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ANALYZING THE IMPACT OF SELECT FACTORS ON INVESTMENT DECISIONS FOR AGRICULTURAL DEVELOPMENT UNDER THE GAP OF HOUSEHOLDS IN NINH THUAN, VIETNAM

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Abstract

This paper was conducted to study the effects of the factors to decide the investment for agricultural development under the GAP (Good Agricultural Practices) of households in Ninh Thuan province, Vietnam. Binary logistic regression methods associated with sample weights are used for this research. The result showed that participation GAP would help farmers get higher profits from selling products with better price, and get more support from the government. At the same time, the study also showed that there were six positive and one negative factor that impacted the ability of farmers to participate GAP. In the six factors that have a positive impact, the three factors that impact strongest are market demand, selling price and government support.

Keywords: GAP, Investment and Development, Agriculture, Farmers, Ninh Thuan – Vietnam

INTRODUCTION

Ninh Thuan is one of the most popular provinces in Vietnam for grape and apple ber products. In recent ten years, the demand for clean products is increasing with the requirements more stringent on product quality. Food safety is considered one of the most important attribute groups of product quality including food safety, nutrition, value and packaging (Hooker and Caswell, 1996). According to Caswell (1998), food quality assurance, especially food safety, a growing concern among governments, businesses and international organizations involved in setting standards for GAP (Good Agricultural Practices) because the food quality attributes are becoming increasingly high in all areas related to food production and processing. To meet that

requirement, GAP was born in the late 90s. According to FAO, GAP is the process of growing practices, on-farm processing towards the sustainability of the environment, economy and society and resulting safety and quality of agricultural products. GAP is based on four dimensions: economic viability, environmental sustainability, social acceptability and quality of food safety (Mushobozi, 2010).

Therefore, development of clean and safe agricultural production is an urgent problem nowadays. Development of agricultural production in accordance with GAP standards is very necessary for Vietnam's agriculture in general and Ninh Thuan province in particular, enabling them enter the world's largest market, increasing value and profits for farmers and businesses. In addition, GAP production also ensures the safety of consumers and producers, as well as protects themselves from the harmful agricultural supplies and helps protect the environment in rural areas.

This study focused on the factors and their impact to the investment decision under GAP standards of farmers, based on which, the author made four recommendations to stimulate investment in agricultural development of farmers under GAP standards.

LITERATURE REVIEW

According to WHO and FAO (2009), the food safety is a concept that will not cause any harm to the consumer when it is processed or used for the right purposes ... food safety hazards as the chemical, biological or physical in food cause food insecurity and damage the health of consumers. Consumers are very concerned about food safety because of a lot of unsafe food cases have occurred in the past decade and still happened (Loc, 2006). According to Ministry of Science and Technology (2007), whenever it comes to food safety must think of the presence of food safety hazards.

According to Ministry of Agriculture and Rural Development (2014), program monitoring biological contamination and residues of chemicals in agriculture has taken 450 samples of three types of vegetables (sauropus, string beans and spices) in production areas at the harvest of 11 provinces / cities. There were 350 samples tested that contained pesticide residues, 100 samples tested had microorganisms. The results showed that the samples did not qualified 21/100 E. coli (21%), 19/350 samples with residues exceeding the permitted limit (5.43%). This data shows that the food safety situation in our country does not ensure the requirements of consumers and the market. The products that unsafety are still relatively high. Nowadays, food industry not only responsible for producing safe food but also clearly demonstrated food safety has been secured like in the manufacturing process.

According to Henson and Caswell (1999) the reaction of potential consumers to the risk of food safety and the costs as a consequence that the company incurs as motors for the food processing the conduct of preventive measures to minimize the risks by changing their production processes.Government is regulation of quality standards and control implementation, and support the implementation in order to meet quality requirements. Since GAP is being driven by factors of demand so important challenge is to ensure the use of expanding GAP will bring benefits to manufacturers small scale in developing countries, economy and the sustainability of domestic production.

According to research by Trang (2016), based on survey data of 130 basis vegetable production (according to GAP in Vietnam) has concluded there are three groups of factors impact the ability to participate in GAP base of vegetable production are: (1) factors on the basis of vegetable production, (2) the factors belonging to clients and (3) factors that belong to the government. Based on study results suggested a number of measures as government policy makers need to manage and support, implementation and control of production and consumption of vegetables GAP; of vegetable production base, as well as commercial customers, industry and consumers to raise awareness and the ability to produce and consume vegetables GAP.

Hobbs (2003) has classified the benefits of GAP into two main groups, the first is to help reduce the cost of production for farmers through efficient use of labor, input selection reasonable and applied management methods good. In a case study in Kenya, GAP significantly reduce the production costs of fresh vegetables. This production method significantly improves production efficiency in terms of social, environmental and economic. GAP helps farmers better control costs by applying the appropriate cultivation techniques. Second is to contribute to the product reaching GAP, GAP helps improve product quality product which helps GAP occupy the high-end market. However, when supply products GAP is increased, the risk of falling prices is inevitable as the inevitable trend of the market.

METHODOLOGY

Research site

Ninh Thuan is a province in the South Central Coast with agricultural products is characterized Grapes and Apple ber with plantings each product in turn is 1226 hectares and 1050 hectares of which 280 hectares of grapes and 47.2 hectares of productive investment apple ber GAP standard, this area concentrated mainly in five districts / cities of the province including: Phan Rang - Thap Cham, Ninh Son district, Ninh Phuoc district, Ninh Hai district and Thuan Nam

with a total annual production of about 14158 tonnes and 40205 tonnes of apples Grapes (Department of agriculture and rural Development in Ninh Thuan province, 2015)

Data collection

The data were collected from surveys of households in Ninh Thuan using standardized questionnaires. Primary data was collected in Ninh Thuan to the size of 200 households, of which 100 households GAP represents 88 groups register link GAP in the province and 100 households production according to GAP in 5 districts of the city. Establishments are stratified according to local group associated with the link. Ninh Thuan has a total of 88 linkage groups register GAP (Vietgap.com.vn) with a total size of about 1,272 households, of which the city of Phan Rang - Thap Cham 27 linkage groups, Ninh Hai District 26 group, Ninh Phuoc district has 20 groups, 10 groups Ninh Son district and Thuan Nam district has 5 groups. The research based on the size of the local affiliate group to select the group surveyed, then surveyed households in the selected group according to a random sampling method.

Data analysis methods

Model evaluated the impact of these factors to the decision to invest in developing agricultural production of farmers under GAP standards using regression Logictis to assess the impact of the seven factors of three groups of factors to decide to join GAP farm. Including:

+ *Age of the head of household*: The household head is usually the decision to the production and business activities of the household. According to Hoang (2013) age often affects the ability to accept and apply new knowledge in production and capital investment capacity for technological applications into production.

+ *Experience the householder*: Hosono (2007) are mainly farmers invest in agricultural production in accordance with their common experience, thus creating a conflict with the GAP (as fertilizing, watering, and control inputs).

+ *The market demand*: Weatherspoon and Reardon (2003) that require cleaning products to goods already becoming popular even in poor areas, this has prompted farmers to participate in agricultural production under GAP standards. From research by Hobbs (2003) can be concluded that the market can play a driving role for the development of agriculture in the GAP.

+ *Profit Average*: According to Uday Pandit et al. (2017) raise the net income of farmers GAP also has a positive effect in promoting farmers under GAP.

+ *Price*: Pongvinyoo el al (2014) also suggested that market prices local coffee does not affect the farmers to decide to grow coffee under GAP standards so often chosen method of selling products normally instead of product classification.

+ *Understanding GAP of the householder*: Pongvinyoo el al (2014) asserted that understanding GAP of the farmers have a positive impact on the ability to participate in the production under GAP standards of the household in which the knowledge of farmers influenced by the factors of years of schooling of farmers, the area under cultivation by farmers and the confidence of the farmers have a positive impact and significance of awareness of understanding GAP farmers, farmers also experience a negative impact on cognitive understanding of the household GAP.

+ *Supports from government*: Takahiro et al. (2014) also suggested that the government's support for in-depth training for farmers on GAP will promote farmer participation in agricultural production according to GAP. Government plays an important role in supporting the production base application of food safety standards, including GAP (Hanak et al, 2002; Wannamolee, 2008). Policy of state support for other actors in the production chain as consumers also mentioned (Srimanee and Routray, 2011). Government management through the provisions applicable standards of food safety specifically with the safety levels of different food products must meet and control the compliance with regulations (Henson and Caswell, 1999 ; Ogus, 1994).

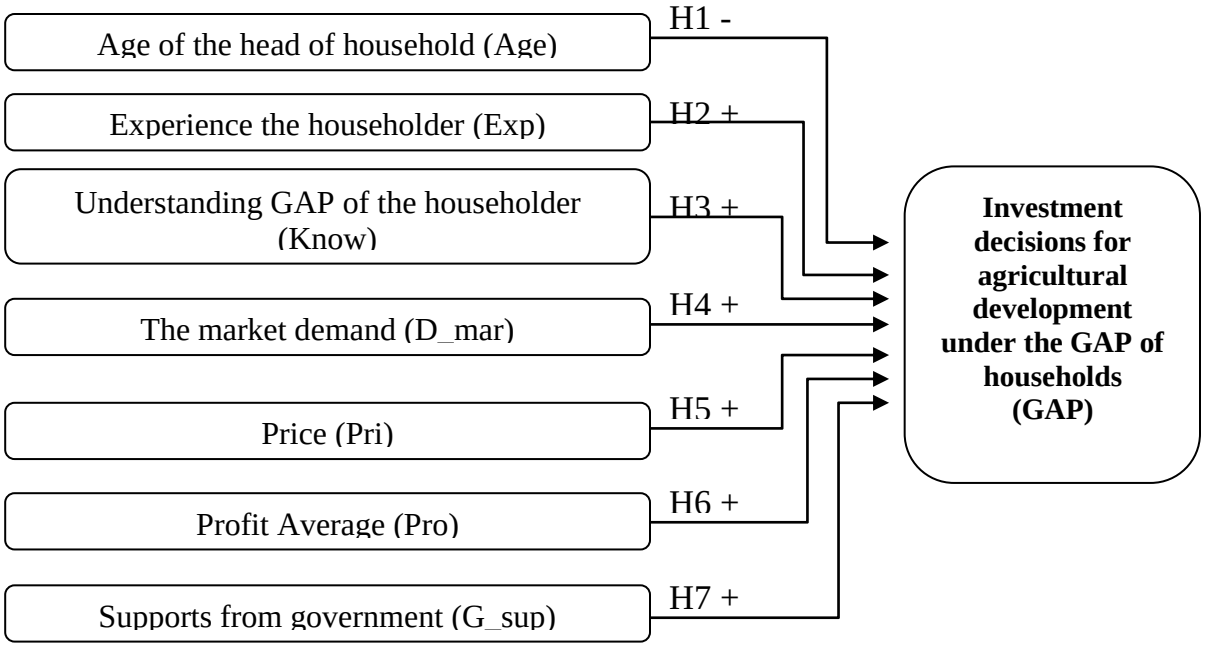

Figure 1: Model of impact assessment of the factors to decide to invest under GAP standards of households

(Source: author's synthesis)

According to statistics there are about 6,360 households producing agricultural products Grapes, Apples ber, garlic and vegetables in the province of Ninh Thuan of which about 1,272 households GAP standard (statistics of the Department of agriculture and rural development in

the province Ninh Thuan) so to improve the fit of the regression model, I conducted weights for observations before logistic regression with weighted of household production according to GAP is 1272/100 = 12,72 and the weight of the agricultural producers are not under GAP standards is 5088/100 = 50.88.

RESULTS AND DISCUSSION

Descriptive statistics of variables

Table 1. Descriptive statistics of variables (SPSS 20.0 output)

No.	Variables	Explanation of variable	Mean	Std. Deviation	N	Difference	
						Xi(GAP=1)-Xi(GAP=0)	Sig.
1	Age (GAP=1)	Age of household head (GAP=1)	46,72	9,272	100	-0,95	,459
	Age (GAP=0)	Age of household head (GAP=0)	47,67	8,835	100		
2	Exp (GAP=1)	Experience the householder (GAP=1)	13,19	7,298	100	-2,44	,029
	Exp (GAP=0)	Experience the householder (GAP=0)	15,63	8,31	100		
3	Pri (GAP=1)	Selling price (GAP=1)	18,91	0,743	100	2,42	,000
	Pri (GAP=0)	Selling price (GAP=0)	16,49	0,786	100		
4	Pro (GAP=1)	Profit Average of $1000m^2$(GAP=1)	47,47	8,596	100	15,37	,000
	Pro (GAP=0)	Profit Average of $1000m^2$ (GAP=0)	32,1	4,833	100		
5	D_mar (GAP=1)	The market demand (GAP=1)	4,9	0,302	100	1,38	,000
	D_mar (GAP=0)	The market demand (GAP=0)	3,52	0,745	100		
6	G_sup (GAP=1)	Supports from government (GAP=1)	3,66	0,602	100	0,56	,000
	G_sup (GAP=0)	Supports from government (GAP=0)	3,1	0,727	100		
7	Know (GAP=1)	Understanding GAP of the householder (GAP=1)	3,84	0,893	100	1,64	,000
	Know (GAP=0)	Understanding GAP of the householder (GAP=0)	2,2	1,014	100		

Results Table 1 shows no differences in age between the two groups produced according to GAP and not according to GAP, the average age is 46.72 years old GAP group. The experience of group GAP production lower than the other group mean of 2.44 years, the average value of the GAP is 13.19 years. GAP standard products with higher price products typically 2.42 million VND / ton price of about 18.91 million VND per / ton. The average profit of the GAP is also higher than 15.37 million VND meaningful / 1000m2 / year at approximately 47.47 million VND per / 1000m^2 / year. Market demand of products reached an average of 4.9 points GAP higher product usually means 1.38 points. Government support for the GAP also significantly higher than the average 0.56 points to reach 3.66 points. Understanding of GAP for farmers group GAP production reached an average of 3.84 points higher than the remaining 1.64 points. Thus it is possible that the application of agricultural production under GAP standards to help farmers improve understanding of GAP, products with better prices and higher profits, while also getting more support from the government.

Verification of conformity of the model

Table 2: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	5957,199	7	,000
	Block	5957,199	7	,000
	Model	5957,199	7	,000

Verification Tests of Model Coefficients Omnibus in table 2 result Sig. = 0.000 <0.01. So can reject the null hypothesis β1 = β2 = ... = β7. Thus, the 99% significance level can conclude regression model was fit.

Table 3: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	407,920[a]	,608	,961

a. Estimation terminated at iteration number 10 because parameter estimates changed by less than ,001.

Index -2 log likelihood = 407, 920 in Table 3 are quite small exhibit a pretty good fit of the overall model.

Classification Table participating households produced according to GAP standard and not according to GAP standards according to two criteria are observed reality and predictions are as follows:

Table 4: Classification Table[a]

			Predicted		
			GAP		Percentage
	Observed		0	1	Correct
Step 1	GAP	0	5037	51	99,0
		1	38	1234	97,0
	Overall Percentage				98,6

a. The cut value is ,500

Through table 4 shows the 5088 observed cases are not produced according to GAP standard, the anticipated 5037 production absence GAP, this ratio is 99% correct predictions. In the cases observed in 1272 GAP standard production, anticipated production in 1234 cases under GAP standards, this ratio is 97% correct predictions. Thus average 98.6% correct predictions. This represents a highly relevant when using this model to predict the ability to participate in the production of household GAP production.

The impact of these factors to the decision to invest in developing agricultural production of farmers GAP

According to survey results from 200 households (join GAP and not join GAP) with the help of SPSS 22.0 , the author conducted weights and regression models to assess the impact logictics of factors to decide to invest in developing agricultural production under GAP standards.

Table 5: Results of regression model

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age	,134***	,028	23,304	1	,000	1,143
	Exp	-,183***	,030	36,952	1	,000	,833
	Know	,421**	,173	5,893	1	,015	1,523
	D_mar	2,938***	,366	64,480	1	,000	18,874
	Pri	1,968***	,189	108,916	1	,000	7,158
	Pro	,336***	,032	108,456	1	,000	1,399

Table 5...

G_sup	1,313***	,286	21,090	1	,000	3,718
Constant	-71,423	4,348	269,857	1	,000	,000

a. Variable(s) entered on step 1: Age, Exp, Know, D_mar, Pri, Pro, G_sup.

b. Note: (*) Indicates that the coefficients are significant at 10%. (**) Indicates that the coefficients are significant at 5%. (***) Indicates that the coefficients are significant at 1%

Through regression model results shows 6 turn impact positively on investment decisions GAP farm with a significance level of 95% is the household head's age, understanding of GAP, market demand, selling price, average profit and support government subsidy. In particular, variable market demands, average prices and support the government's strong impact on the ability to participate in GAP farm, this could explain that farmers often agricultural production based on the market combined with the support of government, if the product needs to achieve major GAP, GAP products meet high price and received a lot of support from the government, the farmers will tend to switch production according to GAP. Meanwhile, turn the experience of all households to adverse effects to the decision to invest in GAP farm with a significance level of 95%, which explains the characteristics of the farmers in our country tend little change as experienced, it can be concluded that the majority of farmers in agricultural production mainly based on experience and difficult to access new technologies as had long experience.

CONCLUSION

Development of agricultural production according to GAP is an inevitable trend now, it brings many advantages in agricultural production and improve economic efficiency, protect ecological environment. This research is based on survey data from 200 households Wine and Apples in Ninh Thuan has shown that production under GAP standards profit higher average selling prices better and get more support from the Minister. Research using model logistic result of 6 factors that impact positively on the ability to engage producers in GAP farm are arranged in order of impact decreasing market demand, price , government support, understanding of GAP, the average profit and the age of the household head. Besides having a negative impact variable is the experience of the household head.

Based on study results, the author proposes a number of recommendations aimed at stimulating household investment in the development of agricultural production according to GAP as follows:

+ First, there should be measures to stimulate the market products under the GAP development, want so firstly government should promote sewn market management to eliminate

the substandard food safety, in addition to managed products GAP to avoid counterfeit, substandard is marketed cause distrust from consumers.

+ Second, farmers need to classify products and sales GAP correct product distribution channels GAP to obtain higher prices, while confirming the brand GAP. Need to curb production in GAP but sold as products usually or often mixed with products to sell will seriously affect the confidence of customers.

+ Third, Government should have supported the plan effectively for farmers joined GAP also should introduce policies to support farmers not participating GAP but intend or have participated in GAP conditions.

+ Fourth, farmers need to be proactive in learning about GAP, gradual change production practices the old style (fragmented, spontaneous, conservative, ...) bring technical progress into production, and compliance strict manufacturing processes of GAP to create quality products, capable to compete in the market.

The current research conducted an investigation in Ninh Thuan province of Viet Nam; therefore, survey sample sizes could not make generalizations of the current situation of the whole territory of Vietnam. In further research, the author will conduct data surveys in the region or the entire territory of Vietnam

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