Agricultural Commodity Development: A Case Study Of Farming Households In Chau Thanh A District, Hau Giang Province

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---ABSTRACT---
The research aims to identify factors affecting the decision in agricultural commodity development of households who join into planting orchards in Chau Thanh A district, Hau Giang province. The data of this paper was collected from 150 households who practiced mango, orange and rice farming and the research applied quota sampling method. Also, a binary logistic method was employed to identify influential factors in the households' decision on agricultural commodity development. The results showed that positively influential factors in the decision of agricultural commodity development including levels of education, agricultural land, capital, technical training, infrastructure, output market, geographical location, and the feature of soil and water sources. Noticeably, technical training has been the most significant factor that impacts households' decision on agricultural commodity development in Chau Thanh A district, Hau Giang province.
KEYWORDS - farming, decision, development, agricultural, commodity
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I. INTRODUCTION

Hau Giang province belongs to Mekong Delta which was formed in 2004 due to the separation of the original Can Tho province. Nowadays, Hau Giang province is constantly strengthening agricultural development, especially stimulating agricultural commodity progress. Located in the north of Hau Giang province, Chau Thanh A commune is convenient for trading and it is also a hot spot for social and economic development. Though Chau Thanh A is newly formed, it is considered to be a leading commune in economic development. Observably, this commune has significantly transformed in various aspects, especially in agricultural development. The land area of this hot spot is mainly used for agricultural purposes. At the end of 2016, the total natural land of Chau Thanh A was 15,600 ha. Particularly, there were 86.42% of the agricultural land and 13.58% of the non-agricultural land. Its land and weather conditions are favorable for agricultural cultivation, especially farming. According to statistics in 2016, Chau Thanh A district's agricultural development contributed 1,497 billion VND to the national budget. In particular, farming constituted 82.02% of the total agriculture production value in the district with the cultivation of rice, vegetables, mango, and orange, etc. The rice land area made up 24,850 ha, with its yield over 6,329 tons/ha. In addition, the orchard farming area was up to 1,869 ha including 906 ha of mango farming, 502 ha of orange farming, and 205 ha of longan farming. Almost all of the orchards bring economic benefits and high income to the local households from 500 to 200 million VND/ha, there were also some farmers gaining from 300 to 400 million VND/ha.

In recent years, the agriculture of Chau Thanh A district has developed, and the shift in economic structure has transformed positively. According to Directive 2039/CT-BNN-KH of Ministry of Agriculture and Rural Development of June 20th, 2013 on practicing the agriculture restructuring proposal that follows the trend of value-added enhancement and sustainable development. Also, Chau Thanh A district has focused on stimulating agricultural restructuring and rural economy in the pattern of taking advantages of the natural features of every orchard and livestock. Also, the district is concurrently transformed orchard and livestock restructuring into commodity processing to enhance value and quality of products so that the rural locals could gain more financial benefits and improve their living standard. Besides, Chau Thanh A district has proposed various policies to promote the development of collective economics with an aim at making breakthroughs in agriculture. Following Directive of orchard and livestock farming restructuring in the 2014-2016 period with the orientation of agricultural reorganization in 2020, Chau Thanh A district has intensively directed the locals to restructure their orchard and livestock farming and develop the practice of household economics. In recent years, the rate of orchard farming has quickly progressed in Chau Thanh A. Nevertheless, all of its potentials have not been exploited yet, and there have only been small fragmented production and inconsistent product quality. For this reason, there is a need for Chau Thanh A to practice orchard farming restructuring in commodity trend.

II. RESEARCH METHODS

2.1 Theoretical foundations and research framework

Agricultural restructuring refers to the changes in branches of farm regions (Le, 2006). According to Nguyen (2011), agricultural reorganization implies restructuring agrarian labor sources to enhance the high yield of different farm branches. Mainly, branches with higher labor productivity would have better densities. In addition, Phimmasone and Ngoan (2015) view that farming restructuring in commodity production trend is the process in which farming restructuring has gradually progressed in various and specialized agricultural products to meet the need of markets so that farmers could gain more money benefits and tackle social problems such as food security, poverty, and starvation, environmental issues, etc. For this reason, agricultural restructuring is affected by various factors, especially three primary sources that significantly influence the restructuring trend in commodity production namely family sources, natural conditions, and social-economic conditions.

Age and experience of the labor force directly impact the decision of developing agricultural commodity trend

Age of current labor force is considered to be a significant obstacle for changes in cultivating method when the farmers are getting older, and they are likely to employ common approaches of cultivation (Fenton et al., 2000). However, they gained more experience in farming (Anosike & Coughenour, 1990). Age of farmers plays a fundamental role in the decision of agricultural development. It is old farmers that have more experience in farming, and they are less open to taking risks than inexperienced farmers. From this point, H1 and H2 hypotheses are proposed as follows H1: Age of labor force directly impacts the decision of developing agricultural commodity trend, H2: Experience of labor force affects the determination of development of agricultural commodity trend.

Levels of education of the labor force directly impact the decision of developing agricultural commodity trend

According to Yang (2004), Foster and Rosenzweig (1996), Pitt and Sumodininggrat (1991), levels of education is a crucial factor affecting progress. Low levels of education will be a barrier to access to advanced technology. Additionally, it is likely to influence farmers' decision of development trend. Therefore, the farmers with low levels of education tend to be afraid of taking risks not open to apply advanced technology (Mc Cann, 1997; Musshoff & Hirschauer, 2008; Serra et al., 2008). Furthermore, lacking knowledge and information about the benefits of modern technology are likely to affect farmers' decision of agricultural development trend (Chavas et al., 2010). From this view, the third hypothesis is suggested H3: Levels of education of the labor force directly impacts the decision of developing agricultural commodity trend.

Agricultural land impacts the decision of developing agricultural commodity trend.

The land is an indispensable asset of farming households and is also a decisive factor in agricultural development. Moreover, the land is one of the driving forces of the transformation of the farming economy in commodity production trend (Pham, 2008). According to Rehima et al. (2013), agricultural land positively impacts changes in the cultivation methods of farmers. Phimmasone and Ngoan believe agricultural land is a negative factor in the decision of developing agricultural commodity trend (2015). Nevertheless, another research of Pope and Prescott points out households possess a large percentage of land area are likely to expand the scale of farming (1980). Therefore, this paper proposed the fourth hypothesis H4: Agricultural land directly impacts the decision of developing agricultural commodity trend.

The capital of production directly impacts the decision of developing agricultural commodity trend

Money is a significantly vital factor which promotes the process of expansion scale of production. Truong and Tran's study shows that the capital shortage in investment results in reduced yield and the decrease in households' income (2008). Besides, Trieu (2009) proves that capital affects the development of agricultural commodity trend intensively. For this reason, the fifth hypothesis was proposed in this current paper H5: The capital of production directly impacts the decision of developing agricultural commodity trend.

Technical training impacts the decision of developing agricultural commodity trend

Technical training is a popular form which helps farmers access and applies advanced technology into their cultivation process. According to Rehima et al. (2013), the opportunities for accessing agricultural stimulation service and joining technical training will bring positive effects on the farmers' decision of cultivation methods. With a similar view, Bernardo and Charles (2014) stress the significance of advanced technology's knowledge those farmers have learned will promote farming restructuring. For this reason, the sixth hypothesis was suggested H6: Technical training impacts the decision of developing agricultural commodity trend.

Natural factors influence the decision of developing agricultural commodity trend

In agricultural production, natural elements such as water sources, soil fertility, risks of floods, droughts have a vital role to play in the birth and growth of various plants (Loomis et al., 1971; Leemans and Sinh, 1994). In the research of Benin et al. (2004), Rehima et al. (2013) have pointed out that the closest distance to approach

to a market affects the level of diversity in production. According to Nguyen (2011), the advantages of geographic location, natural resources, weather are essential and significant factors that directly impact the formation and restructuring of the agricultural economy. Trieu's study (2009) shows that physical conditions are essential to agricultural commodity development. To support this point, Le (2016) indicates factors such as soil, water sources, geographical location affect agricultural restructuring. From this point, the additional hypotheses were suggested in this research H7: Geographic location of production area influences the decision of developing agricultural commodity trend; H8: Soil features influence the choice of developing agricultural commodity trend; H9: Water sources influence the decision of developing agricultural commodity trend.

Local policies influence the decision of developing agricultural commodity trend

Local policies and principles might impact the potentials of making benefit and developing agriculture. In this way, those policies could bring pros and cons to the formation and households' decision of farming restructuring (Hardie et al., 2004). Le (2016) shows that local factors including the capability of deployment, guideline application, strategies, and policies of the government and Communist Party of Vietnam in various hierarchies of local authorities will affect the process of agricultural economy restructuring. According to Nguyen (2012), the process of agrarian economy restructuring is influenced by different factors. Particularly, policy mechanism is a very significant factor which determines the transformation trend. Therefore, the tenth hypothesis was proposed H10: Local policies influence the decision of developing agricultural commodity trend.

Output markets influence the decision of developing agricultural commodity trend

Output markets is always a big concern of farmers. The majority of previous research indicates that access to output markets positively affects the development of the agricultural commodity trend (Rehima et al., 2013). According to Bowman and Zilberman (2013), the demands of output markets comprise price, price changes, transportation fee, transaction fee. The components mentioned above are significantly influential to the methods of cultivation.

Additionally, Nguyen (2012) believes supply and demand in markets have a great impact on the restructuring of the agricultural economy. Furthermore, Trieu's point of view is that the market is a crucial element to determine the scale and speed of farm commodity development (2009). Also, Phimmasone and Ngoan (2015) state that consumer markets have a positive influence on the transformation of agriculture into the agricultural commodity. Therefore, the current paper suggested the eleventh hypothesis H11: Output markets positively influence the decision of developing agricultural commodity trend.

Infrastructure positively influences the decision of developing agricultural commodity trend

Rural infrastructure plays a vital role in the strategies of the agricultural progress of the local areas in general and the cultivation methods of households in particular. According to Do (1996), poor infrastructure is an obstacle to the transformation of an economic structure. The development of rural infrastructure is the critical factor that stimulates the process of diversification in plant farming and the change of agricultural cultivation methods (Rahman, 2008). For this reason, the twelfth hypothesis is recommended H12: Infrastructure influences the decision of developing agricultural commodity trend.

Based on the theoretical background and the literature review, this paper suggests a research framework of factors affecting the households' decision of agricultural commodity development when they are planting in Chau Thanh A, Hau Giang province following:
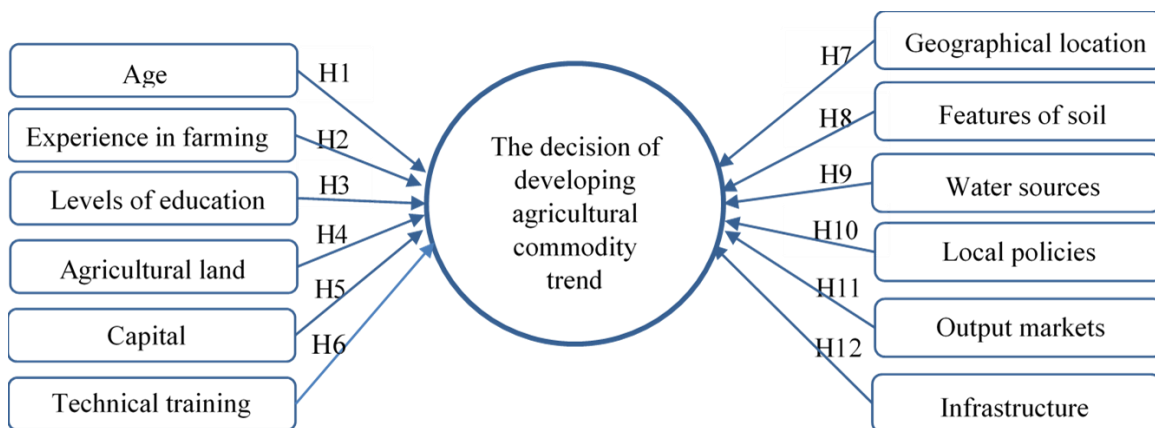

Figure 1: A proposed research framework

Table 1: The interpretation of variables in the research model

Concepts	Sign	Interpretation of variables	Scale	References
Age	AG	Age of agricultural farmers	Quantity (year)	Fenton et al. (2000) Anosike & Coughenour (1990).
Experience	EX	Years of joining plant farming	Quantity (year)	Fenton et al. (2000), Anosike & Coughenour (1990)
Levels of education	LE	Years of joining schools	Quantity (year)	Mc Cann (1997), Musshoff & Hirschauer (2008), Serra et al. (2008), Chavas et al. (2010)
Technical training	TT	Participation of farmers in the training of advanced technology application into production, value 1 if yes, value 0 if no	Dummy (1/0)	Rehima et al. (2013), Bernardo & Charles (2014)
Agricultural land	AL	The total area of farming land of households	Quantity (m2)	Rehima et al (2013), Pham (2008), Phimmasone & Ngoan (2015), Pope & Prescott (1980)
Capital	CA	The total capital of farming investment of households	Quantity (million VND)	Trieu (2009), Truong & Tran (2008)
Geographical Location	GL1	The distance between manufacturing location and consumption location/produce markets	Likert 1-5	Benin et al. (2004), Rehima et al. (2013), Nguyen (2011), Le (2016).
	GL2	The distance between the manufacturing location and main highways	Likert 1-5	
	GL3	Near distance between manufacturing location and main rivers	Likert 1-5	
	GL4	Near distance between manufacturing location and supply location/ input service	Likert 1-5	
Features of soil	FS1	Farming soil suits the growth condition of plants	Likert 1-5	Loomis et al. (1971), Leemans (1994), Le (2016).
	FS2	The farming soil is flexible for changing various types of plants	Likert 1-5	
	FS3	The scale of total farming land is convenient for changing various types of plants	Likert 1-5	
Water sources	WS1	Water supply is adequate for growing and cultivating plants	Likert 1-5	Loomis et al. (1971), Leemans & Sinh (1994), Le (2016).
	WS2	Water quality is suitable for changing different plants	Likert 1-5	
	WS3	The amount of rainwater is suitable for changing different plants	Likert 1-5	
Local policies	LP1	Authorities support farmers to improve their cultivation techniques	Likert 1-5	Hardie et al. (2004); Le (2016); Nguyen (2012).
	LP2	Authorities advocate agricultural commodity production	Likert 1-5	
	LP3	Authorities support farmers to consume produces	Likert 1-5	
	LP4	Authorities assist farmers in accessing the production capital	Likert 1-5	
Output markets	OM1	Output markets of produces are quite convenient for selling	Likert 1-5	Rehima et al (2013); Bowman & Zilberman (2013); Nguyen (2012); Trieu (2009), Phimmasone & Ngoan (2015).
	OM2	Households can choose customers	Likert 1-5	
	OM3	Households are able to choose the time to sell produces	Likert 1-5	
	OM4	The price of produces is always sustainable	Likert 1-5	
Infrastructure	IN1	Traffic system is convenient for agricultural farming materials' transportation	Likert 1-5	Rahman (2008); Do (1996).
	IN2	Electricity source is adequate to agricultural manufacture activities	Likert 1-5	
	IN3	It is easy to access to buying produce spots	Likert 1-5	
	IN4	The irrigation system is well-supported for the agricultural manufacture	Likert 1-5	
	IN5	Information and communication systems are well-equipped	Likert 1-5	
Decision	DE	The decision of developing agricultural commodity trend, value 1 if yes, value 0 if no, and vice versa	Dummy (1/0)	Recommendations from the researcher

Source: The generalization of the researcher, 2017

2.2 Data and analysis methodology

In this study, analysis methods were employed in the following process: (1) Cronbach's Alpha used to test the reliability of the five-point Likert scale of observed variables, (2) Analysis of EFA (Exploratory Factor Analysis) in the five-point Likert scale of observed variables, (3) A binary logistic analysis was applied to test the research hypotheses. Also, a quota method was used to collect data. According to the studies of Green (1991), Tabachnick and Fidell (1996), the minimum of sample size in regression analysis was calculated by a formula: 50 + 80m (m: independent variables). The research framework was formed with 12 independent variables, which means there need to be at least 146 observations. 150 face-to-face interviews gathered the data of this study, and interviewees were mango, orange, and rice farmers in Chau Thanh A district, Hau Giang province. Orange, mango, and rice are the primary product of Chau Thanh A district. The survey locations were focused on Tan Hoa, Thanh Xuan, Nhon Nghia A, Truong Long A, Truong Long Tay communes and Bay Ngan commune. Research data was valid for representatives and the reliability in the research's analysis methodology.

III. RESEARCH RESULTS AND DISCUSSION

3.1 Reliability assessment of five-point Likert scales

This study aims at identifying influential factors in the households' decision of agricultural commodity development in Chau Thanh A. Furthermore, the paper employed the reliability of Cronbach's Alpha to measure the correlation and fitness among observed variables in five-point Likert scale. The measurement results of table 2 showed that all of the Cronbach's Alpha values of observed variables were higher than 0.6 (the minimum value was 0.695 and the maximum value was 0.915, and all of the item-total correlation values of those variables were higher than 0.3. For this reason, not any variable in this research was removed (Nunnally, 1978; Peterson, 1994; Slater, 1995). As a result, all observed variables were valid and used for subsequent exploratory factor analysis.

Table 2: The result in the assessment of Likert scale's reliability

Factors	Number of variables	Min Item-total correlation	Cronbach's Alpha
Geographical location	4	0.609	0.844
Features of soil	3	0.622	0.790
Water sources	3	0.489	0.695
Local policies	4	0.624	0.863
Output markets	4	0.724	0.903
Infrastructure	5	0.708	0.915

Source: Survey Data, 2017

3.2 Exploratory factor analysis (EFA)

With all observed variables measured with five-point scales, this study moves on exploratory factor analysis (EFA) step in order to measure the convergence and distinct values of the observed variables. The result of exploratory factor analysis (EFA), Principal Components and Varimax method to maintain the values as follows: (1) The reliability of observed variables (Factor loading > 0.5); (2) The suitability of the research model ($0.5 < KMO = 0.791 < 1$); (3) Bartlett's test of the correlation between observed variables (Sig. = 0.000 < 0.05); (4) Testing cumulative of variance = 73.5%. (> 50%). From this point, there were five factors formed from 23 observed variables, and there were no changes among observed variables; therefore, their names were unchanged.

Table 1: Factors formed from the exploratory factor analysis (EFA)

Abbrev.	Observed Variables	Names of Factors
GL	4 variables: GL1, GL2, GL3, GL4	Geographical location
FS	3 variables: FS1, FS2, FS3	Features of soil
WS	3 variables: WS1, WS2, WS3	Water sources
LP	4 variables: LP1, LP2, LP3, LP4	Local policies
OM	4 variables: OM1, OM2, OM3, OM4	Output markets
IN	5 variables: IN1, IN2, IN3, IN4, IN5	Infrastructure

Source: Survey Data, 2017

3.3 Binary logistic analysis

From the results in exploratory factor analysis, the proposed research model remained unchanged. Proposed influential factors in the decision of developing agricultural commodity trend include age, experience, levels of education, agricultural land, capital, output markets, infrastructure. The result in the binary logistic analysis was demonstrated following: (1) the research model was statistically meaningful with the value of Sig. = 0.00; (2) The predictability of the research model was highly accurate with 96%. (3) The Wald assessment of those factors showed that nine variables were statistically meaningful, which means that nine factors were affecting the

households' decision of agricultural commodity trend in Chau Thanh A commune, Hau Giang province. The specific result is presented in Table 4.

Table 4: The result in binary logistic analysis

Factors	B	Sig.	Exp(B)
Age	0.061	0.210	1.063
Levels of education	0.396	0.030	1.485
Experience	0.034	0.559	1.035
Agricultural land	0.098	0.210	1.103
Capital	0.056	0.029	1.057
Technical training	2.552	0.018	12.835
Infrastructure	1.007	0.015	2.736
Output markets	0.852	0.072	2.344
Local policies	0.221	0.599	1.248
Geographical location	1.894	0.004	6.644
Features of soil	1.328	0.038	3.775
Water sources	1.582	0.022	4.863
Constant	-31.751	0.000	0.000

Source: Survey Data, 2017

The result in Table 4 indicated that nine influential factors in the decision of developing agricultural commodity trend include levels of education, agricultural land, capital, technical training, infrastructure, output markets, geographical location, features of soil, and water sources. All of the mentioned factors were paralleling to the decision of developing agricultural commodity trend. This proves three implications:

First, if farmers have great sources such as high levels of education, a large amount of agricultural land, and a sustainable capital for production; they are likely to develop agricultural commodity trend more and more. Undeniably, the inside sources have a significant influence on the methods of cultivation of farmers. Particularly, levels of education of farmers play the most significant role in the decision of developing agricultural commodity trend. The finding of this study was in line with research of Mc Cann (1997), Musshoff and Hirschauer (2008), Serra et al. (2008), Chavas et al. (2010).

Second, natural factors including geographical location, features of soil, and water sources have a positive impact on the decision of developing agricultural commodity trend. In particular, a geographic area is the most influential element to the determination of developing agricultural commodity trend. The outcome of this paper shared the same view with Benin et al. (2004), Rehima et al. (2013), Nguyen (2011), Le (2016).

Third, factors related to social and economic conditions such as technical training, infrastructure, output markets positively affect the decision of developing agricultural commodity trend. The finding of this research was similar to studies of Rehima et al. (2013), Bernardo and Charles (2014).

IV. CONCLUSION

In general, the study reaches it raised purpose when identifying influential factors in the households' decision of developing agricultural commodity trend in Chau Thanh A district, Hau Giang province. The outcomes of this current paper prove that nine factors affecting the households' decision of agricultural commodity trend consisted of levels of education, agricultural land, capital, technical training, infrastructure, output markets, geographical location, water sources, and features of soil. Particularly, technical training is the most powerful component that influences the households' decision of developing agricultural commodity trend in Chau Thanh A district, Hau Giang province. This is a fundamental scientific background for authorities to promote local agricultural commodity trend and meet the demand for integration and development.

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