productivity compared to other factors. As the household per capita investment cost increases by 1%, the farmer's shrimp productivity increases by 0.561% when other factors are held fixed. Because capital is a factor used directly

in the production process, the farmer's economic resources decide the selection of farming process investments, in machinery and equipment, feed, breed and human resources. For each crop, proper investment with adequate supplies of food, machinery and equipment brings about higher results. However, capital is always a limited resource for shrimp farmers. Particularly, disease variability impacts significantly on reducing shrimp productivity. In particular, under fixed conditions of other factors, if disease is not corrected in time, productivity decreases by 10.3% ($e^{0.098} = 1.103$) compared to non-infected households. Thus, the analysis shows that adequate investment in inputs is important for shrimp productivity.

3.5. A number of solutions to upgrade value chain of White Leg shrimp in Can Gio District

Enhancing product competitiveness: Factors involved in the chain will efficiently use production inputs, improve productivity, and reduce price compared to other countries in the region and the world, resulting in increased competitiveness of Vietnam's shrimp products on the international market.

Strengthening the links between the factors in the chain: Encouraging economic links between farmers and processing enterprises to reduce intermediaries will reduce costs. The five market channels analyzed show that the selling price and economic benefit for farmers are suppressed by the intermediaries in the channel (traders and major-purchase dealer). Forming a more direct channel between farmers and processing enterprises will reduce the loss in intermediate stages. This is a channel that should be encouraged rapidly to facilitate provision of large-scale output directly to enterprises and increase the farmer's working capital available for each shrimp crop. Besides that, to reduce market variability and risk, links between processing enterprises and major-purchase dealer, trader, shrimp farmer, and input service providers can be given greater stability through direct or indirect economic contracts, including purchase contracts associated with investment and underwriting. Participants can cooperate to improve the value chain as follows.

Input supplier: provide accurate product information, quality assurance, and offer large-scale distributed supply contracts.

Shrimp farmer: increase investment in inputs, improve control of pond environment and diseases, and exercise better quality control of shrimp products according to clean shrimp standards.

Trader and major-purchase dealer: agree on standard methods of purchasing and dealing with each establishment, and associate more closely with farmers and processing enterprises through purchase and sale contracts.

Processing enterprises: associate with other participants through effective consumption contracts for mutual benefit.

Promoting horizontal links between shrimp farmers: establish and develop cooperative groups, or other effective linkage models, to facilitate investment in irrigation, care-taking, harvesting, and aligning production with market requirements, not only in quality, safety and hygiene practices but also in certification of disease safety and especially traceability.

Enhancement of tracking systems for the market and disease: implement programs in mass media about the shrimp market, conduct statistical studies on price developments in the domestic and international markets, chronicle the epidemiological situation so that participating agents can best respond to risks.

Planning for safe farming areas: quickly invest in forming clusters and large-scale farming areas for White Leg shrimp. Invest in building infrastructure, focusing work on environmental protection. Encourage economic sectors to invest in production development of White Leg shrimp products under the Law of Domestic Investment and the current rules. Advise and support households to register their business in aquaculture, setting up business plans, and rearranging production so that organizations and branches can intervene to improve loan relations between farming households and the banks and credit institutions that serve them. Farmers can then have sufficient economic resources to invest in ponds and shrimp farming in accordance with best practice to reduce disease and control the pond environment. As a result, raising the productiv-

ity of shrimp cultivation, the profit of the farmer will increase.

4. Conclusion and Recommendation

4.1. Conclusion

Overall evaluation of the value chain of White Leg shrimp in Can Gio District, Ho Chi Minh City shows that there are 5 market channels and 4 factors directly involved in the chain, including: shrimp farmer, trader, major-purchase dealer and processing enterprise. Average profits calculated on 1 kg product is distributed quite reasonably between the participants involved in the chain but the distribution of average profits is not rational and fails to motivate stable and responsible development of raw White Leg shrimp production. While farmers create the highest profits (81.3%), the total profits during the year flows primarily to processing enterprises (70.7%). The cause of this situation is that the farmer only generates maximization profit on the cultivated land area, whereas the traders, major-purchase dealers and processing enterprises maximize the value added and enjoy greater profits based on raw material procurement and processing. At the same time, improving profit distribution by various initiatives will sponsor good control of disease and pond environment, and increase the productivity and efficiency of shrimp farming.

4.2. Recommendation

For the Department of Agriculture and Rural Development: To improve policies to facilitate and encourage actors to engage cooperatively in chain activities; to study specific lending policies for households involved in White Leg shrimp production. Enact preferential policies for White Leg shrimp export processing enterprises to expand the market, increase production and consumption prices.

For the local people's committee: To intensify the inspection, examination and supervi-

sion of shrimps and breeders, feeds, drugs and assorted chemicals in strict compliance with the provisions of current law, proactively handling cases of infringement.

With regard to the Institution and University, Department of Science and Technology: To strengthen the opening of training courses, sponsor more effective technology transfer to provide more knowledge on effective farming techniques and provide information on raw White Leg shrimp market and prices. To continue to perform research aimed at finding specific solutions for the development of the White Leg shrimp value chain, to enhance economic efficiency and the harmonious distribution of benefits between the factors involved, and support the sustainable development of White Leg shrimp products in Can Gio District.

Conflicts of Interest:

The author declare no conflict of interest

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