

RESEARCH ARTICLE

Evaluating Several Models of Quality Management and Impacts on Lychee Price Applying for Vietnam Agriculture Products Value Chain Sustainable Development

Pham Van Hong^{1*} • Nguyen Thao Nguyen² • Dinh Tran Ngoc Huy³ • Nguyen Thu Thuy⁴ • Le Thi Thanh Huong⁵

¹Vietnam Institute of Science, Technology and Innovation, Vietnam. E-mail: phamvanhong1973@gmail.com

²Thai Nguyen University of Economics and Business Administration (TUEBA), Vietnam. E-mail: thaonguyen363@gmail.com

³Banking University HCMC, Ho Chi Minh City, Vietnam.

International University of Japan, Japan. E-mail: dtnhuy2010@gmail.com

⁴Thai Nguyen University of Economics and Business Administration (TUEBA), Vietnam. E-mail: thuthuytn1211@gmail.com

⁵Dai Nam University, Vietnam. E-mail: lethanhhuong@dainam.edu.vn

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ABSTRACT

Sustainability of Vietnam agriculture value chain will be dependent on various factors such as skills and experience of farmers, advanced technology, agricultural engineering, standards and models such as VIETGAP or GLOBAL GAP, etc. The role is still important, but Vietnam's agricultural production still has many Weakness points compared to other countries in the region when comparing resource use efficiency (land, water and labor). As a result, the efficiency of agricultural production tends to decrease recently. Specifically, the growth in average agricultural labor productivity annual rate of Vietnam also decreased correspondingly from 2.7% in the period 1990-1999 to 2.5% in the period 2000-2013 (World Bank, 2016). In Vietnam, we will evaluate the effectiveness of VIETGAP and GLOBAL GAP models, principles and standards applying in Vietnam agriculture value chain in a specific case study. The research results show a strict condition for applying VIETGAP and GLOBAL GAP for better quality in agriculture, including: Conditions for soil, irrigation water, fertilizers, pest control, etc. Last but not least, we also use an econometric model to measure impacts of multi macro factors on lychee price in Vietnam market over past years 2014-2019. Regression results show that we need to control inflation at low level, stable GDP growth and trade balance and exchange rate to stabilize lychee price. The research findings are of value to policy makers, farmers and investors in making decisions to invest for sustainability of Vietnam agriculture value chain. We will also make suggestions for commercial bank system in agriculture sector development.

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Introduction

VIETGAP and GLOBAL GAP quality control models applying in agriculture will affect sustainability of Vietnam agriculture development.

Applying VIETGAP will have some benefits for consumers because of Pest and disease prevention, i.e:

Do not overuse Plant Protection drugs on plants.

- Do not use chemical plant protection drugs banned from use for vegetables.
- Choose drugs with low active ingredients, less toxic to natural enemies (animals or parasites are used to kill harmful organisms, protect crops naturally like dragonflies, mantis, worms...).
- Prioritize the use of biological products, herbal preparations, and natural enemies for disease

* Corresponding author: phamvanhong1973@gmail.com

prevention instead of chemical drugs to protect the safety of plants, soil, water and ambient air around.

- Finish spraying at least 5 to 10 days before harvest.



Moreover, VIETGAP standards specify that:

User personnel must be knowledgeable and supervised by technical experts.

Conditions of soil: vegetable land must be high, easy to drain water, suitable for the growth and development of each vegetable.

Seeds: find the source variety.

The vegetable growing area must be isolated from the waste area. There is absolutely no residue of harmful chemicals in the soil.

Conditions for irrigation water, fertilizers, pest control.

Harvest and preliminary processing: To ensure that the production places and the preliminary processing stages must be hygienic, and each stage must be strictly controlled.

Have a license to satisfy conditions for safe production, issued by the Department of Agriculture and Rural Development.

Proper management and treatment of wastewater, vegetable growing areas must be isolated from waste areas. The soil absolutely must not have residues of harmful chemicals.

On the other hand, The Global Good Agricultural Practice (Global GAP) standards are international standards for good agricultural practice. This is the standard applied in both farming, husbandry and aquaculture which is very popular in many countries around the world, including Vietnam. This is also a standard to help businesses, small agricultural cooperatives can access global markets.



The Global GAP is a voluntary standard with the goal of building safe, sustainable agriculture globally. The Global GAP standard covers standards throughout the entire product manufacturing process, from farm inputs, seeds, medicines, and farming activities to finished products and sold. market. Global GAP cultivation is the global standard of good agricultural practice applied in the field of farming.

Hence, This study will figure out the impacts of VIETGAP and GLOBAL models and standards on sustainability of Vietnam agriculture value chain from now on.

Research Design

1) Research Issues

The scope of this study will cover:

Issue 1: What are the benefits and opportunities of GLOBAL GAP standards in agriculture?

Issue 2: What are the benefits and opportunities of VIETGAP standards in agriculture?

Issue 3: What are the correlation and impacts of multi macro factors on lychee price in Vietnam over past years?

Issue 4: Based on the research results, we will give some important recommendations for agriculture policy makers, farmers, investors and commercial banks.

2) Literature Review

There are some standards including VIETGAP, THAIGAP, ASEANGAP and GLOBAL GAP in agriculture.

Mustapha et al (2013) revealed in Ghana that the Global GAP certified pineapple farmers obtained GHS 15,027.57 for growing one hectare of pineapple while non-certified pineapple farmers made a net average income of GHS 6,256.36. These results imply that the Global GAP certified pineapple farmers obtained 2.4 times more net average income than non-certified pineapple growers. The results of this study have implications for pineapple farmers and policy makers in developing countries.

Tey et al (2016) hypothesizes additional explanations of this phenomenon through a review of both the GlobalGAP (international) and Malaysian Good Agricultural Practices (MyGAP) standards. Through content analysis, the findings indicate that MyGAP provides a weak institutional framework and market opportunity structure. In addition, since it lacks transparency and accountability, its credibility is questionable. Although it is not clear whether such a credibility issue has a direct impact on the local market, sustainable produce is neither differentiated nor rewarded through premiums. The GlobalGAP standard was found to be an exemplar, and potential improvements are suggested to help support local sustainability standards.

Fiankor et al (2017) provided further empirical evidence by assessing the effect of GlobalGAP certification on agrifood exports to high-value markets in EU and OECD countries. Empirically, we estimate a structural gravity model—that accounts for zero trade and endogeneity of certification—using a novel dataset of certified producers and land area cultivated to apples, bananas, and grapes from 2010 to 2015. While our results generally confirm the

trade-enhancing effect of GlobalGAP certification for both developed and developing countries, we show that the effects vary across products. Then, Hai, V.P. (2017) pointed Hanoi supports the use of 3 standards in urban vegetable production: VietGAP, RAT and Organic. Much of funding has been given to build infrastructure, analyze safety conditions of farms, and train farmers in specialized production zones. These operations are expected to help deliver safe vegetable to the 7 millions city's inhabitants, who consume mostly local products. Our study looks into the application of these standards. We use statistics from the General Statistic Office of Vietnam, and surveys upon Hanoi's cooperatives and farmers to understand the situation. Result show that the success of this policy is limited, because Hanoi's agriculture is much depending on cooperative's instruction on one side, and by the strong demand for conventional vegetables on the other side.

Beside, Hung Gia Hoang (2018) stated many farmers did not adopt VietGAP because of: 1) a lack of market demand for VietGAP-certified vegetables, 2) the risks associated with breaking informal institutions between farmers and preferred collectors; and 3) a lack of capability in key value chain actors. In contrast, a small number of farmers adopted VietGAP because of: 1) the level of support they received from the local government; and 2) their political aspirations and loyalty to the government. Luong Tinh et al (2019) showed farmers' intention to apply or continue applying VietGAP is driven by factors such as mutual communication, awareness of benefits, environment, behavioral control, and governmental support based on authorities policies and risk awareness.

Last but not least, Brummer et al (2020) mentioned that Global G.A.P. compliance has often become a key requirement for farmers to access high-value global markets. Yet, the global spread of certification is highly uneven among countries. Findings show that global agricultural trade networks remain relevant, but are no longer sufficient in explaining certification. Fostering a favourable business environment - via providing secure land tenure and a functioning judicial system - as well as investing in transportation and information infrastructure may facilitate farmers' participation in certification schemes. Stringency of existing public regulations is helpful for overcoming entry barriers. Hung, G.H. (2020) found out (1) there was a lack of concern about food safety amongst value chain (VC) actors, particularly consumers and this limited demand for VietGAP-certified vegetables; (2) subjective rather than objective measures were used to assess vegetable quality by actors throughout the domestic vegetable VC and (3) the coordination of this vegetable VC was dominated by informal, trust-based relationships between VC actors rather than through formal written contracts.

Within the scope of this paper, we examine the problems in declining sale amount of tea and lychee - main agriculture products in Thai Nguyen and Bac Giang provinces. Then we make suggestions to apply VIETGAP and GLOBAPGAP for better quality of products to expand to global markets.

We identify our research gap: first, it differs from previous studies in the aspect that we use VIETGAP to make recommendations, second we perform analysis in 2 provinces of Vietnam: Thai Nguyen and Bac Giang.

3) Concepts

Global agricultural value chains are activities that create value added from production to processing and distribution of products to consumers. The Stages in the value chain may have vertical or horizontal links together. Chain actors can be involved in one or more other operations each other in the value chain; This depends on your goals, strategies, and capacities of those subjects. Basically, the global agricultural value chain is not much different from other global value chains. However, the agro value chain has several other characteristics Especially requires businesses, farmers and chain stakeholders to have Appropriate policies and strategies will help them participate better in the global value chain. Because agricultural products are often seasonal, the harvest time is short and easy The failure requires adequate storage and post-harvest handling with current technology and capacity great. Besides, agricultural productivity and output are also easily affected by time secretions, disease outbreaks, and food safety and hygiene.

Methodology and Data

Study subjects: Identify the barriers and causes that inhibit marketing participating international market of tea and lychee products.

Research scope:

Space: Thai Nguyen Province (Tea) and Bac Giang Province (Lychee).

Time: At industry level: from 2011 to 2018.

At the tea and litchi product chain level: 2018.

About content: Clarifying barriers and reasons for tea product restrictions and Lychee fruit entered the international market.

The study use qualitative analysis, analytical, synthesis, descriptive statistics and historical and dialectical materialism methods to identify problems and make suggestions for quality management models applying in tea and lychee products in Vietnam agriculture sector.

Finally, We build an econometric model with multi macro factors affecting lychee price in Vietnam market as follows:

$$Y(\text{lychee price}) = f(x_1, x_2, x_3, x_4, x_5)$$

In which: x_1 : CPI Vietnam, x_2 : GDP growth Vietnam, x_3 : Exchange rate, x_4 : Trade balance, x_5 : lending rate.

Main Results

1) Evaluating Tea and Lychee Markets and Obstacles for Development

In general, lychee fruit has initially joined the market of developed countries, Lychee farmers make a profit, many households can get rich from lychee trees. For In the domestic market, lychee fruit is also gradually distributed through channels formalities such as supermarkets, retail

chains with higher standards. However, litchi fruit currently mainly focuses on 2 traditional markets China and in the domestic informal market (street vendors, sidewalks, markets system). Most of the factors that support lychee in the global value chain are still present weak. Except for production inputs (biological pesticides, micro fertilizers farmers, production tools,...) the farmers are quite easily accessible, the rest are mostly supporting factors such as post-harvest support services (infrastructure, research, testing, logistic,..); In production organization, the capacity of the enterprise is still weak. Therefore, the using opportunities from Vietnam's integration policy with the world has not really achieved results best possible results.

Table 1. Market requirements and current capacity of lychee fruit in Bac Giang province

Required level and the capacity	Area code/ Origin	Criteria food safety (bacteria, fungus,...)	Size, Color
Requirements from developed countries (US, Japan, EU, Australia,...)	High	High	High
Response capacity	Good	Weak	Weak
Inquiries from developing countries (China)	Medium	Low	Medium
Response capacity	Good	Good	Good
Inquiries from domestic market	Low	Low	No
Response capacity	Good	Good	Good

We need to find out quality solutions for this problem.

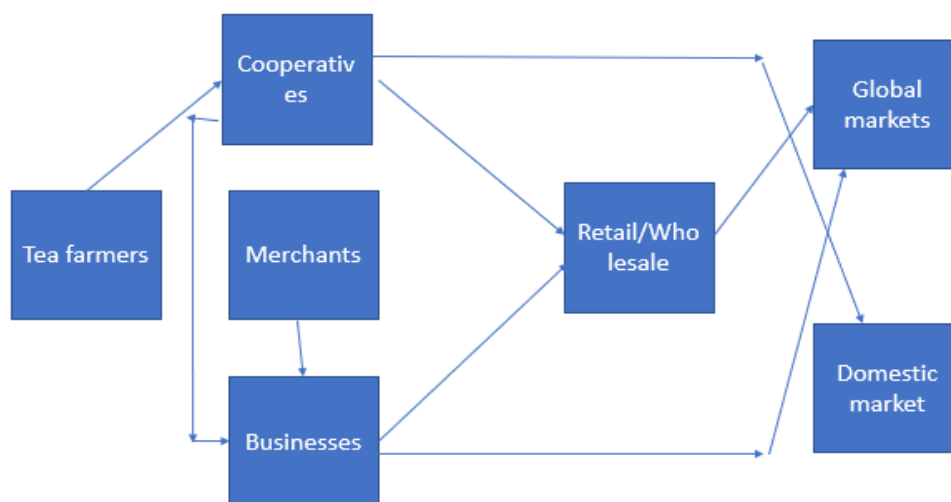
On the other hand, Changes in tea market structure of Vietnam to developing countries development tends to be negative even though the import tax rate is increasingly being cut.

From 2007 onwards, the output is exported to countries with high demand for pepper standards such as EU, Japan, Australia, Canada,... have a clear tendency to decrease (see more Table 2). The cause of this decrease may be due to an increase in the number of species regulations on food safety and hygiene as well as lowering the food safety for some chemical types of plant protection. Especially, in 2009, exports from Vietnam to other countries: The EU countries (as well as the UK, France) and Japan have declined significantly due to their inability to outperform passed the tests on food safety and hygiene.

Table 2. Vietnam's largest tea export markets (% by volume amount)

	2013	2014	2015	2016	2017
Total of the whole country	100	100	100	100	100
Pakistan	16.2	26.5	29.2	29.7	23
Taiwan	15.9	17.4	14.1	9.6	12.6
Russia	8.3	8.6	12	12.5	12.5
China	9.9	9.7	6.2	6.3	7.7
Indonesia	8.3	4.3	7.8	11.9	6.9
US	7	7.5	6.3	4.8	5
UAE	2.7	2.7	4.9	2.3	4.8
Malaysia	2.6	2.6	2.3	3.4	2.6
India	0.8	0.8	0.1	1.9	1.2
Arab	1.6	1.7	1.6	1.1	1.2

(source: Vietnam Custom)



(source: made by author group)

Figure 1. Tea distribution channels of Thai Nguyen Province

Beside, According to the population groups, the Kinh people have higher profits from tea cultivation ethnic minority groups. Ethnic minorities often live in disadvantaged areas (ethnic people usually live in the

mountainous areas of Dai Tu district, far from the center, markets,...) Compared with Kinh people in Tan Cuong, Thai Nguyen city, the land is poor in color fat and tea quality is also worse. However, even on the same area as the thing the same natural conditions, the profit from tea cultivation of

the ethnic minorities is still low than the Kinh people living there. The reason is the ethnic minority group having technical skills Tea planting and tending and market access skills are more limited than people Kinh. Poor qualifications and capacity are also the reason for the profits from tea cultivation headed households with lower secondary education attainment than heads of households, Education high school level and above.

Table 3. Compare profits of tea growers by different groups 1,000 VND / kg (fresh tea)

	Cost	Revenue	Profit
Total	18,556	37,190	18,634
By location			
Thai Nguyen city	15,863	42,454	26,591
Dai Tu district	22,515	29,455	6,940
By ethnicity			
Kinh	17,707	37,610	19,903
Minorities	25,851	33,588	7,738
Education of household			
Secondary school and below	18,804	36,409	17,604
High school and above	17,249	41,308	24,059
Linking			
Join link	16,083	41,816	25,733
No link	19,308	35,784	16,476

(source: calculation of author group)

2) SWOT Analysis for VIETGAP Standard

Strengths

VIETGAP for better agriculture will specify

- Production technical standards: specify production techniques from the selection of soil, varieties, and fertilizers to harvest in accordance with specific regulations for each field of cultivation, husbandry and aquaculture.
- Food safety: Including measures used to ensure that food is free from chemical contamination or physical contamination when harvested, absolutely safe when reaching the hands of consumers. Working environment: good arable land, adequate water resources to ensure standards to prevent the abuse of labor force of farmers.
- Product Traceability: This standard allows the consumer to easily identify a product through the process from seed to finished product and put it on the market. At the same time through traceability, users will know complete accurate information about the manufacturing business.
- For consumers, using products with food hygiene and safety quality.
- They easily recognize products that ensure food hygiene and safety on the market when there is a VietGAP product certification mark.

Weaknesses

- It will cost some money for farmers to follow VIETGAP process.
- Some areas have not enough conditions about fertilized land: can not apply VIETGAP.

Opportunities

- It helps to create products with high quality, stability and absolute safety for the health of users.
- Creating competitive advantages, improve manufacturers' brands, process and distribute, create stable consumption markets.
- Ensuring the output quality of the product, thus keeping its reputation with customers and increasing sales.

Threats

- It faces challenges from new standards such as GLOBAL GAP.
- It receives bad effects from trade war of Covid 19.

Beside, when we apply VIETGAP we need to pay attention to:

1. Land for Cultivation

- Find cultivated land with a high location, easy drainage to suit the growth and development of vegetables.
- Not affected by product pollution factors such as dust, waste, toxic chemicals from daily activities of people and industrial parks.
- The cultivated location must be isolated from the area with industrial wastes and hospitals at least 2km, and at least 200m from municipal domestic wastes.
- To ensure that the soil is free from toxic chemical residues, the content of heavy metals in the soil, and the substrate do not exceed the regulations.
- If the cultivated land contains heavy metals in excess of permissible values, there must be appropriate cultivation and farming practices.

2. Irrigation Water

- Use irrigation water from clean rivers or ponds that are not polluted, or have been treated with care and must ensure safety and hygiene.
- Use well water to water lettuce and seasoning vegetables.
- Foliar fertilizers and plant protection products must be mixed with clean water for irrigation.

3. Seed

- Must know the origin of the place of production, if imported varieties must go through the quarantine thoroughly before planting.
- Only cultivate good varieties and plant healthy seedlings without any source of pests and diseases.

Pre-sowing seeds need to be treated with chemicals or heat to kill pests and diseases, ensure good growth and development.

4. Fertilizer

- Using chemical fertilizers to fertilize just enough according to the requirements of different vegetables, 15 days before harvest, it is necessary to finish fertilizing.
- Do not use fresh manure or dilute fresh manure to water vegetables, so increase the use of organic fertilizers to fertilize vegetables.
- Only fertilizers on the list of fertilizers permitted to be produced, traded and used in Vietnam are allowed to be used, promulgated by the Ministry of Agriculture and Rural Development and currently in effect.

- Safety level, origin, product traceability.
- Biodiversity and friendly with the environment.
- Working conditions, labor safety and health of the person directly involved in the production.
- Environmental Protection.

Weaknesses

- It costs farmers some budget to receive certification, this might be hard for small farmers and producers

Opportunities

- Expand exporting markets for Vietnam agricultural products
- Improve quality of Vietnam agriculture products to meet global standards

Threats

- It has to compete with VIETGAP and other traditional standards

3) SWOT Analysis for GLOBAL GAP Standard

Strengths

Main Goals of GLOBAL GAP Include

4) Findings via an Econometric Model

First we look at descriptive statistic via below table:

We recognize that standard deviation of lychee price and exchange rate are highest values, while standard deviation of lending rate and GDP growth Vietnam are the lowest.

	LYCHEE...	CPI_VN	G_VN	EX_RATE	LENDINGR...	TRADEBA...
Mean	41500.00	0.062050	0.062900	22625.50	0.121260	-292.7000
Median	40000.00	0.044150	0.064450	22710.00	0.102500	-200.0000
Maximum	60000.00	0.181300	0.070800	23230.00	0.190000	400.0000
Minimum	30000.00	0.006300	0.050300	21405.00	0.080000	-1162.0000
Std. Dev.	9732.534	0.051312	0.007013	610.4436	0.039519	405.6183
Skewness	0.508816	1.389418	-0.527497	-0.932803	0.739536	-0.604563
Kurtosis	2.288052	3.988436	2.018715	2.742318	2.050788	3.718140
Jarque-Bera	0.642686	3.624556	0.864971	1.477870	1.286940	0.824047
Probability	0.725175	0.163282	0.648894	0.477622	0.525466	0.662309
Sum	415000.0	0.620500	0.629000	226255.0	1.212600	-2927.000
Sum Sq. Dev.	8.53E+08	0.023697	0.000443	3353773.	0.014056	1480736.

Figure 2. Descriptive statistics of multi macro factors in Vietnam

We also infer from the below results that an increase in exchange rate might make lychee price goes up, whereas an

increase in lending rate and inflation might cause lychee price goes down.

Correlation Matrix						
	LYCHEE...	CPI_VN	G_VN	EX_RATE	LENDINGR...	TRADEBA...
LYCHEE...	1.000000	-0.638378	0.468010	0.633855	-0.629445	0.642724
CPI_VN	-0.638378	1.000000	-0.310687	-0.780861	0.756683	-0.365201
G_VN	0.468010	-0.310687	1.000000	0.118478	-0.698635	0.186165
EX_RATE	0.633855	-0.780861	0.118478	1.000000	-0.682225	0.739087
LENDINGR...	-0.629445	0.756683	-0.698635	-0.682225	1.000000	-0.497212
TRADEBA...	0.642724	-0.365201	0.186165	0.739087	-0.497212	1.000000

Figure 3. Correlation matrix of multi macro factors in Vietnam

Dependent Variable: LYCHEE_PRICE
 Method: Least Squares
 Date: 12/14/20 Time: 11:45
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADEBALANCE	9.352885	9.828313	0.951627	0.3780
LENDINGRATE	-92021.82	92937.74	-0.990145	0.3603
EX_RATE	1.448329	7.749664	0.186889	0.8579
C	22626.99	183442.2	0.123347	0.9059
R-squared	0.543310	Mean dependent var		41500.00
Adjusted R-squared	0.314965	S.D. dependent var		9732.534
S.E. of regression	8055.313	Akaike info criterion		21.11523
Sum squared resid	3.89E+08	Schwarz criterion		21.23626
Log likelihood	-101.5761	F-statistic		2.379337
Durbin-Watson stat	2.812945	Prob(F-statistic)		0.168583

Figure 4. Regression for 3 factors model on lychee price

Therefore, we can see the equation:

$$Y = 9.35 * \text{Tradebalance} - 92021.8 * \text{Lendingrate} + 1.44 * \text{Ex_rate} + 22626.9, R \text{ squared}=0.54, \text{SER} = 8055.3$$

From the above equation, we see that Y (Lychee price) has positive correlation with Trade balance and Exchange rate, whereas it has negative correlation with Lending rate. Esp. Lychee price is highly negative affected by lending rate, then 2nd impact from trade balance. When trade balance goes up and lending rate goes down, lychee price will increase.

Dependent Variable: LYCHEE_PRICE
 Method: Least Squares
 Date: 12/14/20 Time: 11:44
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI_VN	-131053.6	116066.3	-1.129127	0.3220
G_VN	661998.4	764660.1	0.865742	0.4355
EX_RATE	-1.367565	13.63932	-0.100266	0.9250
LENDINGRATE	114373.3	190638.6	0.599948	0.5809
TRADEBALANCE	14.29806	12.32905	1.159706	0.3107
C	29250.16	356677.4	0.082007	0.9386
R-squared	0.700640	Mean dependent var		41500.00
Adjusted R-squared	0.326439	S.D. dependent var		9732.534
S.E. of regression	7987.563	Akaike info criterion		21.09287
Sum squared resid	2.55E+08	Schwarz criterion		21.27442
Log likelihood	-99.46434	F-statistic		1.872365
Durbin-Watson stat	2.548842	Prob(F-statistic)		0.281581

Figure 5. Regression model for 5 factors model on lychee price

Hence, we can see the equation:

$$Y = -131053.6 * \text{CPI} + 661998 * \text{G_VN} + 14.2 * \text{Tradebalance} + 114373 * \text{Lendingrate} - 1.36 * \text{Ex_rate} + 29250.1, R \text{ squared}=0.7, \text{SER} = 7987.5$$

From the above equation, we see that Y (Lychee price) has positive correlation with Trade balance, lending rate and GDP growth Vietnam, whereas it has negative correlation

with CPI and exchange rate. Esp. Lychee price is highly negative affected CPI, then 2nd impact from lending rate and GDP growth, and trade balance then. When trade balance goes up and inflation, exchange rate goes down, lychee price will increase.

Discussion

VietGAP (Vietnamese Good Agricultural Practices) are regulations on good agricultural practices for agricultural and aquatic products in Vietnam; Including principles, order, and procedures to guide organizations and individuals to produce, harvest and preliminary process to ensure safe products, improve product quality, ensure social welfare and health. producers and consumers, protecting the environment and traceability of products.

Applying VIETGAP in agricultural production will help us:

- Evaluation and selection of production areas
- Variety, seed and rootstock
- Management of land and substrate
- Fertilizers and additives
- Water for crops
- Chemicals (including inorganic fertilizers and pesticides)
- Harvest and post-harvest treatment
- Waste management and treatment
- Labor safety
- Documentation, recordkeeping, traceability and product recall
- Internal check
- Complaints and complaint settlement

When we practice GLOBAL GAP:

- For example, clean the soil source, ensure the safety of the water source;
- The origin of the plant variety must also be carefully selected to ensure disease-free because if it is not guaranteed, it will affect the quality of the product, especially the unclean variety is more susceptible to disease than healthy varieties.
- Fertilizers and plant protection products are also prescribed very strictly in this standard; Be sure to use those allowed in the list. Most of them are of organic origin, safe for users and not harmful to the environment. Traceability is indispensable in the set of standards, growers must record the entire production process from the selection of varieties, planting to harvesting and post-harvest preservation. This is to ensure traceability when necessary, to prevent food safety incidents from occurring.

In fact, The consumer market has a positive shift, which is to increase the domestic market share. Specifically, domestic consumption accounts for 52.5%; the export market is 47.5%.

The average selling price of lychee this year is 31,200 VND / kg (lower than the 2019 litchi crop), but in return the increased output (15,000 tons), so the total value obtained from lychee and ancillary services is about 6,900 billion VND, an increase of 600 billion VND compared to the fabric crop in 2019 (source: baobacgiang.vn, date access 11/12/2020).

Regarding export, this year, for the first time, Bac Giang lychee has set foot in the fastidious market of Japan (about 200 tons). Vietnamese lychee fruit is very popular with Japanese consumers.

This year is also the first year Bac Giang province actively coordinated with the Ministry of Industry and Trade and the Ministry of Agriculture and Rural Development to organize an online conference on promoting the consumption of lychee on a large scale with 63 bridge points nationwide and 4 bridge points in 2 provinces. Yunnan, Guangzhou (China). The conference has helped promote the consumption of lychee.

Besides, the border gates in Lang Son, Lao Cai have given priority to the export of lychee to China.

We also see from the below tables that before 2015, Vietnam is still in the top 3 countries in the world producing lychee fruit.

Table 4. Lychee production in Vietnam compared to the world (source: vietnamtradeoffice.net, dat access 12/12/2020)

Country	Production (tons)	Ratio (%)
China	1.482.000	57
India	624.000	24
Vietnam	156.000	6
Madagascar	100.000	3.85
Taiwan	80.000	3.08
Thailand	43.000	1.65
Nepal	14.000	0.54
Bangladesh	13.000	0.5
Reunion	12.000	0.46
South Africa	8.600	0.33
Mauritus	4.500	0.17
Mexico	4.000	0.15
Pakistan	3.000	0.12
Australia	2.500	0.1
Israel	1.200	0.05
US	600	0.02
Others	51.600	1.98
The world	2.600.000	100

Conclusion and Recommendations

Form the above econometric regression model, we find out that an increase in inflation and decrease in GDP growth, as well as reduction in trade balance and increase in exchange rate might cause lychee price in Vietnam declines. The implications are that we need to control inflation at low level, stable GDP growth and trade balance and exchange rate to stabilize lychee price.

From the research findings, we can see that benefits of applying VIETGAP and GLOBAL GAP for Vietnam agriculture value chain (for developing tea and lychee markets) including Social benefits such as:

- Affirming the names of Vietnam's aquaculture, cultivation and livestock products.
- Increase export turnover by overcoming technical barriers, not violating regulations and requirements of importing countries.
- To change current production practices, the society can reduce medical costs, improve the quality of life of the community.
- Help strengthen the livestock industry, cultivation sustainably; minimizing negative impacts on the environment and ensuring benefits for the whole society.
- Create a close link that brings high benefits between farmers, scientists, producers and managers.

The implications for policy makers, Ministry of Agriculture is that we need to match VIETGAP standards with exporting standards to expand market for Vietnam agriculture products. Next, we also need to create better mechanism and legal framework for raw materials in agriculture, together with strict regulations on producing fake fertilizers.

Production linkage between farming households, between farmers and businesses.

Investing in constructing synchronous infrastructure for agricultural production (irrigation, transportation connection in production and with the market).

In the past period, Vietnam has had many priority policies for development investment.

industry and has won many quite important achievements. However, to promote 130 food processing industry and rural agriculture, period.

In the next period, Vietnam should give priority to invest in infrastructure development for the agricultural sector (connecting roads; irrigation; agro-processing zones / clusters; review service centers.

soil, water, agricultural products,...). The past few decades have affirmed, Agriculture is an industry with potential advantages and great spillover effects on labor rural areas, especially the poor and ethnic minorities. If interested right from the production, processing, branding to enter the market In developed countries, the potential contribution of this area to the economy will be high a lot more than now.

Recommendations for Applying Quality Management in Tea and Lychee Markets

We need to enhance using of technology software and planting technology in our agriculture sector.

Beside, minimum standards for tea that growers, Processing and export must meet the requirements of:

- GlobalGAP with 4 standards: i) manufacturing technical standards; ii) standards of food safety (using chemicals below permitted standards); iii) standards of working environment; iv) product origin standards.

- Achieve ISO 3720 standard on black tea; ISO 11287 standard on green tea; pepper ISO 14502 standard on identifying the specific ingredients of green tea and tea black.
- Certificate of meeting HACCP, ISO 22000, GHPs, SSOPs and GMPs about food safety

Suggestions for Commercial Bank System

- Banks need to share risks with farmers before unexpected movements of products price
- Banks need to offer derivative instruments for farmers and create a mechanism to share risks with them
- Models of cooperative in agriculture need to be joined by commercial banks to invest and finance

Limitations of Research and Future Research Direction

First of all, the data used in this study was collected limited only in the case of planting sector of agriculture industry. Hence, we can expand to other sectors in Vietnam agriculture..

Besides, this study only uses Vietnam case while we can expand our research for other emerging markets such as China, India, etc..

Therefore, in the future, the development directions of this research can be developed by adding other variables such as micro and macro level variables,... into our model to measure impacts of them on quality of agriculture products.

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