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RESEARCH

Factors Affecting the Decision of Choosing Organic Vegetables of Consumers in Ho Chi Minh City, Vietnam

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Abstract

Organic vegetables are proven to be safe and good for consumers and help prevent some health hazards. Therefore, the demand for organic products has constantly been increasing worldwide. However, at present, organic vegetables and clean vegetables, which is popular in Vietnamese family meals are still in shortage. This study aims to identify factors affecting consumers' choice of organic vegetables in HCM City. A combination of qualitative and quantitative research are used, with the survey taking 450 consumers' opinions at 8 affiliated stores of 8 companies producing clean vegetables and 24 convenience stores specializing in distributing clean vegetables in Ho Chi Minh City. The research results have been identified and the factors affecting the decision of choosing organic vegetables of consumers in Ho Chi Minh City have also been analyzed including the following basic elements: (1) Brand awareness, (2) Product quality awareness, (3) Price awareness, (4) Environmental awareness, (5) convenience, (6) subjective standards (subjective opinions of consumers). The results of this research are the base for proposing solutions for sustainable development for businesses in particular and the clean vegetable industry in Ho Chi Minh City in general in the coming time.

Key words: alternative markets; consumer behavior; consumer satisfaction; green brand image; organic vegetables.

INTRODUCTION

The demand for organic and clean vegetables is an urgent need for people but at the moment, organic and clean vegetables are particular concerns to Vietnamese consumers. As an agricultural country, Vietnam has been exporting fruits and vegetables to many countries around the world, but paradoxically, more than 97 million people in Vietnam are now struggling with the "clean vegetable war" to get clean meals for my their family everyday, because of avarice, many vegetable growers hesitate to use chemicals, pesticides, stimulants for vegetables to grow strongly with green leaves, shorten harvest time, and reduce production expense.

After independence, Vietnam's agriculture was underdeveloped, the input cost was low, so the traditional farming method was mainly using fertilizer from ruminant animals such as buffaloes, cows and chicken. After 1976, like many countries affected by the consequences of the war, Vietnamese government applied several measures to improve food security, increase rural household income and develop commune economy like many other underdeveloped countries [13]. This intervention included the introduction and promotion using various industrial fertilizers, pesticides and hybrid seeds. Even the government has given significant agricultural subsidies to improve agricultural production which helped Vietnam from a food-shortage country to become a leading food exporter in the world. However, in nearly 50 years, the explosion of using pesticides and growth stimulants in the cultivation process has caused Vietnamese society to face with overusing pesticides, plant protection drugs, growth stimulants, genetically modified plant varieties, cancer which has appeared more and more etc.

Gradually, consumers are aware of and understand that consuming organic vegetables is good for their health. Organic agriculture has become one of the fastest growing industries in agriculture. Currently in the world, market of organic products has significantly increased. Market share has tripled from € 14 billion in 2000 to € 45 billion in 2010 [26]. However, in Vietnam, currently not many businesses are producing and trading organic vegetables and clean vegetables. It is not easy for consumers to find organic vegetables brand in Vietnamese market. Organic vegetables at high

prices are imported and are also rarely available in the market. Some Vietnamese enterprises have announced the production and distribution of organic vegetables; however, they have not given grounds to prove they are real organic vegetables. Meanwhile, the government and local authorities have not had close, clear and drastic regulations and mechanisms for licensing, inspection and supervision of manufacturing enterprises and trading organic vegetables, which is difficult to create trust in consumers.

Vietnamese consumers are currently dissatisfied with the quality of organic produce and organic vegetables. Vietnamese organic vegetable production and distribution enterprises are often small scale and sales network, so consumers have no opportunities to access. Also because of the fact that the number and size of organic vegetable enterprises are small and the distribution system is not professional, while the demand for organic vegetables in Vietnam is huge, the production and distribution of organic vegetables is considered a potential field. So, if any business meets the consumers' needs, it will develop quickly, strongly and sustainably.

LITERATURE REVIEW

Organic vegetables are vegetables grown based on emphasizing environmental protection and using natural farming techniques which do not contain artificial products, genetically modified crops, pesticides, growth stimulants, additives and chemical fertilizers [5].Vegetables fresh and pollution-free or organic vegetables believed to be vital for nutritious food and health that is beneficial to detoxify the body and prevention of diseases such as cancer, heart disease, hypertension, diabetes, kidney and stroke [21]. Most studies show that consumers love organic vegetables. Most organic products are said to have lower nitrate content, less pesticide residues, higher levels of vitamin C, phenolic compounds and omega-3 fatty acids and linoleic mixtures in milk produced by organically grown animals [7]. Consumers perceived organic vegetables as a healthier alternative to conventional foods in that they contain more nutrients which enhance personal well-being organic produce is also considered safer and better in taste and more enjoyable than conventional products [18].

For many decades, there have been many researches on consumers' concerns about the quality and food safety, which aims to

raise awareness and promote demand for organic food and agricultural products, as they are considered to be healthier and safer [4]. Consumer purchasing decisions on products had relationship with consumer perceptions of products quality and risk [27]. The consumer purchase decision on products or services is strongly influenced by customer perception of quality of value brand [17]. Consumers attach much importance to product brands in deciding on their choices. Organic certification proves to be a competitive advantage and a way of adding value to the product, and it enables access to different marketing channels, what allows the supplier to reach different groups of consumers [8].

Importance of health and environment as quality traits in the buying decision of organic products [11]. The impact of enterprises' production and business activities on the environment has been great in the past decades. Several businesses are also aware of this problem and have changed their business, production methods and models towards sustainable and environmentally friendly development [3]. One of the barriers for consumers is the price. The difference on organic products is how to growing, where organic products is avoid from chemicals that can harm the environment with strict of preservation. Thus making organic products are more expensive than conventional products [1].

However, some of consumers buy organic products is not as aware of the health and environmental effects but because of advised and habit of surroundings [6]. In addition, not all consumers considered that by buying organic products, have been keeping or help conserve the environment [2]. It is alleged lack of consumer understanding of product quality organic vegetables. Zuzanna Pieniaka et al., (2010**)** states "subjective and objective knowledge as determinants of organic vegetables consumption" [28]. Many shoppers are affected by their relatives, friends and marketing strategies of businesses. Many companies use marketing strategies by analyzing consumer behavior in order to study the effect on purchase decision [9].

Tyler J. Holmes & Ruili Yan (2012) carry a study at 11 grocery stores in Albuquerque, New Mexico, the United States, which also points out that consumers love organic products, but they are often less likely to buy these kinds of product for a number of reasons, such as consumers' sociodemographic characteristics, knowledge of

different produce types, "convenience" in travelling distance food and store area location has affected consumers' buying decisions [9,23]. Results reveal that almost all of the shoppers are awake to organic product and this awareness has influenced their consumption of organic product. Further, a majority of the shoppers thought-about value as a very important issue for his or her organic product consumption and have hooked up the next importance for certification from a acknowledged organization. Shoppers conjointly indicated that organic product ought to be sold in simply accessible outlets for the convenience of buying [14].

Research by Koen Mondelaers et al., (2009) and in most studies shows that consumers decide to choose organic vegetables because of health rather than other characteristics such as quality, environment, etc. Organic labels play an important role in consumers' choices [11]. Consumers favor organic products because their cultivation is considered to be healthier and more environmentally friendly than conventional farming. Consumers' buying intention is mainly driven by characteristics related to health affecting the frequency of purchases. Since the purpose of buying organic vegetables because of health and the conclusion of all organic vegetables studies is also good for health, that is the reason why the "health" factor is not included to measure in the research model.

Thus, based on the research results of relevant scholars, the opinions of experts and leaders of 19 enterprises in organic agricultural industry that this study is approached during the process of researching concluded the factors affecting consumers' choice of organic vegetables in Ho Chi Minh City (variable Y) and included the following basic elements: (1) Brand awareness, (2) Product quality awareness, (3) Price awareness, (4) Environmental awareness, (5) Awareness of convenience, (6) subjective standard (X variable).

METHODOLOGY

The research results were done through 02 qualitative and quantitative research methods which had three phases. Stage 1: Based on the doctrine, the theory and the results of scientific research concerning the above, the authors used qualitative research methods to conduct group discussions, consultation of experts aims to select the variables and variable observation group. Stage 2: Based on The

factors affecting the decision of choosing organic vegetables of consumers in Ho Chi Minh City, survey questionnaires were designed to collect comments from 450 consumers at 8 affiliated stores of 8 companies producing clean vegetables and 24 convenience stores specializing in distributing clean vegetables in Ho Chi Minh City. The model consisted of 6 scales with 30 observed variables (research question), using 5- point Likert scale (Likert scale with a 5- point), Distance value = (Maximum - Minimum) / n = (5 -1) / 5 = 0.8: 1. Completely disagree; 2. Disagree; 3. No opinion / Normal; 4. Agree; 5. Totally agree. Survey results input was used SPSS and Cronbach's alpha coefficient to test reliability of the scales. Stage 3, After testing the reliability using Cronbach's alpha coefficient, Exploratory Factor Analysis - EFA was analyzed to shrink and summarize the data of the scale. This method is based on extraction ratio factor (Eigenvalue), under which only those factors having ration (Eigenvalue) greater than 1 will be kept, those smaller than one will not show information better than origin variable because after standardizing, each original variance is 1. The method of extracting the main components (Principal components) and original method of factor rotation (Varimax Procedure) were used to minimize the number of variables that have large coefficients for the same factor, which increases explaining the factors. This result is used to analyze multiple linear regressions for testing assumptions of the model, which consider the impact level of factors, since then impact extent of these factors affecting the decision of choosing organic vegetables of consumers in Ho Chi Minh City is considered.

RESULTS AND DISCUSSION

Checking the reliability of scales

Table 1. Checking the reliability of scales

Variable	Code		Cronbach's Alpha
Independent variables	EA	Environmental awareness	0.807
	BA	Brand awareness	0.891
	PR	Product quality awareness	0.770
	PA	Price awareness	0.775
	CO	Convenience awareness	0.870
	SS	Subjective standards	0.835
Dependent variable	DE		0.824

Criteria utilized in performing the examination of scales: rejects observed variables having small Corrected Item-Total Correlation (smaller than 0.3). As indicated by Nunnal and Burnstein (1994), variables which have Corrected Item-Total Correlation smaller than 0.3 are considered refused variables and will be eliminated out of the model, the standard of choosing scale when having Alpha reliability bigger than 0.6. Therefore, in this examination the researcher exploited reliability coefficient of Cronbach's Alpha scale which is bigger than or equals to 0.6 and Corrected Item-Total Correlation is bigger than or equals to 0.3 then the scale will be reliable enough to complete the following steps.

Exploratory Factor Analysis (EFA)

Table 2. The results of EFA analysis for independent variables

No	Code	Observed variables	Factor						Cronbach's Alpha
			1	2	3	4	5	6	
	BA	BA04	.799						0.891
		BA01	.703						
		BA07	.674						
		BA06	.635						
		BA03	.618						
		BA02	.605						
		BA05	.555						
	CO	CO01		.824					0.870
		CO03		.763					
		CO02		.630					
		CO04		.552					
		CO05		.536					
		CO06		.530					
	SS	SS01			.814				0.835
		SS04			.636				
		SS05			.621				
		SS02			.611				
		SS03			.595				
	PA	PA01				.754			0.775
		PA03				.705			
		PA04				.631			
		PA02				.571			
	EA	EA02					.859		0.807
		EA01					.756		
		EA04					.603		
		EA03					.603		
	PR	PR01						.871	0.770
		PR02						.743	
		PR03						.740	
		PR04						.653	
Eigenvalues			11.595	2.223	1.582	1.461	1.229	1.066	
Variance extracted (%)			38.651	7.411	5.272	4.871	4.096	3.354	
Cumulative (%)							38,651		
Sig.							0,000		
KMO							0,934		

The results of EFA show that 30 observed variables are grouped into 6 factors. Variables with Factor loading are greater than 0.5, so the observed variables are important in the factors, they have practical significance. The coefficient KMO = 0.934> 0.5, therefore EFA is in accordance with the data. Testing Bartlett's test has a significance level of 0.000 <0.05, so the observed variables are correlated in terms of the overall scope. Eigenvalue value = 1,006> 1 is satisfactory, 30 observed variables are grouped into 6 factors. The variance was 38.651%, indicating that 6 factors explain 38.651% of the variation of research data. 6 factors formed after EFA analysis are Cronbach's Alpha values> 0.6, so these 6 scales are satisfactory when analyzing in the next steps.

Performing EFA by extracting the Principal component element with Varimax rotation.

Table 3. The Results of EFA for dependent variables

No	Observed variables	Satisfaction
1	DE02	.785
2	DE01	.690
3	DE03	.796
Cronbach alpha		0.824
Sig.		0.000
KMO		0.696
Eigenvalues		2.225
Variance extracted (%)		74.164

The results of EFA for the dependent variable show that all variables with factor loading are greater than 0.5 so the observed variables are essential and practical meaning. The coefficient KMO = 0.696> 0.5, therefore EFA is in accordance with the data. Testing Bartlett's test has a significance level of 0.000 <0.05, so the observed variables are correlated in terms of the overall scope. The Eigenvalue value = 2.225> 1 is satisfactory, the three observed variables are grouped into one factor. The variance method is equal to 74.164%, indicating that the dependent variable factor explains 74,164 variations of research data. The factor formed after analyzing EFA for dependent variable has Cronbach's Alpha value> 0.6 so this scale is satisfactory when analyzing in the next steps.

Pearson correlation analysis

Table 4: Pearson correlation analysis's table

		DE	EA	BA	PR	PA	CO	SS
DE	Correlation coefficients	1	.730**	.779**	.724**	.467**	.728**	.734
	Level of meaning Sig.		.000	.000	.000	.000	.000	
	Total number of survey	333	333	333	333	333	333	
EA	Correlation coefficients	.730**	1	.712**	.629**	.385**	.566**	.541
	Level of meaning Sig.	.000		.000	.000	.000	.000	
	Total number of survey	333	333	333	333	333	333	
BA	Correlation coefficients	.779**	.712**	1	.721**	.375**	.585**	.652
	Level of meaning Sig.	.000	.000		.000	.000	.000	
	Total number of survey	333	333	333	333	333	333	
PR	Correlation coefficients	.724**	.629**	.721**	1	.378**	.576**	.196
	Level of meaning Sig.	.000	.000	.000		.000	.000	
	Total number of survey	450	450	450	450	450	450	
PA	Correlation coefficients	.467**	.385**	.375**	.378**	1	.382**	.557
	Level of meaning Sig.	.000	.000	.000	.000		.000	
	Total number of survey	450	450	450	450	450	450	
CO	Correlation coefficients	.728**	.566**	.585**	.576**	.382**	1	.667
	Level of meaning Sig.	.000	.000	.000	.000	.000		
	Total number of survey	450	450	450	450	450	450	
SS	Correlation coefficients	.734	.541	.652	.196	.557	.667	1
	Level of meaning Sig.	.000	.000	.000	.000	.000	.000	
	Total number of survey	450	450	450	450	450	450	450
** Correlation is significant at the 0.01 level (2-tailed).								

The results of Pearson correlation analysis in table 4 show that all independent variables are correlated with the dependent variable at the 1% significance level with 99% reliability. The dependent variable DE has the strongest correlation with the independent variable BA (Pearson coefficient = 0.779) and the weakest correlation variable with the independent variable is PA (Pearson coefficient = 0.467). This close correlation is expected because these close relationships between variables explain the effect on model results. Therefore, these independent variables can be included in the regression analysis explaining the extent to which the results of the research model are affected. Among the independent variables, there is also a strong correlation with each other at the 1% significance level corresponding to 99% reliability.

Multivariate regression analysis

Table 5. Result of multivariate regression analysis by Enter method

Model	Unstandardized coefficient		Standardized coefficient	t	Sig.	Plus line Statistics	
	B	Standard deviation	Beta			Acceptance	Magnification variance coefficient
Constant	-.227	.101		-2.259	.024		
EA	.090	.025	.096	3.563	.000	.611	1.637
BA	.312	.036	.307	8.778	.000	.361	2.770
PR	.063	.019	.075	3.395	.001	.900	1.111
PA	.083	.030	.082	2.739	.006	.488	2.049
CO	.336	.031	.354	10.958	.000	.424	2.356
SS	.196	.033	.185	5.934	.000	.455	2.196
R	0.897						
R Square	0.804						
Adjusted R Square	0.802						
Durbin Wastson	1.806						
F (303,168)	Sig. = 0.000						
Regression	DE= 0.096*EA + 0.307*BA + 0.075*PR + 0.082*PA + 0.354*CO + 0.185*SS						

The results in table 5 show that the R-coefficient has a value of 0.897, which shows a strong correlation among the variables in the model. The regression results of the model show that the value of R2 (R Square) is 0.804, which indicates the appropriate level of the model is 80.4% or in other words, 80.4% of the variation of the consumers' satisfaction variables is explained by 6 factors. The value of adjusted R2 (Adjusted R Square) reflects more accurately the fit of the model than the whole, we have adjusted R value by 0.802 (or 80.2%) with F Change test, Sig ≤ 0.05 means a linear regression model between satisfaction and 6 influencing factors exists.

ANOVA table shows that the statistical value F is calculated from the full R2 value different from 0, which is worth Sig. = 0.000 (<0.05) is very small, showing that the model used is suitable for the data set and the variables meet the acceptance criteria (Tolerance> 0.0001). With the number of observed variables n = 450, the number of parameters ß - 1 = 6 (k2 = 6), the significance level is 0.01 (99%) in the Durbin – Watson statistics, dL (the lower statistics) = 1.613 and dU (the above statistics) = 1.735, the Durbin-Watson (d) = 1.806 coefficient is in the range (1.735; 2.265) so there is no autocorrelation between the remainders of the model. Thus, this research model is statistically significant.

Regression results show that there are 6 factors affecting the consumers' decision to choose organic vegetables in Ho Chi Minh City (DE), and the order of impact levels are as follows: (1) Convenience (CO), Beta = 0.354; (2) Brand awareness (BA), Beta = 0.307; (3) subjective standards (SS), Beta = 0.185; (4) Environmental awareness (EA), Beta = 0.096; (5) Price awareness (PA), Beta = 0.082; (6) Product quality awareness (PR), Beta = 0.075. Acceptable research hypotheses are H1, H2, H3, H4, H5, H6.

The results of this study also have many similarities with the research results of many following scholars such as John Thogersen et al., (2015) on "Consumers' motive and attitude of buying organic food in two emerging markets: China and Brazil", that is belief of health, quality and environmental friendliness which are important factors determining consumers' choices [10]. The study of Piyasiri and A. Ariyawardana (2002) also identifies the majority of respondents (65%) is willing to buy organic products from local suppliers that have certified organic and safe products and quality; Eighty one per cent of the respondents indicated that they would like to consume organic vegetables regularly; Accessibility and convenience of purchasing were considered to be important factors. Ninety-four per cent of the consumers indicated that shop environment should be favorable; A majority of the respondents (63%) indicated that packaging is an unnecessary feature for organic products since it adds an extra cost for the organic product.

Simona Naspetti & Raffaele Zanoli' research (2009) says customers are willing to pay for organic products; the higher the income of consumers is, the more likely they are to pay high prices for organic products. Consumers' interest is recognized as positive signs for a promising market of organic products in near future [20]. However, the research results of Piyasiri and Ariyawardana (2002) show that 81% of respondents think that price is an important factor in determining their buying behavior. Nine percent (9%) reveals that prices are not an important factor, while 10% of respondents were neutral. This shows that the majority of consumers in this study are not willing to pay high costs for their health benefits. Therefore, the price of organic products should compete with conventional products. This result provides recommendations to manufacturers, marketers with clear goals for consumers at a reasonable price, otherwise high prices may lead to lower demand.

Purchasing decisions can be measured through several dimensions, including recommend, purchase frequency, price, overall satisfaction and purchase intention [19]. The measure is not different from the study by Liu et al. (2009:72) which provide specifications for purchasing decisions by some measures, including product selection, brand selection, object selection, and purchase quantity. Consumer purchasing decisions on products had relationship with consumer perceptions of quality and risk products [27]. Consumer interest in the products can be improved by an increase in the quality of products[12]. And previous research has argued that a consumer perception of quality has a positive impact on consumer buying behavior [24].

The results could be used as input of information for retail enterprises, in improving consumer purchase decision on organic vegetable products, through an increase in value of consumer perception of quality. Management retail is expected to examine how to create a green marketing strategy through consumer behavior. Realized that the Green Marketing Strategy is a current marketing strategy, and adopted by many companies in attracting customers. Strategy increased perception of quality consumer of organic product can be appropriate tools to practice of Green Marketing Strategy. Results of this research have corresponding with Yee et al [27], despite having differences on the object of research. Results of the multivariate analysis disclosed that of the socio-demographic factors, income, environmental education and years of education considerably influence the temperament to obtain organic vegetables [14].

Overall, this result and numerous other research results show that there has been an upsurge in consumers' awareness and interest in food, especially safe, nutritious and high quality vegetables, which is due to the amount of food affecting each person's health and the prevention of disease [15]. However, there is still unsafe food and vegetables appearing in Vietnam and many different places in the world. Its consumption does not only increase health, but it does not guarantee nutritional safety as well. The use of too much pesticides, chemical fertilizers and growth stimulants has led to land degradation, affecting food production [16] and causing environmental pollution. Pesticides are used to protect crops and fight pest infestation, however, businesses need to reduce pesticide to a safe level to ensure harmless vegetable supply to consumers [22]. The

urgent need now is to change some methods in food production and distribution systems to ensure safe food production and supply [25].

CONCLUSION

Thus, the research results show the factors affecting the decisive choice of organic vegetables of consumers in HCM city includes (1) Brand awareness, (2) Product quality awareness, (3) Price awareness, (4) Environmental awareness, (5) convenience, (6) subjective standards (consumers' subjective opinions). The results of this study are the basis for businesses to propose solutions in order to improve the consumers' choice of organic vegetables in Ho Chi Minh City in the future.

RECOMMENDATIONS

Based on the results of this study, proposing solutions for sustainable development for businesses in particular and the clean vegetable industry in Ho Chi Minh City in general in the coming time:

On the side of businesses
Firstly, it is necessary to increase the scale of safe vegetable production in order to increase supply in the market to reduce costs and improve sustainable competitiveness.

Secondly, it is necessary to widely apply the models of organic vegetables cultivation tested in practice and advanced techniques on cultivation in order to save costs and shorten production time.

Thirdly, it is necessary to complete preliminary processing and preserving vegetables to ensure stable quality because in general, this process of enterprises was still very rudimentary.

Fourthly, due to the limited information exchange among components in the supply chain, the effect of vegetable supply chain in Ho Chi Minh City is limited, especially product quality and vegetable loss through each component in the entire value chain. Therefore, there is a need to build the trading of data among the inventory network performers.

On the side of the authorities

Firstly, it is necessary to strengthen the inspection and handle units or individuals consuming vegetables which are not in line with commitments to consumers in order to avoid the occurrence of unsafe vegetables sold next to the safe vegetables, causing discontent for vegetable growers and make consumers confused.

Secondly, in Vietnam, safe vegetables have only been tested for pesticide residues by two quick tests for pesticide and other diseases. For the inspection of heavy metal and nitrate residues, the cost is high, and the time to produce results by this method is long, therefore businesses are not excited to participate. Current rapid inspection methods are only qualitative so it is difficult to be a basis for controlling if vegetables are not safe for consumers. In addition, the inspection of pesticide residues on vegetables in Vietnam today only stops at reminding level and there have had no strict sanctions yet, so ensuring consumers' rights is still not thorough.

Thirdly, it is a must for local authorities to coordinate with enterprises to promote the concentrated, large-scale safe vegetable production areas with specific plans and action programs.

Fourthly, it is advisory to support enterprises and cooperatives to build vegetable brands according to the standards of countries in the region and the world to enhance the expansion oversea markets.

Fifthly, it is a compulsory for authorities to coordinate with enterprises to improve vegetable distribution circulation system to ensure the supply chain is operated efficiently and sustainably.

Sixthly, Vietnam's agricultural sector in general and Ho Chi Minh City in particular should coordinate with domestic and foreign units to organize regular training courses on technical support for how to preserve products; how to pack products; how to transport in the right way; how to promote; coordinate with market research companies to more thoroughly understand and frequently of consumers' tastes to share with market information, diversify domestic products and expand export markets.

LIMITATIONS OF THIS STUDY

The results of this study indicate the scope of focusing on the primary analysis of data, lack of analysis and comparison with secondary data.

In fact, information on secondary data published in Vietnam is not transparent and honest. Besides, the sample is not large, the opinions of more than 450 consumers, but it limits a few consumers, therefore, it can not be rated the overall development situation of organic vegetable in Vietnam. Consequently, it also has more or less impact on the study results.

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