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Status and Solutions on Safe Vegetable Production Development in Hanoi, Vietnam

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----------ABSTRACT----------
Hanoi, the capital of Vietnam, is located in the Red River Delta. It has fertile land and large agricultural production area in the Northern Delta. In recent years, Hanoi has focused on expanding the safe vegetable production to provide fresh vegetable sources with high quality for the inhabitants. In this article, based on data collected from agricultural agencies, combined with field surveys, we have processed the data and used economic indicators to evaluate the effectiveness of safe vegetable production in the city in the period from 2005 to 2015. The results showed that, during this period, the safe vegetable area and production were variable but unstable. However, in recent years it has increased thanks to the policies of promoting the development from the state agencies and enterprises. The data in 2015 has shown that the economic efficiency of the safe vegetable production in this locality is still low (Efficiency in capital use is 1.56; Efficiency in investment cost is 0.56, Profit/ha/year is 74.69 million). To achieve the long-term effectiveness for the development of the safe vegetable production, it is necessary to have consistent policies so as to create sustainable environments for the development of this type. This is a crucial issue, which makes sense in terms of science and practice not only in the short term but in the long one in economic development, environmental protection, public health protection.
Keywords: *Safe vegetable, production efficiency, Hanoi, sustainable development, science and technology*.

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I. INTRODUCTION

Vegetables is one of the indispensable foods in people's daily meals. The vegetable production is one Vietnam's long career, with higher economic efficiency than growing rice and some other crops. However, food safety is a urgent requirement concerned in order to protect human health. Facing the sustainable agriculture development and the legitimate demands of the people on food safety, in recent years, the food safety and sanitation program in general and the safe vegetable production development (RAT) in particular has been deployed in Vietnam, as typified by Hanoi capital.

Hanoi with an area of 3328.9 km^2, is the center of politics, economy and culture of Vietnam. It is also one of Vietnam's major local vegetable areas with a total area of over 9000 ha, of which safe vegetable planting area is over 2000 ha, where rich and various vegetable species are planted to meet the needs of the inhabitants for both quantity and quality. [4,5]

In this article, we focus on assessing sustainable development of safe vegetable in Hanoi from 2005 to 2015 on the basis of the analysis of fluctuations in safe vegetable area, yield, production and quality, and also we assess economic efficiency of the safe vegetable production over the periods based on the specific economic indicators; Finally, we propose some feasible orientations and major measures to develop safe vegetable sustainably in Ha Noi.

II. RESEARCH METHODS

2.1. Methods

The theme used the following research methods:

❖ *Method of data collection:* Collecting documents and data on natural, economic – social conditions from agricultural development of Hanoi in recent years and from reports of The Hanoi People's Committee to know the city's orientation of agriculture and the safe vegetable development in period of 2011-2020 and the overall planning of social-economic development in this period .

❖ *Method of field survey and investigation, interview*

During the study, investigation and interviews were done with farmers on safe vegetable production (area, yield, investment ...). Besides, visiting fields is necessary to have an overview about the city distribution of production

models, land use forms and situation, especially areas adopting the safe vegetable production from which we have more grounds to comment on the appropriateness of this model for city agricultural development.
We conducted a survey of 200 households (200 sheets) with prepared sheet by method of convenient sampling. The results provided us with the ground to analyse, synthesize and evaluate the effectiveness of safe vegetable production in Hanoi.
❖ *Method of data processing:* Data processing consists of two stages including primary data processing and secondary data processing. Data processed will be consolidated in form of statistics, charts ... on Microsoft Excel.

2.2. Indicators for assessment the economic efficiency of the production of safe vegetables
❖ **Land use efficiency**

$$GTSX = \frac{Q}{S}$$

Q: The value of goods and services
S: The cultivation area
❖ **Efficiency on capital use (H_V)**

$$H_V = \frac{Q}{V}$$

Q: The value of goods and services
V: Total of investment capital for production in that year
❖ **Efficiency of investment ($H_Đ$)**

$$H_Đ = \frac{A}{V}$$

A: Profits earned in a year production

III. RESULTS AND DISCUSSIONS

3.1. Overview of research area
Hanoi with the area of 3328.9 km^2, is located in the North West of the Red River, the latitude from 20° 54 ' to 21° 23 and the longitude from 105° 44 ' to 106° 02 '. It is bordered by the provinces of Thai Nguyen, Phu Tho and Vinh Phuc in the North; Hanam and Hoa Binh in the South; Bac Giang, Bac Ninh and Hung Yen province in the East, and Hoa Binh province in the West.
Hanoi's terrain is gradually lower from the North to the South and from the West to the East. Three quarters of its natural area is plain with the average height of 5-20m above sea level. The plain extends from the West of the Black River, is located along both sides of the Red River and the tributaries of the other rivers. In general, Hanoi has a flat terrain, with two low-lying areas characterized by low-lying plains, including My Duc (in the dam, the river bank of Day river) and the areas of Ung Hoa, Thuong Tin and Phu Xuyen.
Hanoi's relatively fertile, flat land is advantageous for production, and suitable for high-quality intensive agricultural system development, with an abundance and diversity of crop structure. The short-term crops can be cultivated in many crops per year, with high productivity and product quality.

3.2. Status on safe vegetable sustainable development in Hanoi
3.2.1. Performance and status on area, yield, productivity and quality of safe vegetable
❖ **On term of area:**
Table 1. Status on area, yield, production of safe vegetable of Hanoi City in 2005 – 2015 period

Year	Area (ha)	Yield (ton/ha)	Production (ton)
2005	1996,20	14,71	29.364,10
2006	2125,70	16,26	34.563,88
2007	1930,60	16,63	32.105,88
2008	1995,30	16,36	32.643,11
2009	1995,30	17,55	35.017,52
2010	1515,40	19,93	30201,92
2011	1415,40	19,06	26977,52
2012	1468,30	19,14	28103,26
2013	1523,70	18,29	27868,47
2014	1729,80	19,85	34336,53
2015	2245,30	19,71	44254,86

Source: Hanoi Department of Agriculture and Rural Development

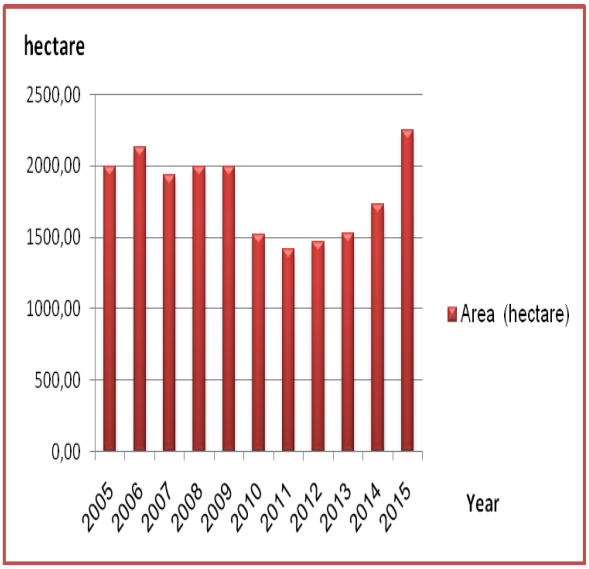

Fig 1. Status on area of safe vegetable

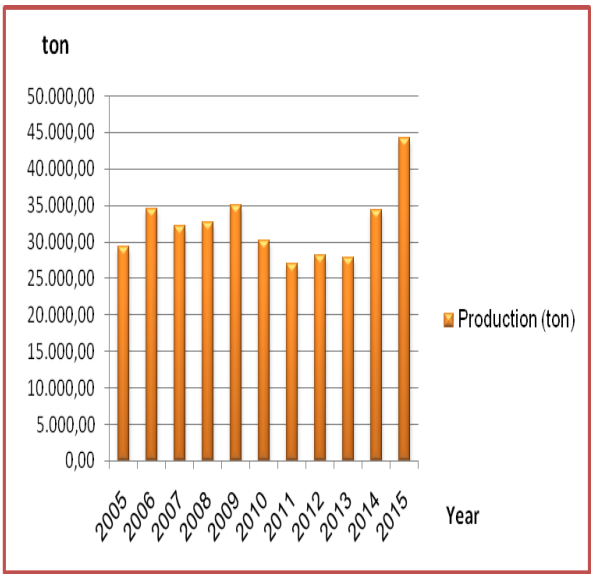

Fig 2. Status on production of safe vegetable

Over the process of investigation, survey and data collection on safe vegetable production in Hanoi, combining with the figures from its agricultural agencies, we have synthesized data on variation of area, yield and production of all kinds to produce safe vegetables. The result shows that the area of safe vegetable production in Hanoi from 2005 to 2011 fluctuated unstably; however, from 2012 to 2015, it increased significantly, from 1468.30ha to 2245.30ha (by 52.92%). The cause of the increase in recent years is from the Hanoi's policies in promoting clean vegetable sources to supply the market to ensure food safety and sanitation for people, as well as to meet their needs. Besides, it also contributes to environmental protection and increasing vegetable producers' income because the price of safe vegetables is much higher than that of common vegetables.

Productivity of safe vegetables in Hanoi is not high but relatively stable because the cultivation under this model is guaranteed by a certain procedure of the Ministry of Agriculture and Rural Development, which mainly concerns on product quality, so the use of chemical plant protection products is limited to the maximum. Low productivity leads to the limitation on safe vegetable production, accordingly not sufficient to supply for Hanoi market, therefore the price of this vegetable is quite expensive comparing to the common one and its consumers often has high economic conditions. This is a limitation and a challenge for the planning of local agricultural development. [10, 17]

3.2.2. Situation of safe vegetable consumption in Hanoi

In fact, safe vegetables is distributed with safe vegetable signs through 3 channels (1) the safe vegetable wholesale market of Van Noi (Dong Anh) with over 100 traders; vegetable sources are mainly from Dong Anh, Soc Son (Hanoi) and VinhPhuc Province; (2) The system of safe vegetable stores and shops in Hanoi; (3) supply vegetable directly to households.

At present, Hanoi has 164 safe vegetable stores affiliating companies, co-operatives and private stores. 152 stores of them were issued with certificate of eligibility for safe vegetable business by Department of Industry and Trade before 2010. The number of safe vegetable selling places increased rapidly in the past years, in 2005 there were 5 places, 25 places in 2007, 83 places in 2012 and 164 safe vegetable selling places in 2015, this number is twice higher than it was three years ago. However, it only the increase in number of stalls in supermarket but in contrast with the new appearance of selling places is the decrease of selling places of farmers due to the increase of location rental fee and other costs whileselling a single vegetable. Some operatives and enterprises have won the contract to supply safe vegetable for the restaurants, hotels and organizations' kitchens (schools, enterprises, etc.) or directly to provide the safe vegetable to each household.

It can be noticed that safe vegetable distribution system still fragment, in retail, has developed, but only meets a part of the needs of producers and consumers. The current state of distribution system actually hinders the sustainable development of the safe vegetable in Hanoi. In our opinion, the main cause of this limitation is due to unstable economic performance factors, safe vegetable business on good source of , the ability to approach customers and profitable levels from shops, cases ... Therefore, measures should be taken to ensure that the output and input, as well as elements of sustainable markets for this production.

3.2.3. Status of safe vegetable production inspection, management and consumption

Inspection on safe vegetable business of commercial sectors did not proactively implement by the too wide management of the commodity in trading industry, lack of staff, lack of professional knowledge on safe vegetable. The survey results showed that: Safe vegetable (SV) stores in the market have been managed by the market management committee and have served well the business regulations on SV. The remaining stores hanging SV selling located in the streets, especially in the small streets or alleys, residential areas, are not under the management of functional agencies and local governments.

❖ *Internal monitoring system in the safe vegetable business - production facilities*

The market investigation showed that the reality of forms of organization of safe vegetable production in Hanoi, internal monitoring systems are deployed well in enterprises, the majority of current cooperatives cannot maintain the technical team any longer, so self-guidance and supervision at the facility are completely overlooked even though this is a form consistent with the current small production. [6]

❖ *Monitoring system of organizations*

Currently in Hanoi, there are 4 certification organizations, but these organizations only monitor the rental areas, therefore there are many restrictions. In the year 2015, SV area supervised by the certification organizations is 115.8 ha accounting for 5.16% of vegetable planting area of the city.

❖ *Current state of equipment system on vegetable quality control and analysis*

Quality testing and analysis equipment are only equipped in the specialized agencies and certification organizations. Inspection content includes rapid analysis of safe vegetable quality and analysis of pesticide residues in plant protection products, but this work has not been implemented, has low efficiency because of lack of equipment as well as professional limitation of human resources.

In summary, management system is relatively logical but lack of smooth coordination and limitation on effectiveness. The low capacity of vegetable quality control and analysis system, lack of equipment, active content are main barriers to be overcome quickly in the next period, in order to promote the development of the safe vegetable program.

3.3. Economic efficiency of safe vegetable production in Hanoi

To assess the economic efficiency of the safe vegetable production in Hanoi, we conducted analysis of the target value and profit/ha over 3 timelines of 2005, 2010 and 2015 based on the annual statisticsfrom the Hanoi Department of Agriculture and Rural Development combining with actual investigation. [4, 8]

Table 2. Production value of safe vegetable in 2005 – 2015 period

Norms	**2005**	**2010**	**2015**
The value of goods and services *(million VND)*	152.693,33	244.635,57	553.185,79
Area *(ha)*	1.996,20	1.315,40	2.645,30
The production value = (1)/(2) *(million VND /ha)*	76,49	185,98	209,12

From the data information, it can be seen that: the value of safe vegetable production in the city increased markedly over the years. In general, from 2005 to 2015 in the whole city, the production value increased from 76.49 million VND/ha to 209.12 million VND/ha, corresponding to 173.40%. This is a significant increase with respect to the safe vegetable production. The level of increase in production value of the safe vegetable production in Hanoi most clearly shown in the period 2005-2010 with 109.49 million VND/ha corresponds with 143.14%. The quite high increase on the value of the safe vegetable production contributed to the rapid increase in safe vegetable planting area of the city after the year of 2010.

Table 3. Profits per hectare of safe vegetable production in 2005 – 2015 period

Norms	**2005**	**2010**	**2015**
Profits *(million VND)*	47.716,67	69.895,88	197.566,35
Area *(ha)*	1.996,20	1.315,40	2.645,30
Profits per hectare = (1)/(2) *(million VND /ha)*	23,90	53,14	74,69

The increase in value of the safe vegetable production leads to the increase of profit in the production process of this type. Specifically, from 2005 to 2015, profits per hectare of this type increased from 23.90 million VND/ha to 74.69 million VND /ha, corresponding to 212.51%; in which, the period of 2005-2010 have the highest increase level of profit per hectare with 29.24 million VND/ha, corresponding to 122.34%. In recent years, profits/ha still tends to increase but slow down.

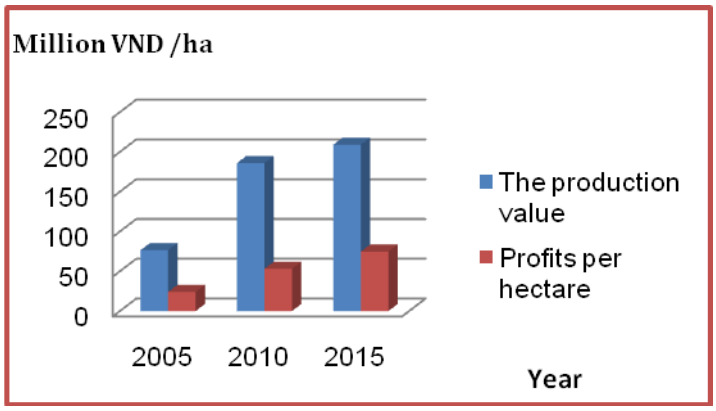

Fig 3. The production value and Profits per hectare of safe vegetable production

Overall, the farmers already know the effective use of their available land for production and business and have created a significant increase of profit. Compared to the country today, profits on hectare of a vegetable production in the city is relatively high. According to statistics analysis, currently, the average nationwide profit/ha of vegetable safety production models reaches from 30-40 million/ha/year. Thus, the profits obtained on 1ha of safe vegetable production in Hanoi is 2 times higher than the country's average one. [7]

Table 4. Economic efficiency of the safe vegetable production

Norms	2005	2010	2015
Efficiency on capital use	1,45	1,40	1,56
Efficiency of investment	0,45	0,40	0,56

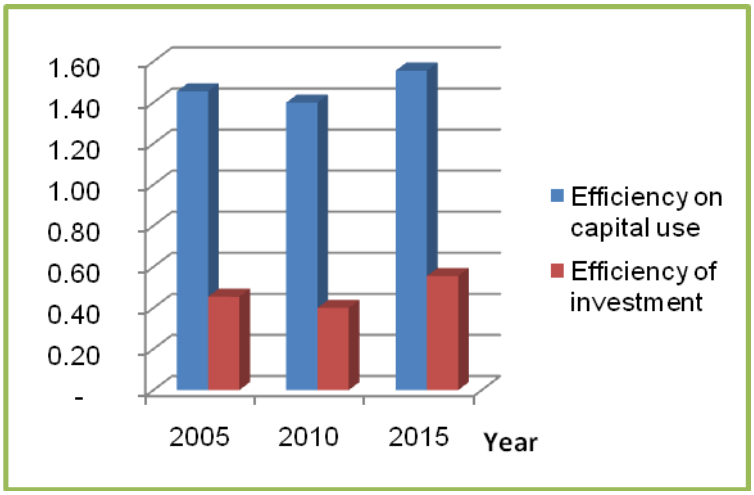

Fig 4. The economic efficiency of the safe vegetable production

Through the above data tables and charts, it can be seen that: Efficiency on capital use and efficiency of investment safe vegetable production cost in Hanoi city in the period 2005 - 2010 decreased slightly, this is because at this stage there were a number of factors with higher input prices such as fertilizers, seeds, etc, however in the period 2010- 2015, the two indicators increased significantly, contributing to improving the economic performance of the farmers. The cause of the strong increase effectiveness of safe vegetable production in Hanoi in recent years is due to the Government's policies of promoting the safe vegetable production development in 2010 and the technical and capital support measures for the production, Furthermore, people focus on more investment in safe vegetable production to create higher economic efficiency. [18]

3.4. Some main solutions on safe vegetable sustainable development in Hanoi

To make the solution for improving the efficiency of safe vegetable production in Hanoi, we have based on the results of the investigation in safe vegetable production and consumption of the city in recent years, besides, we rely on the social-economic and agricultural development orientation of the city in the period 2010-2020 [5,9,19]. Some of the solutions on safe vegetable sustainable development of the city are as follows:

1. Buiding and implementing institutional and incentive policieson development of safe vegetable production and consumption, and then helping farmers with vegetable production and output for products.
2. Reasonable plan of safe vegetable area, investment in infrastructure for the safe vegetable production and consumption to create a production model towards modernization and professionalism.
3. Technical support for the safe vegetable production and consumption such as: Supporting advanced manufacturing skills and proactive thinking process applications to promote rapid expansion of safe vegetable production Viet GAP and GAP; improve self-consciousness of the people through advocacy, community supervisor
4. Completing the forms of production organization - consumption of safe vegetables: the support from the State, particularly from the Hanoi People's Committee and local authorities, promoting inner strength and self-consciousness of the organizations and individuals engaged in the production - business of safe vegetables; Besides, connecting to the expanse of safe vegetable production areas
5. Promoting the safe vegetable consumption such as: Encouraging the development of safe vegetables distribution channels, support on building, maintaining and developing the brand of safe vegetable, conducting marketing activities, improving joint ventures on safe vegetable consumption, controlling and handling violations.
6. Promoting the safe vegetable quality monitoring and management : Enhancing the effect of State management in safe vegetable production- business, strengthening and maintaining effective activity in monitoring forms
7. Informing on safe vegetables: It is necessary to build a website, a regular forum to convey information to farmers and other objects on interest; going into recommends consumers and producers to actively support development programs; Raising the awareness of producers and consumers about the safe vegetable quality.

That is the particular solutions to promote the potential of human resources, land and market demand for the development of safe vegetable production in Hanoi. To carry out these, it is important for the local authorities, the technical staff, businesses and farmers to participate in them. Then, it creates good environment for the safe vegetable production development, ensures socio-economic and environmental sustainability, and brings high and stable income for farmers in this area.

IV. CONCLUSIONS

Through research on the development status of safe vegetable production in Hanoi, we see that, from 2005 to 2015, the safe vegetable area, yield and quality increased but not stably, the infrastructure for the production was weak and just met the requirements of production but the technical support activities were still scattered, after that the support was not extended. The economic efficiency of the safe vegetable production in Hanoi was higher than that in other parts of the country's but was still low, (profit/ha/year was 74.69 million in 2005). To achieve the long-term effectiveness for the development of the safe vegetable production, it is necessary to have consistent policies so as to create sustainable environments for the development of this type. This is a crucial issue, which makes sense in terms of science and practice in not only the short term but the long term in economic development, environmental protection, public health protection.

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