RECOMMENDATIONS DEVELOPING THE SUSTAINABLE FOOD VALUE CHAIN OF THE AGRICULTURAL SECTOR IN DONG NAI PROVINCE

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ABSTRACT: *Vietnam's economy is increasingly integrated into the international economy. The key economic sectors in which agriculture is assessed will have many favorable opportunities for development. However, in order not to fall behind, the agricultural sector must rapidly develop the value chain. Moreover, the "4 houses" link in modern agricultural production is claimed to be the best one at present. The most important issue: what farmers produce, where to sell, how the price is the only satisfactory answer when there is clarification of roles and responsibilities of each house in the linkage. The role of "role play" is also intended to promote the overall strength of the link. There are 4 main factors: Government (State), Scientist, Enterprises and Farmer are the four main factors of linkages in agricultural production. In particular, the State is "the leader", the engine of the link. Enterprises play the important role to link the remaining "4 houses" to form the raw material production area; Input support and product procurement for farmers; step by step to build brand name of agricultural products. The study results showed that there were 400 persons who include: 200 managers of enterprises, 170 farmers, 30 experts related to agricultural sector in Dong Nai province who interviewed and answered about 17 questions. The Data collected from June 2016 to April 2017. This study had been analyzed Cronbach's Alpha testing, KMO testing and the result of KMO testing used for the multiple regression. Persons' responses measured through an adapted questionnaire on a 5-point Likert scale. The Data processed by SPSS 20.0. In addition, four components affecting the sustainable food value chain development with significance level 5 percent and then the researchers have recommendations developing the sustainable food value chain of the agricultural sector in Dong Nai province.*

KEYWORDS: Food, Farmer, Value Chain, Development and LHU

INTRODUCTION

Vietnam's agriculture is still largely fragmented, with repeated refusals. There are the loose linkages, especially the linkages between enterprises and farmers, to create large commodity agricultural chains that are limited. The key role of the State in the value chain is still very weak. It is these factors that make Vietnamese agriculture vulnerable and less competitive. In this context, the value chain is extremely important in agricultural production and if we do not successfully build the value chain it will be difficult to compete, capable of bringing domestic products to the national market.

In addition, the number of enterprises operating in the agricultural sector of our country is very small, accounting for only 1% of the total number of enterprises. Most of them are mainly involved in the collection, processing and marketing, with little investment in agriculture, especially production. Meanwhile, the management role of the State is to develop

a sustainable agricultural value chain, it is important to associate with enterprises in the production process. Besides, we have to build to link the value chain, the application of science and technology to agricultural production with key players acting as the main actor has been proven to be a suitable model for modern agricultural production. In this value chain, the enterprises will be in control of better product quality. When planning product areas, enterprises and farmers will be more convenient when applying science and technology on a large scale, helping to increase product value and improve profitability. Due to the close linkages in each stage of production, the value chain not only brings great economic benefits but also contributes to ensuring food safety and hygiene. The above mentioned things, the researchers had chosen topic **"*Recommendations developing the sustainable food value chain of the agricultural sector in Dong Nai province*"** as a paper for finding out key factors affecting the sustainable food value chain development and have recommendations developing the sustainable food value chain of the agricultural sector not only in Dong Nai province but also other provinces of Vietnam.

LITERATURE REVIEW

The sustainable food value chain development (SFVCD): The Food and Agriculture Organization of the United Nations (FAO, 2014) showed that The SFVCD paradigm starts from the premise that food insecurity is a symptom of poverty. If households always have sufficient financial resources (income, wealth and support) to meet their needs, they create the effective demand that drives the supply of food. On the supply side, improvements in the food system driven by competition can reduce the cost of food to the consumer or increase its nutritional value without increasing its price.

The SFVCD reducing the cost of food will have a strong effect on poverty when food accounts for a large portion of household expenditure for a large part of the population, as is the case in most developing countries. Addressing hunger sustainably and in the long term thus implies addressing both an underperforming economic system and an underperforming food system. SFVCD plays a central role in this process, but needs to be accompanied by the development of sustainable non-food value chain (VCs) and by programs that improve the enabling environment, facilitate self-employment and strengthen social protection. According to the Food and Agriculture Organization of the United Nations (FAO, 2014).

Government: Jacoby, David (2009) studied "Guide to Supply Chain Management: How Getting it Right Boosts Corporate Performance". A government had many policy statements that are a declaration of a government's political activities, plans and intentions relating to a concrete cause or, at the assumption of office, an entire legislative session. In certain countries they are announced by the head of government or a minister of the parliament.

Enterprises: Kaplinsky R. (2000) studied "Spreading the gains from globalization: what can be learned from value market chain analysis". Enterprises develop and use business information systems to satisfy their information needs. The information needs of a busi-ness enterprise are determined primarily by (a) the nature of busi-ness functions or activities, and (b) the process of managerial deci-sion making followed by the business managers.

It is, thus, impera-tive to understand the information needs of business with regard to various business functions or activities and the process of mana-gerial decision making in vogue, in a

given enterprise. The business functions or activities and managerial decision making process vary from one enterprise to another, so would the information need.

The functions of a typical business enterprise can be broadly clas-sified into the following categories: (1). Marketing function; (2). Finance function; (3). Production function; (4). Human Resources Management function and (5). Information function.

Information needs of a business enterprise can, thus, be identified under these broad functional areas. However, at the very outset it is essential to point out that the present market realities suggest that the focus of all business functions should be the customer. Each of the functions of business should, there-fore, aim at goals such as reducing costs, streamlining processes, maintaining good relations with customers, reducing cycle times, maintaining high degree of quality control, customizing products and services, catering to niche markets, etc.

For attaining these goals a manager needs information, services and networks that would enable him to focus on customers. Most important of such informa-tion, services and networks are discussed below with special refer-ence to each of the functions of business.

Scientist: De Silva D.A.M. (2011) studied "Value chain of fish and fishery products: origin, functions and application in developed and developing country markets". Scientist is a person engaging in a systematic activity to acquire knowledge. In a more restricted sense, a scientist may refer to an individual who uses the scientific method. The person may be an expert in one or more areas of science. This article focuses on the more restricted use of the word. Scientists perform research toward a more comprehensive understanding of nature, including physical, mathematical and social realms.

Philosophy is a distinct activity that is not generally considered science philosophers aim to provide a comprehensive understanding of intangible aspects of reality and experience that cannot be physically measured.

Scientists are also distinct from engineers, those who design, build, and maintain devices for particular situations; however, no engineer attains that title without significant study of science and the scientific method. When science is done with a goal toward practical utility, it is called applied science. An applied scientist may not be designing something in particular, but rather is conducting research with the aim of developing new technologies and practical methods. When science is done with an inclusion of intangible aspects of reality it is called natural philosophy. Science and technology have continually modified human existence through the engineering process. As a profession the scientist of today is widely recognized. Scientists include theoreticians who mainly develop new models to explain existing data and predict new results, and experimentalists who mainly test models by making measurements though in practice the division between these activities is not clear-cut, and many scientists perform both tasks.

Farmer: Angel Gurría (2012) studied "The Emergence of Global Value Chains: What Do They Mean for Business". Farmer (also called agriculture) is a person engaged in agriculture, raising living organisms for food or raw materials. The term usually applies to people who do some combination of raising field crops, orchards, vineyards, poultry, or other livestock. A farmer might own the farmed land or might work as a laborer on land owned by others, but in advanced economies, a farmer is usually a farm owner, while employees of the farm known as farm workers, or farmhands. However, in the not so distant past a farmer was a person who

promotes or improves the growth of (a plant, crop, etc.) by labor and attention, land or crops or raises animals (as livestock or fish).

In the context of developing nations or other pre-industrial cultures, most persons practice meager subsistence agriculture a simple organic farming system employing crop rotation, seed saving, slash and burn, or other techniques to maximize efficiency while meeting the needs of the household or community. Historically, there is one subsisting in this way known as a peasant. In developed nations, however, a person using such techniques on small patches of land called a gardener and be considered a hobbyist. Alternatively, one driven into such practices by poverty or, ironically against the background of large-scale agribusiness might become an organic farmer growing for discerning consumers in the local food market.

METHODS OF RESEARCH

Research processing for the various factors affecting sustainable food value chain development

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│                 Literature review                 │
│   Theory of sustainable food value chain development   │
│  Factors affecting sustainable food value chain development  │
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│                  Research model                   │
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│          Data analysis (descriptive statistics)          │
│         Assessment scale (reliability, high value)         │
│                  Adjustment model                 │
│          Factor analysis & linear regression analysis          │
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            ⬭ Conclusion & Recommendations ⬭
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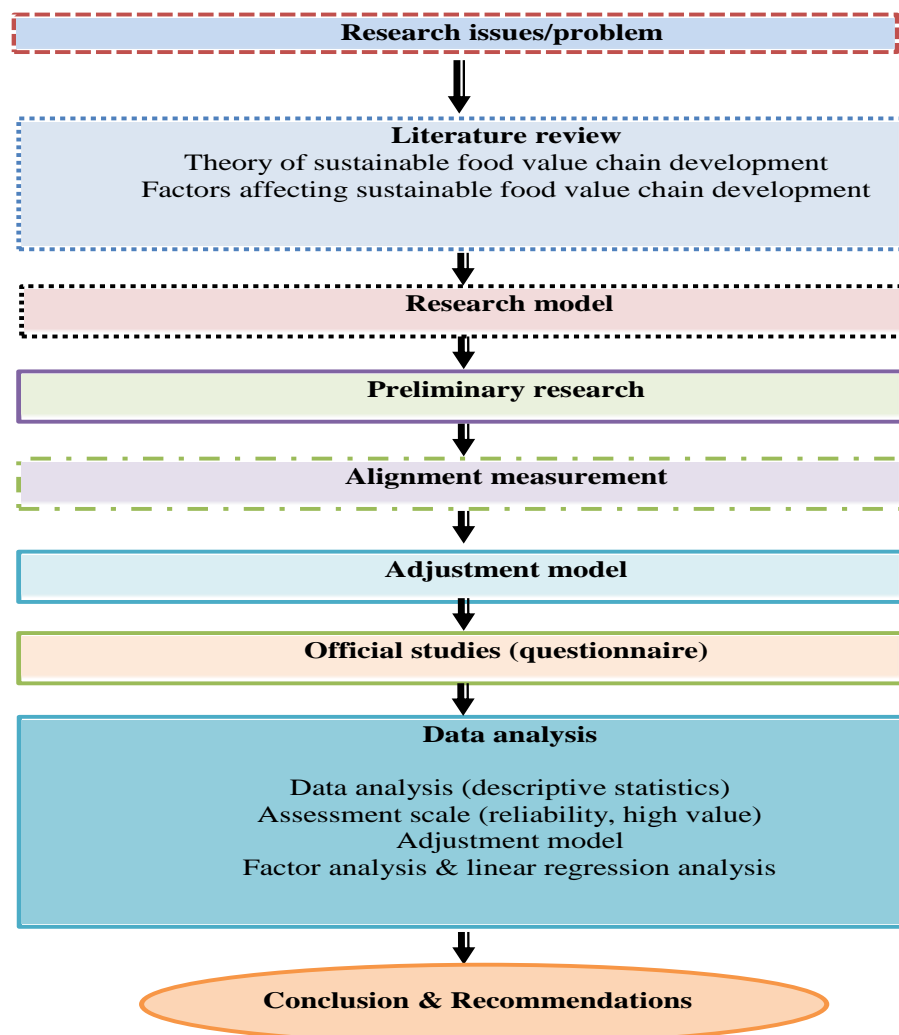
Figure 1: Research processing for the factors affecting the sustainable food value chain development

After preliminary investigations, formal research is done by using quantitative methods questionnaire survey of 400 persons (include: 200 managers of enterprises, 170 farmers, 30 experts) related to agricultural sector in Dong Nai province who interviewed and answered about 17 questions. The Data collected from June 2016 to April 2017. The reason tested measurement models, model and test research hypotheses. Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60), factor analysis explored (remove the variable low load factor < 0.50). The hypothesis was tested through multiple regression analysis with linear Enter method. Conventions: 1: Completely disagree, 2: Disagree, 3: Normal; 4: Agree; 5: completely agree. Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60), factor analysis explored (remove the variable low load factor < 0.50).

The data collected by the researcher and be analyzed by SPSS 20.0. Before having analyzed, the data screened to delete outliners to secure reliability. Creative research systems offers complete data processing services. I provide presentation-quality tables, text reports and graphics. In addition to or instead of paper copies, the researcher can provide the tables, reports and graphics on disk, ready for you to incorporate into a document or research presentation. the researcher can enter data from paper questionnaires or use a data file you provide. Most interviewing, scanning and database packages can produce a data file we can use. If you use the survey system, interviewing and tabulation software, the researcher can provide instruction files you can use for further analysis. The basis for conceptualizing of the fresh food chain is in processes as a source material. The conceptual framework of the study is spelled out in the **Input** - **Process** - **Output** model reflected in figure 2.
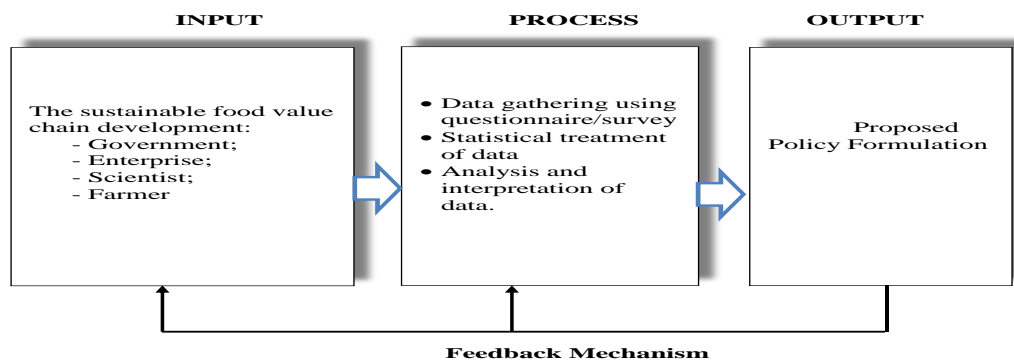

Figure 2: Framework for the sustainable food value chain development

The **Input** consists of the fresh food chain: Government; Enterprise; Scientist and Farmer.

The **Process** consists of data gathering using survey questionnaire the statistical treatment of data, and the analysis and interpretation of data. The **Output** was the proposed policy formulation.
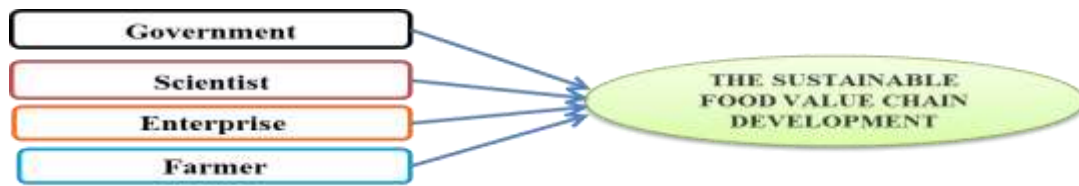
Figure 3: Proposed research model for the various factors affecting the sustainable food value chain development

Figure 3 showed that the sustainable food value chain development is the dependent variable but we had four various factors: Government; Scientist; Enterprise and Farmer that are independent variables. There are positive relationship between four above mentioned factors and the sustainable food value chain development.

RESEARCH RESULTS

Table 1: Descriptive Statistics and Cronbach's Alpha for factors affecting the sustainable food value chain development

1. GOVERNMENT (GOV)	N	Min	Max	Mean	S.D
GOV1: Vietnam Government has been planning the development policy of the food value chain into a commodity industry with prestigious brands	388	1.00	5.00	2.9588	.88242
GOV2: Vietnam Government has been planning the development policy for labor structure along with the process of industrialization and modernization for the food value chain	388	1.00	5.00	2.5670	1.54624
GOV3: Vietnam Government has been planning the development policy to create linkages between persons and benefit businesses for the food value chain	388	1.00	5.00	2.8582	1.47433
GOV4: Vietnam Government has been planning the development policy towards quality and sustainability for food value chain and supply market information	388	2.00	5.00	3.2912	1.28205
Cronbach's Alpha is 0.758					
2. ENTERPRISE (ENT)	**N**	**Min**	**Max**	**Mean**	**S.D**
ENT1: Enterprise has been investing financial factor for modern production technology and capital investment for the processing	388	1.00	5.00	2.9356	.85270
ENT2: Enterprise has been building organizational models and associated manufacturing production consumes large scale and capital investment and technical factors cultivated technology	388	1.00	5.00	2.8686	.77809
ENT3: Enterprise has been increasing the competitiveness of enterprises in the process of integration; reduced costs are incurred for business by cooperating with suppliers.	388	1.00	5.00	2.7216	.87742
Cronbach's Alpha is 0.782					

3. SCIENTIST (SCI)	N	Min	Max	Mean	S.D
SCI1: Scientist has been researched the element manage of quality food varieties in order to meet the market demand	388	1.00	5.00	3.1340	.91926
SCI2: Scientist has been researched the tight control element for food disease, input varieties and materials.	388	1.00	5.00	3.3247	.96593
SCI3: Scientist has been researched the elements of cultivation protection products for new inputs and new product model	388	1.00	5.00	3.3814	.89723
SCI4: Scientist has been researched the cultivation techniques for farmers' knowledge level and scientific research activities to create new food varieties with high productiveness and good quality	388	1.00	5.00	3.3119	.91395
Cronbach's Alpha is 0.872					
4. FARMER (FAR)	N	Min	Max	Mean	S.D
FAR1: Farmer applied the modern product system for the sustainable food value chain and doing business by contract and linkage; respect the contract in terms of quantity, quality of product and time of supply.	388	1.00	5.00	2.9768	1.40025

Table 1: continued

	N	Min	Max	Mean	S.D
FAR2: Farmer applied the new technology for the sustainable food value chain and farmers need to understand and improve their rights and responsibilities in the implementation of economic contracts	388	1.00	5.00	2.9639	1.04609
FAR3: Farmer applied the new cultivated systems for the sustainable food value chain and improve the knowledge of market information forecast	388	1.00	5.00	3.1881	1.26089
Cronbach's Alpha is 0.731					
5. SUSTAINABLE FOOD VALUE CHAIN DEVELOPMENT (SFVCD)	N	Min	Max	Mean	S.D
SFVCD1: Food value chains address the competitive need for responsiveness to and knowledge of the target customer and Enterprises' profits rose.	388	2.00	5.00	3.3454	.65832
SFVCD2: Food value chain is a strategic business model engaging all participants in the supply chain in mission and operational shared values; Persons increase income and benefit from the fresh food chain.	388	2.00	5.00	3.2552	.74317
SFVCD3: Communicating shared values to customers differentiates products, expand market share, and builds loyalty; Consumers' benefits is from the fresh food chain.	388	1.00	5.00	3.3376	.73448
Cronbach's Alpha is 0.682					

(Source: The researchers' collecting data and SPSS)

Table 1 showed that there were 388 samples processed and answered about 17 questions and 12 samples lack of information. Data collected from June 2016 to April 2017. Mean value is around 3.00; and Std. Deviation (S.D) is around 1.00. All of Cronbach's Alpha test is high 6.0; This showed that data was suitable and reliability for researching.

Table 2: KMO and Bartlett's Test for factors affecting the sustainable food value chain development

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.773
Bartlett's Test of Sphericity	Approx. Chi-Square	2091.482
	df	91
	Sig.	.000

Total Variance Explained

Com.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.458	24.698	24.698	3.458	24.698	24.698	2.909
2	2.910	20.783	45.481	2.910	20.783	45.481	3.023
3	2.017	14.404	59.885	2.017	14.404	59.885	2.273
4	1.167	8.335	68.220	1.167	8.335	68.220	2.512
5	.777	5.547	73.767				
…	…	…	…				
14	.276	1.974	100.000				

(Source: The researchers' collecting data and SPSS)

Table 2 showed that Kaiser-Meyer-Olkin Measure of Sampling Adequacy was statistically significant and high data reliability (KMO = 0.773 > 0.6). This result was very good for data analysis. Table 2 showed that Cumulative percent was statistically significant and high data reliability was 68.220 % (> 60 %). There are 14 items for the factors that affecting the sustainable food value chain development.

Table 3: Structure Matrix for factors affecting the sustainable food value chain development

Code	Component			
	X1	X2	X3	X4
SCI2	.868			
SCI1	.852			
SCI3	.849			
SCI4	.830			
GOV2		.852		
GOV3		.814		
GOV4		.763		

GOV1		.620		
ENT2			.883	
ENT3			.847	
ENT1			.787	
FAR3				.938
FAR2				.827
FAR1				.563

(Source: The researchers' collecting data and SPSS)

Table 3 showed that Structure Matrix had four Components. Component 1 was "**Scientist**" (X1), Component 2 was "**Government**" (X2), Component 3 was "**Enterprise**" (X3) and Component 4 is "**Farmer**" (X4). There are four factors that affecting the sustainable food value chain development. Four factors include: X1, X2, X3 and X4 are independent variables.

Table 4: KMO and Bartlett's Test for the sustainable food value chain development

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.630
Bartlett's Test of Sphericity	Approx. Chi-Square	198.932
	df	3
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.835	61.168	61.168	1.835	61.168	61.168
2	.701	23.382	84.550			
3	.463	15.450	100.000			

(Source: The researchers' collecting data and SPSS)

Table 4 showed that the KMO and Bartlett's Test was statistically significant and high data reliability (KMO = 0.630 > 0.6); total of Initial Eigenvalues is 1.835 (> 1.0). Besides, the sustainable food value chain development showed that cumulative percent was statistically significant and high data reliability was 61.168 % (> 60 %). The result was very good for data analysis. Y: the sustainable food value chain development. Y is dependent variable.

Table 5: Factors affecting the sustainable food value chain development

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.795[a]	.632	.628	.34011	1.587

a. Predictors: (Constant), X4, X1, X3, X2
b. Dependent Variable: Y

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	75.975	4	18.994	164.197	.000[b]
Residual	44.304	383	.116		
Total	120.279	387			

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.632	.126		5.010	.000		
X1	.323	.022	.455	14.600	.000	.992	1.008
X2	.192	.020	.347	9.619	.000	.739	1.353
X3	.124	.025	.155	4.936	.000	.971	1.030
X4	.232	.020	.418	11.711	.000	.756	1.323

Bootstrap for Coefficients

Model	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
(Constant)	.632	-.006	.100	.001	.438	.824
X1	.323	.001	.023	.001	.278	.369
X2	.192	.000	.019	.001	.155	.231
X3	.124	-.001	.022	.001	.079	.165
X4	.232	.001	.020	.001	.196	.272

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

(Source: The researchers' collecting data and SPSS)

Table 5 showed that Adjusted R Square is 0.628. It was statistically significant and high data reliability. In addition, Adjusted R Square reached 62.8 %. The results showed that all t value > 2 (Sig < 0.05) was statistically significant and high data reliability. Besides, the regression coefficients were positive.
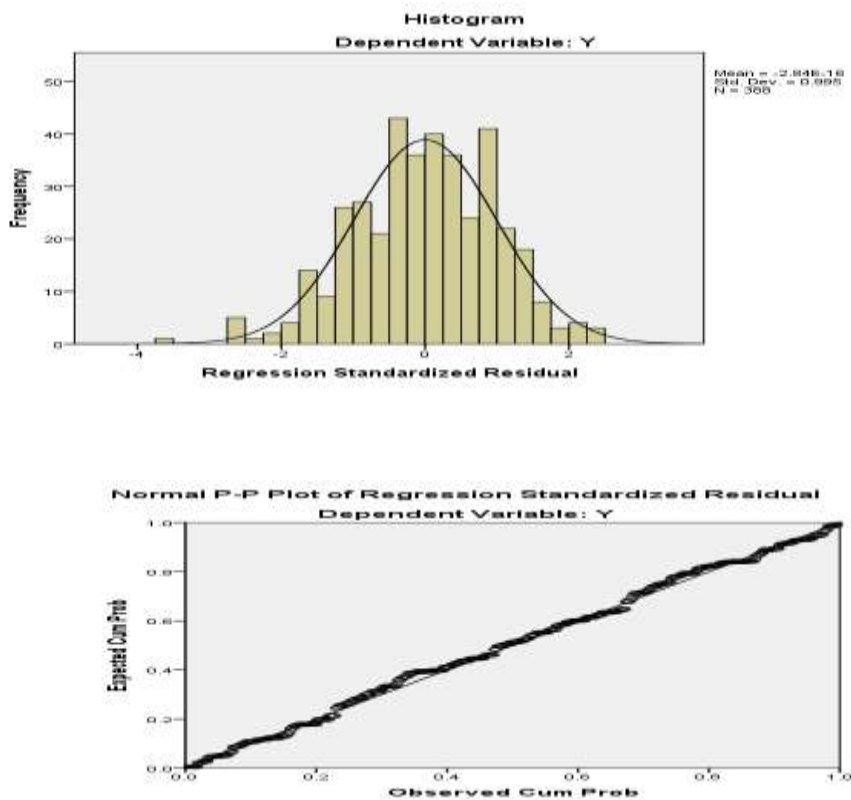
Figure 4: Normal P-P Plot of Regression Standardized Residual

Multicollinearity (MC): Variance Inflation Factor (VIF) and Tolerance are two measures that can guide a researcher in identifying MC. VIF < 10 (1 < VIF < 10). This showed that there was not Multicollinearity. Four factors affecting the sustainable food value chain development with significance level of five percent. Besides, F = 164.197, sig = 0.00. Standard deviation is 0.995, around 1.00. Besides, bootstrap results are based on 1000 bootstrap samples, bias is around 0.00. So, this model is very good for policies improving the sustainable food value chain development.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In recent years, Vietnam's agriculture has gained encouraging results with relatively high annual growth rate, with an average growth of 5.4% in production value and 3.7% of value added. Vietnam maintains its position as a major exporter of agricultural products with an export turnover of nearly $ 31 billion. Vietnam's agriculture continues to build and develop a modern and sustainable agriculture that is competitive enough for integration, ensuring food security and improving the living standards of farmers is to determine the agricultural and rural development objectives. In the context of globalization and international economic integration, Vietnam's agriculture has many favorable opportunities for development, but also faces many challenges, sustainable agricultural development; with the construction and developing models of agricultural production in the value chain is the right direction. The study results

showed that there were four factors that affecting the sustainable food value chain development with significance level 5 percent. Four factors included: Component 1 was "Scientist" (X1), Component 2 was "Government" (X2), Component 3 was "Enterprise" (X3) and Component 4 is "Farmer" (X4).

Recommendations

The researchers suggest that the "**State**" clearly demonstrates its role in the "four houses" through the promulgation of policies to encourage the development of food value chains, to ensure the harmonious interests of the stakeholders. The development of food value chains are participating from production, processing to consumption. Besides, the "**Scientist**" continues to make a breakthrough in agriculture, it is necessary to strengthen research, transfer and application of scientific and technological advances, application of high technologies and advanced scientific and technological solutions. **Scientist** continues developing a model with each sector for replication; encourage the linkage between state-owned science organizations and enterprises. The **State** needs to increase investment in applied research in agriculture, especially biotechnology, information technology in production, and agricultural management. Besides the **State** budget, there should be more policies to encourage businesses and individuals to invest in agriculture, especially hi-tech agriculture, in order to modernize agriculture, improving quality and creating added value for Vietnamese food products.

However, in order to apply science and technology to food production, "**Enterprises**" continue to invest large scale production is required. "Enterprises" have only large-scale production under the value chain model, with strong linkages between farmers and cooperatives, farmers and enterprises. "**Enterprises**" have the capacity to bring advances in science and technology to boost productivity, decrease the cost of production, and improve food quality and value of food products.

Moreover, the **State** should boldly adjust some policies related to land accumulation, policies for enterprises... to successfully implement this value chain and attract investment enterprises in agriculture sector. The State should have a reasonable policy, mechanism of land use tax, limit... for enterprises to invest, production - business. For cooperatives, a good business manager and a "charity" heart are needed to bring together the many farmers involved in the cooperative organization; from the new cooperative associated with the enterprise in the production and consumption of food products. The value chain exists and develops based on the harmony of stakeholders, but can not be used for administrative purposes.

The **State** should have a domestic market strategy and export. For the domestic market, tax policies need to be equal between branded and non-branded products. For foreign markets, the role of enterprises in the value chain is extremely important. Investing for businesses to find a market where the **State** has built a trust between agriculture and farmers.

The "**Farmers**" are important human resources for agricultural development, new rural construction and food produce. In the economy in our country, farmers are always the main labor force in the agricultural sector, the abundant and important human resources, and the success of new rural construction. In recent years, farmers are thanks to the application of scientific and technical achievements, farmers have produced more and more high quality agricultural products to better meet domestic consumption and export demands. Thereby, farmers have the conditions to improve their incomes, accumulate material, stabilize their life

and contribute to make the countryside more prosperous, creating the basis for the transformation of agricultural structure.

Besides, agricultural and rural industrialization and modernization is a great resource in transforming the agricultural economy into a rational economic structure in the direction of continuing to develop agriculture. At the same time, industrial and service industries are also strongly developed. This requires the famers to boldly reject the old way of thinking, the old way of doing things, the small farmer's behavior, dynamically grasp the needs of the market and anticipate its movements; at the same time, it is necessary to have capital, technique and labor to make the transition. Moreover, **farmers** are also the direct application of scientific - technical and technological achievements into production, increasing the scale to create a large volume of goods to meet the requirements of sustainable food value chain development of the country.

It is time for us to have a new mindset on sustainable agricultural and rural development in a value chain approach, as well as widespread dissemination of modern agricultural knowledge. Safe food sources for domestic market and export.

Finally, the next study surveys more than 400 persons related to food value chain and surveys more than 17 items of the sustainable food value chain development in others provinces.

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