

## Linkage between Farm Households and Enterprises in the Production and Selling of Potato: A Case Study in Dong Trieu Town, Quang Ninh Province

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### Abstract

This study aimed to analyze the status of the economic linkage between farm households and Orion Vina Food Co., Ltd. enterprise in potato production and selling in Dong Trieu town, Quang Ninh province. The study was conducted through in-depth interviews with 136 farm households (62 linked and 74 unlinked) with the direct interview survey method, and collected data were processed using SPSS. The binary logit model was used to analyze the factors affecting the decision of farm households to join the linkage. The research results showed that the linkage brought benefits to both the farm households and the enterprise, but there are still some limitations. The decision of households to join the linkage was influenced by factors such as production area, production experience, agricultural extension training, and membership in a cooperative. In order to promote economic linkages between farm households and the enterprise, the solutions that need to be implemented include: i) Raising farmers' awareness about the role of linkages in potato production and selling; ii) Strengthening support for farmers in terms of the enterprise providing technology and inputs for production and purchasing potatoes; and iii) Encouraging the local government to support the establishment of cooperatives, strengthen agricultural extension training to attract households to join the linkage, and increase the efficiency of potato production in the town.

### Keywords

Linkage, farmer household, enterprise, production, selling, potato.

**Received:** August 23, 2023  
**Accepted:** September 13, 2024

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### Introduction

In agricultural production, linkage is the key to developing modern agriculture systems, ensuring the harmonization of the interests of stakeholders, and increasing efficiency in agricultural

production (Ho Thanh Thuy, 2017). Linking along the value chain and connecting agricultural product selling is becoming a new direction toward the goals of successfully digitalizing agriculture, meeting the world's agricultural trends, developing Vietnam's agriculture industry in a sustainable way, and increasing incomes for farmers in the integration period. Linkage models help members reduce production costs, overcome the limitations of each member, and create added value and more jobs, which contribute to increasing product competitiveness, and improving profit for enterprises and livelihoods for rural farmers (Nguyen Anh Tru *et al.*, 2012).

Dong Trieu town is located in western Quang Ninh province. This is a key agricultural production area of the province with agricultural product output reaching tens of thousands of tons per year. In order to support market development, linking product selling is a prerequisite that is a large concern of the locality in order to help farmers get rich in the fields. Previously, many fields in Binh Duong, Duc Chinh, and Binh Khe communes in the town only planted two rice crops/year. After the summer rice crop, the fields were often abandoned and grass was allowed to grow for several months, wasting land resources. But in the last eight years, after potato varieties were successfully tested, many households have found it suitable to intercrop rice and potatoes, bringing higher economic efficiency. However, the produced potatoes are mainly sold to traders or at markets. Farmers are forced to accept lower prices from traders and are affected by the situation of "good harvest and falling price". To improve production efficiency and product selling, with the support of local government offices and cooperatives, many farm households began cooperating with the Orion Vina Food Company, Ltd. (Korea) to provide commercial potatoes for snack processing. This linkage in the past years has helped stabilize production, bring high economic efficiency to farmers, and ensure sources of raw materials to meet the needs of the enterprise. However, at present, there are still some shortcomings in this linkage as well as the

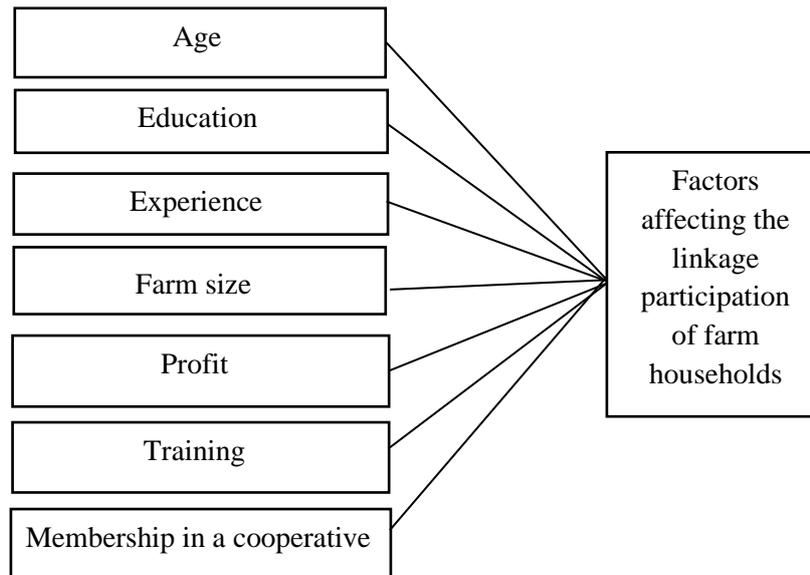
fact that many households have not joined the linkage.

Stemming from the above problems, this study aimed to analyze the current situation of the linkage between farm households and the potato processing enterprise, analyze the factors affecting the decision of households to join the linkage, and propose solutions to promote the linkage between the enterprise and farmers in potato production and selling in Dong Trieu town in the coming time.

## Methodology

### Research model

Linkages in production and business, especially in the agricultural sector, have always been a development direction encouraged by many economies in the world. These linkages can be a powerful mechanism to improve input and output markets as well as services to increase productivity and business efficiency (Omondi *et al.*, 2017). The output of linkages between actors has increased significantly (Vaart & Donk, 2008). Fabbe-Costes & Jahre (2008) also pointed out that stronger linkage relationships and higher levels of linkages lead to better business performances. Economic linkages aim to distribute benefits and risks among participants so that participating actors develop together. The economic linkage activities of enterprises with farmers express the relationship between two economic entities, but exploring this relationship more deeply reveals that this relationship is actually based on the input and output service activities of the enterprise serving agricultural production, including the provision of capital, materials, science and technology, and the selling of agricultural products produced by farmers through contracts. Related research can be found in Nguyen Dinh Phuc *et al.* (2017) and Nguyen Tien Hung *et al.* (2022). Research has shown that the education level, production area, number of years of production experience, agricultural extension training, and participation



Source: Survey results, 2023

**Figure 1.** Proposed research model on the factors affecting the linkage participation of farm households

in cooperatives have a great influence on the linkage participation of farm households with enterprises in production and the selling of agricultural products. On this basis, the researchers proposed a theoretical model (**Figure 1**).

### Data sources

Secondary and primary data were used in the article. Secondary information was collected from research papers, scientific articles, and the functional offices and cooperatives of Dong Trieu town on the status of potato production development in the area. Primary data were collected by the direct survey method by questionnaire for farm households and representatives of the enterprise and cooperatives. The research used the convenient sampling method (Saunders *et al.*, 2012). To ensure appropriateness and accuracy, before conducting the investigation, the research team conducted a pre-test and edited the form to be more suitable when conducting the synchronous survey. The size of the sample applied in the research was based on the requirements of multivariate regression analysis:  $N = 50 + 8 * m$ , where  $n$  is the minimum sample size required and  $m$  is the number of independent variables participating in the regression. Thus, the

minimum number of samples was  $50 + 8 * 7 = 106$  samples. At the time of the study, Dong Trieu town had 435 households that produced potatoes. To ensure that the number of samples collected was highly representative and suitable for the research objectives, the research team selected a convenient sample of 136 households, including 62 linked households and 74 unlinked households representing the whole study area.

### Data processing and analysis

Qualitative information was processed by arranging the data according to the discussion topics. Quantitative information was processed using Excel and SPSS 20 software. Descriptive statistics were applied in the study to describe and evaluate the current status of the economic linkage between the enterprise and potato-growing households. The comparative method was used in the article to point out some differences between the group of households participating in a linkage and the group of households not participating in a linkage with the enterprise. The study also used the logit model to evaluate the factors affecting the linkage participation of farm households with the enterprise.

**Table 1.** The independent variables in the logit model

Variable	Specification	Unit of measure
X <sub>1</sub>	Age of household head	Number of years
X <sub>2</sub>	Education level of household head	Number of years in school
X <sub>3</sub>	Years of experience growing potato	Number of years
X <sub>4</sub>	Farm size	Ha
X <sub>5</sub>	Profit	Million VND
X <sub>6</sub>	Training	Number of times
X <sub>7</sub>	Membership in a cooperative	1= Yes, 0 = otherwise

The linear form of the logit function is:

$$Y = \ln \{P_i / (1 - P_i)\} = \alpha + \beta_i X_i + \varepsilon_i$$

where P is the probability of linkage participation of farmer household; i presents the individual i;  $\alpha$  is the intercept;  $\beta_i$  is the coefficient of each variable  $X_i$ ;  $X_i$  is the main factor affecting the linkage participation of farmer household; and  $\varepsilon_i$  is the error term.

Specifically, the logit model is shown below:

$$Y = \ln \{P_i / (1 - P_i)\} = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \varepsilon_i$$

where the independent variables  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$ ,  $X_5$ ,  $X_6$ , and  $X_7$  correspond to age, education, experience, farm size, profit, training, and cooperative membership, respectively. These variables were found and put into the model based on the findings from previous studies as well as the actual survey results. These variables are explained in **Table 1**.

## Results and Discussion

### Status of linkage between farm households and enterprises in potato production and selling in Dong Trieu town

#### *Overview of Respondents*

The characteristics of linked and unlinked households in terms of age, education, household size, experience in growing potatoes, and farm size are shown in detail in **Table 2**. In both groups, most of the respondents interviewed were male. The household heads of the unlinked group had an average age of 50.46 - higher than the linked group (with an average of 47.26). With these average ages, the household heads of the

two groups have quite a lot of knowledge and experience in potato growing. Besides this, the level of education of the household heads as well as the experience of growing potatoes of the linked group were higher than those of the unlinked one. This may affect the ability of households to join the linkage. In addition, household size was not very different between the two groups.

#### *Forms of Linkage*

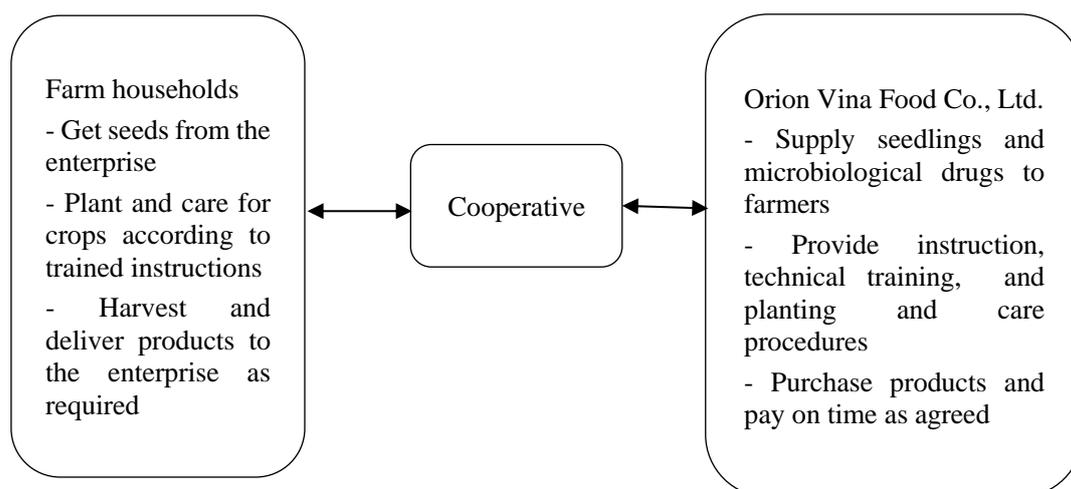
In the agricultural industry, there are two forms of chain links: horizontal links and vertical links. The horizontal linkage chain is made up of links between actors in the same stage of the value chain. Meanwhile, the vertical chain is a form of linking actors in different stages of the value chain (Tu Minh Thien, 2016). In Dong Trieu town, the link between farm households and the enterprise in potato production and selling is vertical, through the intermediary of a cooperative. Every year, Orion Vina Food Co., Ltd. signs contracts to buy products from farmers through the intermediary of cooperatives. This form of association brings many advantages. First, the enterprise does not have to negotiate directly with many small-scale farmers. The enterprise's management costs will be significantly reduced if it signs contracts with cooperatives instead of having to sign contracts with hundreds of individual farmer households. Second, the enterprise is supplied with a stable material supply in terms of quantity and uniformity in quality because cooperatives can help enterprises monitor and urge members to carry out the production process at the farm household level in order to achieve high output according the requests of the enterprise. Third,

**Table 2.** Characteristics of the household groups

Characteristics	Linked households		Unlinked households		Overall
	Number	Percentage %	Number	Percentage %	
Number of respondents	62	100	74	100	136
Gender					
Male	41	66.13	55	74.32	
Female	21	33.87	19	25.68	
Age of HH head (years)					
< 40	5	8.06	6	8.11	
40-50	36	58.06	28	37.84	
> 50	21	33.88	40	54.05	
Mean	47.26		50.46		49.00
Education level of HH head (years)					
Primary school (1-5)	18	29.03	34	45.95	
Secondary school (6-9)	30	48.39	35	47.30	
High school (10-12)	14	22.58	5	6.75	
Mean	6.73		5.68		6.15
Household size (persons)					
<3	15	24.19	15	20.27	
3-5	38	61.29	55	74.32	
>5	9	14.52	4	5.41	
Mean	3.61		3.59		3.60
Experience in growing potato (years)					
< 5	7	11.29	21	28.38	
5 - 10	50	80.65	48	64.86	
> 10	5	8.06	5	6.76	
Mean	7.37		6.79		7.02
Potato farm size (ha)					
Mean	1.48		1.06		1.28

the farm households are supported with seeds, farming techniques, and output products, which will help them feel secure in production and connect with the enterprise. In addition, members of cooperatives create collective strength when negotiating with the enterprise. The content of the economic links between farmers and Orion Vina Food Co., Ltd. is mainly that the enterprise is committed to ensuring the supply of seedlings, microbiological drugs against mold diseases, and technical support in the processes of planting, caring, and supporting tillage machinery and equipment, training farmers in the processes of planting and caring, and purchasing all products for the farmers. This linkage is shown in detail in

**Figure 2.** The contract between the enterprise and the cooperative is signed for each winter crop of each year. The reason for this is because the number of households and the area planted with potatoes for each household varies from year to year. Moreover, the purchase price of potatoes for each winter crop is different each year. Therefore, the contract is signed on an annual basis to avoid conflicts in the contract and to avoid damage to the Orion Vina Food Co., Ltd. and farmers as well as to minimize contract management costs. Currently, instead of using Chinese potato varieties for low yield and quality, most farmers are switching to Atlantic potato varieties for higher yield and quality. For



**Figure 2.** The linkage between farm households and Orion Vina Food Co., Ltd. in potato production and selling in Dong Trieu town

households participating in the linkage, Orion Vina Food Co., Ltd. will make a seed advance, and this advance will be considered a debt amount and converted into commercial Atlantic potato production after harvest with the calculation of 1kg equivalent to 3kg of commercial potatoes. In addition, the company also cooperates with agricultural extension stations of the town and cooperatives, organizes training sessions, and instructs farmers on planning, planting, care, and harvesting techniques according to modern standards.

In order to achieve high results in production, right from the beginning of the crop, the cooperatives discuss, agree, and sign a specific written contract with Orion Vina Food Co., Ltd. to supply seeds and this contract outlines the processes of selling output products by giving clear criteria on the quantity, quality, delivery time, payment method, and responsibility of each party.

Along with purchasing potatoes of the recommended size, Orion Vina Food Co., Ltd. also buys smaller potatoes to create conditions for farmers to have more income. In addition, the purchase price of potatoes that Orion Vina Food Co., Ltd. contracts with households is set depending on the market price, so there are no cases of controversy or complaints about the company's price. For the 2022 crop, the company purchased potatoes at a price of 10,000 VND kg<sup>-1</sup>, higher than the 9,800 VND kg<sup>-1</sup> that traders

paid. Therefore, the farmers participating in the linkage trust and feel secure in producing potatoes and supplying raw materials for the enterprise.

### **Benefits of the linkage**

Participating in a linkage with an enterprise, farmers receive many benefits such as access to input and output markets in the most favorable way; support on varieties and technical advice on planting and care from the enterprise; and a stable output price under the contract, all of which help potato growers reduce the risks of the output market when consuming their products (**Table 3**). The survey results showed that 88.00% of the respondents were satisfied and wanted to continue participating in the linkage with the enterprise. During the in-depth interviews, the representatives of Orion Vina Co., Ltd. said that the enterprise has a stable input volume with a marked increase in input quality (because the unit can strictly control the production process of related households). At the same time, with the advanced planning of the product purchasing time, the company's raw material procurement progress is guaranteed at an appropriate price.

Farm households participating in the linkage are greatly supported in the production process as well as in product selling. Participating in agricultural extension training courses is of great significance in helping households increase their awareness about linkages and technical

**Table 3.** Comparison of benefits of linked and unlinked households in potato production and selling in Dong Trieu town

Benefits of Linkage	Linked household	Unlinked household	Explanation
Get a seed advance	Yes	No	At the end of the season, the linked households return the product to the enterprise
It is more convenient to buy seeds	Yes	No	Linked households only need to register through the cooperative
Seed quality is guaranteed	Yes	No	Because unlinked households buy seed outside or keep seed by themselves, the quality of seed is not high
Technical support	More	Less	Linked households get regular training and more support
Packing, shipping to the place of sale	Yes	No	Linked households personally transport potatoes to the gathering point for the company to purchase; Unlinked households rely on traders actively coming to their house to buy
Get a partial cost advance	Yes	No	Seed cost
Signed for product selling	Yes	No	
Stable output price	Yes	No	Signing price when receiving seed

**Table 4.** Comparison of results and efficiency of potato production/crop between linked households and unlinked households

Result/ha/crop	Unit	Linked	Unlinked	Sig.
Cost	Million VND ha <sup>-1</sup>	50.02	51.11	0.112
Varieties	Million VND ha <sup>-1</sup>	5.18	5.18	-
Fertilizer	Million VND ha <sup>-1</sup>	7.57	7.35	-
Pesticide	Million VND ha <sup>-1</sup>	3.47	4.62	-
Labor	Million VND ha <sup>-1</sup>	33.78	33.96	-
Output	kg ha <sup>-1</sup>	12508	11612	-
Price	Million VND kg <sup>-1</sup>	0.01	0.0098	-
Revenue	Million VND ha <sup>-1</sup>	125.08	113.80	0.015
Profit	Million VND ha <sup>-1</sup>	75.06	62.69	0.008

improvements in potato cultivation to bring the highest efficiency. Meanwhile, unlinked households carry out almost all the stages by themselves, and agricultural extension training activities are also more limited than associated households. However, in the purchasing stage, traders go to the unlinked households to purchase potatoes while linked households need to transport their potatoes to the company's collection point.

**Table 4** shows the results of potato production of the two groups: linked and unlinked households. The results of the T-test show that the potato production cost of the two

groups of households had no differences at the 95% confidence level. However, the revenue and profitability of the two groups had differences at the 95% and 99% confidence levels, respectively. Specifically, the revenue and profitability of linked households were higher than those of unlinked households. This shows that revenue and profit may affect the participation of households in a linkage.

#### *Difficulties in Linkages*

From the above situation analysis, the benefits of joining the linkage for both sides (the enterprise and farm households) in potato production and selling are undeniable. However,

there are still difficulties in the implementation of the link.

The drafting of the contract content was done by Orion Vina Co., Ltd., while households only read and commented on the contract content accordingly. However, most households, due to limited qualifications, only partially understood the content of the contract when it was first read and they had to ask the representative of the cooperative to explain the terms of the contract in detail. The households accordingly, strictly complied with the signed contract. This shows the power of the enterprise in the linkage. The linkage contract is sometimes rigid, favoring the interests of the drafting party. Currently, the purchase price is still set by Orion Vina Food Co., Ltd., without the participation of producers.

There are also still problems with collection. According to the actual investigation, in some previous winter crops, there have been situations where some farmers did not follow the agreement with Orion Vina Food Co., Ltd. and sold their products to traders. When asked about the reason why, most of these households answered that they sold to traders mainly because Orion Vina Food Co., Ltd. requires too high quality of products and chooses too carefully, causing a large number of potatoes to be rejected. Therefore, some households chose to sell a part of their potatoes to traders because traders were not as selective as Orion Vina Food Co., Ltd., even though the trader's price was lower than the company's purchase price. On the company's side, in order to purchase products to meet production needs, the company always carefully

checks the quality of potatoes before importing the collection. This would not be worth mentioning if the enterprise had a clear purchasing and screening solution before the households packed and transported the products to the collection point. In fact, in many cases, the enterprise asked households to pour out all the potatoes and filter them according to the standards, making many households angry with the company's purchasing method because of the lost time, effort, and large number of rejected potatoes.

From **Table 5**, we can see that Orion Vina Food Co., Ltd. requires much higher quality standards than collectors. When forming a linkage with Orion Vina Food Co., Ltd., despite being supported with favorable conditions in production, households still spend more effort and time because they have to do more work than when selling to collectors. Moreover, because the collectors are all local, they are closer and more comfortable with the producers. Because of the above reasons, some households break their contracts to sell to traders without thinking about the long-term benefits of linkages in agriculture.

Another difficulty is that the farmers' access to market information is not really effective. The enterprise cooperates with the agricultural extension station to organize training courses on planting techniques, care, and pest control. However, content that provides information about product prices is almost never mentioned. This makes it easy for farmers to be forced to agree to prices by the enterprise.

**Table 5.** Comparison of potato selling by producers when selling to collectors with Orion Vina Food Co., Ltd.

Comparison criteria	Collectors	Orion Vina Co., Ltd.
Shipping home after harvest	Households may or may not have to transport them home	Households transport potatoes home or cover the fields to avoid getting wet
Product selection and packaging	Collectors sort and package	Households sift and bag
Shipping to the place of sale	Collectors come to each household to buy	Households transport the product to the gathering location
Commercial potato sizes	Can be small or big	Tuber diameter 5.5cm or larger
Packing specifications	None specified	Fully packed 31 kg bag <sup>-1</sup>
Standard of potato tubers	Potatoes are not broken or rotten	No cracks or sprouts; Tubers are not green, rotten, or broken
Payment	Pay immediately after purchase	At the latest, 30 days after purchase

### Factors affecting the linkage participation of farmer households

The binary logistic regression model was used to evaluate the factors affecting the linkage participation of farm households, with seven groups of factors, namely age, education, experience, farm size, profit, training, and group membership, and the dependent variable Y was the probability of linkage participation of the farmer household. The results of the model are shown in **Table 6**. From the Chi-square test, we rejected the null hypothesis that the coefficients of the independent variables are zero because Chi-square = 67.717 with Sig. = 0.000 < 0.001. Also, the value -2 Log likelihood = 78.287 was not too high, which represented a good fit of the analytical model. Moreover, the correct prediction rate of the model was 86.0%.

From **Table 6**, it can be seen that experience, farm size, training participation, and cooperative membership significantly influenced the linkage participation of farm households. As such, the linear form of the logit function was:

$$Y = 0.643 * \text{experience} + 0.104 * \text{farm size} + 0.754 * \text{training} + 2.584 * \text{cooperative membership}$$

The result of calculating the odds ratio expressed by the  $\text{Exp}(\beta)$  coefficient in **Table 6** also showed that the group's membership in a

cooperative was the factor that had the greatest influence on linkage participation of farm households with the  $\text{Exp}(\beta)$  coefficient of 13.249. In addition, the influence of each factor was expressed as follows:

**Experience:** The more experience, the higher the likelihood of joining a linkage. Specifically, if the number of years of experience increased by 1, the ability to join a linkage would increase by 1.901 times. With many years of experience, a household is able to recognize the risks in potato production and selling and the gradual decrease in yield. Therefore, households would find it beneficial to access and participate in a linkage to respond to market changes.

**Farm size:** The larger the farm size, the greater the ability to join a linkage. If the farm size increased by 1 ha, the ability to join linkage would increase by 1.110 times. This is appropriate because the larger the potato growing area, the higher the potato production of the household, so the household would tend to join the association to facilitate product selling.

**Participation in training:** Participation in linkage training courses influences the decision of households to join a linkage. If the number of times of participation in training courses of a household increased by 1, the ability to join linkage would increase by 2.127 times. When

**Table 6.** Result of the logit model of factors affecting the linkage participation of farm households

Variable	Coefficient B	Standard error (S.E)	Wald	DF	Sig.	Exp(B)
Age	-.096	.063	2.326	1	.127	.908
Edu	-.063	.161	.154	1	.694	.939
Experience	.643**	.282	5.180	1	.023	1.901
Farm size	.104**	.043	5.957	1	.015	1.110
Profit	.001	.003	.336	1	.562	1.001
Training	.754**	.351	4.633	1	.031	2.127
Cooperative membership	2.584**	1.207	4.587	1	.032	13.249
Constant	-6.997	8.695	.648	1	.421	.001

Samples = 136    -2 Log likelihood = 78.287  
 Chi-square = 67.717    Sig for Chi-square = 0.000  
 Predicted = 86.0  
 Note: \*\*: significant at 5%

participating in these training courses, households will learn planting, caring, and harvesting techniques, and how to solve problems in the production process as well as increase their awareness of the benefits of a linkage.

Membership in cooperative: If the household is a member of a cooperative, the ability to join a linkage increases by 13.249 times. This could have been due to the relatively good propaganda from the cooperative. Households can learn from each other, share experiences and difficulties in the process of potato production, and be shown the benefits of linkages. In addition, the collective strength is also enhanced because the cooperative is the representative of households signing contracts with the associated enterprise. Encouraging households to participate in a cooperative is necessary to strengthen the linkage between farmers and the enterprise in potato production and selling in the town.

### Discussion and Solutions

The research results present the current situation of the linkage between farmers and the Orion Vina Food Co., Ltd. enterprise in potato production and selling. This linkage has brought benefits to the participants such as farm households being supported in production, ensuring the selling of output products, and enterprises having stable sources of raw materials. Do Thi Nga & Le Duc Niem (2016) also pointed out that linkage creates conditions for linking farmers and enterprises in the direction of long-term stability, harmonizing economic interests, improving competitiveness, and developing sustainable agriculture. However, there are still difficulties in the implementation of the linkage. The enterprise signs contracts to purchase products from farmers through cooperatives. The content of the contract is drafted by the enterprise, with almost no participation of households. The constraints in the linkage mainly focus on product quality, and commitments on quantity as well as purchasing methods are less focused by the enterprise. In the linkage between potato growers and enterprises, enterprises are the agents with greater power (Nguyen Thanh Phong & Nguyen Phuong Le, 2021). Research has also shown that experience,

farm size, training participation, and cooperative membership significantly influence the linkage participation of farm households. These factors are also shown in the research of Nguyen Dinh Phuc *et al.* (2017) and Nguyen Tien Hung *et al.* (2022). Based on these research results, in order to strengthen the association of potato growers with enterprises, develop stable raw material areas for enterprises, as well as contribute to raising incomes for households, we recommend implementing the following necessary solutions.

First, it is important to strengthen the capacity of farmers. Linking with an enterprise means that farmers have joined the product supply chain with strict requirements on quality and labor safety as well as ensuring economic, societal, and environmental benefits. Therefore, in order to promote sustainable linkages between farmers and enterprises, it is necessary to raise the awareness of farmers about the role and necessity of linkages in strengthening the power of households in the supply chain of potatoes and improving the production organization capacity of farmers, including the strict application of production, care, and harvesting processes to improve product quality and meet the requirements of the enterprise.

Second, Orion Vina Co., Ltd. needs to strengthen its measures to support farmers in potato production and selling. It can do this by (i) strengthening staff (both in number and qualifications) to ensure better technical advice is provided to farmers, and that staff are better able to manage and supervise the production process of farmers; (ii) encouraging and strengthening the participation of households in the terms of the contract to help them better understand the requirements of the linkage; and (iii) having solutions to handle the purchasing stage appropriately, such as preventing households from wasting effort and time on sorting and packing potatoes as well as supporting households to consume substandard potato output.

As for the local government, Dong Trieu town's People's Committee needs to create favorable conditions for a mechanism to help enterprises perform well as the core and leading role in the linkage. The local government should

also support the establishment of cooperatives, encourage households to participate in cooperatives, strengthen agricultural extension training to attract households to join the linkage, and increase production efficiency in addition to raising awareness among farmers about the benefits of linkage in potato production and selling.

## Conclusions

Linking plays an important role in the production and trading of agricultural products by contributing to ensuring the participation of all parties; increasing the voluntariness and self-responsibility of the parties involved in the linkage; increasing efficiency in agricultural production; and improving efficiency and the state of the management role in an agricultural economy. The linkage between farm households and Orion Vina Food Co., Ltd. enterprise in potato production and selling in Dong Trieu town focuses on the areas of product selling, seed support, and production and technical training. The linkage has brought tangible benefits to both sides and has partially solved the existing difficulties of potato producers such as learning new farming techniques, improving product quality, having access to inputs, and selling products. However, maintaining and developing linkages between farmers and the enterprise still has many limitations and challenges, especially in compliance with production processes, product selling, and support policies. Factors affecting the linkage participation of farm households were shown to be experience, farm size, training participation, and membership in a cooperative. To promote sustainable linkages between farmers and enterprises in potato production and selling, it is necessary to: i) Improve the production organization capacity and farmers' awareness about the role of linkages in increasing household power in the potato supply chain; ii) Strengthen support for farmers from the enterprise in terms of production techniques and access to input materials; and iii) Encourage local authorities to create favorable conditions on mechanisms to help businesses perform their core roles well, lead the formation of linkages, and propagate and raise the

awareness of farmers about the benefits of linkages in potato production and selling.

## Acknowledgments

Firstly, we would like to express our sincere gratitude to VNUA's support for research No. T2023-11-48. Secondly, we would like to thank the support of the local authorities, cooperatives, and Orion Vina Co., Ltd. as well as potato farm households in Dong Trieu town, Quang Ninh province who made major contributions to the survey for this research. Finally, we would like to acknowledge the research team members for their contributions in collecting and analyzing data for this research.

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