Tec Empresarial
P-ISSN: 1659-2395; E-ISSN: 1659-3359

FACTORS AFFECTING GREEN PRODUCTION IN AGRICULTURE IN HANOI

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Abstract: Green agricultural production is an inevitable trend in agricultural production in Vietnam. This study identifies the factors affecting green production in the agriculture of farming households in some agricultural communes in Hanoi. The author collected data from 235 production households in five districts of Hanoi. The multivariate regression model is mainly used in research to analyze the data. The results show that green agricultural production in the area faces the most significant barriers: the available resources of farm households, the demand of the market, and the price of agricultural products. Meanwhile, state policies and regulations on production processes have less impact.

Keywords: *Green production, agriculture, Hanoi, Vietnam*

1. Introduction

In the context of increasing consumer demand for green agricultural products, green consumption has become an important academic and practical topic (Woo E, Kim YG, 2019; Troudi, H. and Bouyoucef, D.,2020; Barış Armutcu et al., 2023; Thoa Hoang Thi Bao et al., 2023), green agricultural production is an urgent trend for the agricultural industry worldwide. Green production in agriculture (AGP) is considered a model of sustainable development, which includes improved agricultural technology and sustainable production practices, such as less or no tillage technology, use of pesticides, organic pests, manure, soil conservation measures, crop rotation, intercropping, and waste source use (Kassie et al., 2013; Li et al., 2019; Liu et al., 2020). Several studies confirm that green production can improve agricultural production efficiency, reduce environmental pollution, and waste resources, and play an active role in maintaining the competitiveness of agriculture and economic vitality (Yazdanpanah et al., 2014; Zeweld et al., 2017).

Vietnam has a long history of agricultural development and favorable natural and climatic conditions. Along with the development of science and technology, Vietnam's agriculture has made great strides, becoming one of the world's leading exporters of agricultural products, typically ranking third in rice exports worldwide. However, the country's agriculture is still a crude production of products, with many concerns about low quality and low food safety levels, leading to competitiveness with the region and the world. Precepts are low; it is even far behind the world in some areas. Therefore, widely, and comprehensively transforming the agricultural model towards safety and sustainability is urgently necessary. Green agriculture aims to improve the competitiveness of agricultural products, develop technology to process and reuse by-products and waste, stabilize the economy, help farmers have a better quality of life, and protect resources and agricultural ecosystems, ensuring sustainable agriculture on both socio-economic and environmental pillars, contributing to green economic development (Bich Hong, 2022).

In Vietnam, the government has proposed three groups of policies: The first group of regulations directly related to green agriculture includes land planning and use zoning, environmental assessment requirements, land use control, using fertilizers and pesticides, monitoring food hygiene and safety standards, and sanctions for environmental violations; The second group of policies is market tools to help agricultural producers implement environmentally friendly agricultural practices; The third policy group is related to technology and education to raise awareness, including building database systems on green agriculture, research and transfer of green technology, education and awareness raising. However, green production in agriculture is still in the initial stage of transformation and exploration. In Vietnam, people generally have a low awareness of green production policies and measures in practice, which weakens the implementation effectiveness of related policies (Nguyen et al. et al., 2023). There are not many studies on green agricultural production in Vietnam.

2. Research the situation of green agriculture production in the world

When studying farmers' awareness of green production, many studies suggest that green production can reduce environmental pollution, bringing benefits to the safety of agricultural products and human health, as this type of perceived benefit can further influence farmers' green production readiness through positive recognition of perceived value (Mingyue Li et al., 2020; Li et al., 2019; Zeweld et al., 2017). Hurley and Mitchell (2017) also argue that while the farmers understand the benefits of the field and the value provided, they motivated to make economic decisions. Perceived benefits are the primary determining factor, followed by perceived value, and perceived risk can also influence farmers' willingness to implement green production. The results of the research model show that risk perception negatively affects farmers' green production readiness (Li et al., 2020). This result may be because farmers are worried that they need to invest more money and spend more time learning some knowledge and technology while they can earn more money by going out to do other jobs. We can see that farmers perceive high risks in terms of high costs, time, and opportunities. Previous studies have also shown heterogeneity in farmers' risk perception (Meraner & Finger, 2019) and that most farmers are risk averse (Ahmad et al., 2019; Wang et al. events, 2017; Asravor, 2019). However, the results of this study also indicate that the impact of perceived risk on farmers' green production readiness is relatively tiny compared to the perceived benefits and perceived value (Mingyue Li et al., 2020). Because farmers have little or no pressure to implement green production from neighbors, family, or environmental responsibility, farmers need to be more severe and aware of green production. Most farmers depend too much on government support and fail to establish a good sense of self. On the other hand, the policies, or measures to promote green production in agriculture by the competent authorities have yet to achieve the expected effect.

Other research shows that men who are breadwinners will carefully consider the economic benefits and cost risks brought by green production before deciding and often decide to go out to work (He et al., 2016b). The research results of Jiang et al. (2018) said that “external circumstances do not easily influence men because they often decide for themselves .” In addition, with the rapid development of the economy, a large part of farmers' household income comes from part-time work rather than agricultural production (Jiang et al., 2018), which is also one of the main reasons why many family members do not want to participate in green agricultural production to a large extent. The results also show that the area under cultivation has a significant positive effect on the willingness to produce green agriculture, indicating that the larger the area owned by farmers, the greater their willingness to participate. Chaddad’s research explains that more significant agricultural land has the advantage of economies of scale (Chaddad, 2012) and can reduce some intermediaries' potential costs (Fulton, 1995).). These results are consistent with the research results of Yilmaz (2015) and Sharafi et al. (2018), which emphasize a positive and significant relationship between farm size and the application of protective pesticides. This study also included the variable “should join cooperatives” in the study of farmers' willingness to produce green agriculture and used SEM multi-group analysis to check whether the variable modifies the relationship between farmers' perceived value and their readiness (Yilmaz, 2015; Sharafi et al., 2018). Other research shows that compared with the non-participating cooperative group, the variable 'participating in the cooperative group' had a more significant impact on farmers' awareness and green production behavior, which could improve farmers' green production level. This result is also supported by the research results of He et al. (2016a), showing that the willingness of farmers with cooperative membership is 10.71% higher than that of farmers without cooperative members. Cooperatives have an excellent service function because they help compensate for small farmers' shortcomings in absorbing agricultural technology, product sales, warehousing, and logistics services (Liang & Hendrikse, 2016). Cooperatives also incorporate the ecological and environmental impacts of agricultural production into their behavioral decisions, thereby contributing to the protection of farmland and sustainable agricultural development (Pennerstorfer et al. Weiss, 2013; Chen et al., 2018). Farmers will have benefits when producing green agriculture: buying agricultural products at a higher price (Saenger et al., 2013), minimizing some risks, and reducing market volatility (Cai et al., 2019). Although willingness can accurately predict behaviors, the two variables differ (Senger et al., 2017; Morais et al., 2018). Yanakittkul and Aungvaravong (2019) point out that many factors hinder the transformation of readiness behavior into practical action, especially in an ever-changing environment.

Although there is a gap between readiness and behavior, policymakers engaged in green agriculture should recognize the applicability of readiness. On the other hand, different types of farmers, such as experienced farmers, part-time farmers, farmers with arable land are not distinguished (He et al., 2016b).

Research worldwide on green production in agriculture has been conducted quite entirely. However, research on this issue in Vietnam could be much more extensive. This study investigates the factors affecting green production in agriculture in Hanoi and carries the general characteristics of green production in Vietnam.

3. Hypotheses and research models

Knowledge profoundly influences each person's life and society, helping people better understand the world around them and apply knowledge in practice. Knowledge enhances learning, and career opportunities improve the quality of production processes, especially agricultural production. Farmers' awareness of the risks associated with agricultural production and their knowledge of sustainable practices are important factors in implementing sustainable agricultural practices (Walder, P. et al., 2018; Mustafa, G.et al.,2018; Sulewski, P.et al., 2019; Gebska, M. et al., 2020). Raising awareness among traditional farmers about the environmental impact they create could lead to a shift to new alternative farming systems such as organic production (Stockdale, E.A.; et al., 2001)or green production. Research by Zhang et al. (2018) shows that the cognitive level, such as environmental knowledge and responsibility awareness of farmers, affects their willingness to produce green in agriculture. In Tran Quoc Nhan et al. (2021) study, “The higher the education level of the household head, the less likely the household is to apply green production.” Knowledge and awareness have an impact on green production in agriculture. Therefore, the study proposes the hypothesis that ***H1: Knowledge and awareness impact agricultural green production***.

Policies such as agricultural subsidies and infrastructure support impact green production readiness in agriculture (Chen et al., 2017). Similarly, Yanakittkul and Aungvaravong's (2019) research shows that support policies influence farmers' green production decision-making. Regulations on green production in agriculture are applied and managed through legal documents on the management and use of organic and microbial fertilizers in green agricultural production. In the study of Le Thi Thanh Minh and colleagues (2017), the impact of government policies on the decisions of the surveyed subjects was mentioned. Government policies and regulations have an impact on green production in agriculture. Then, the study proposes the hypothesis that ***H2: Government policies and regulations impact agricultural green production***.

Available resources are available resources, capabilities, and factors, which can be divided into physical resources (land, intangible assets, machinery, equipment, means of transport, and other infrastructure).) and human resources (with skills and specialized knowledge to perform jobs and tasks and develop production activities). Along with that are financial resources (assets, cash, investment capital, and other financial resources), information resources, and cooperation resources. In the study of Ho et al. (2017), Laosutsan et al. (2019), and Suwanmaneepong et al. (2016), studies have also examined the influence of resource availability on green production decisions in agriculture. The research results of He et al. (2016a) indicate that the factors of cultivated area, farming experience, and income from agriculture affect the decision to green agricultural production (He et al., 2016a). Research the hypothesis that ***H3: Available resources significantly influence agricultural green production***.

In the context of environmental pollution and climate change becoming an urgent global issue, green consumption and green, environmentally friendly products are given priority. Green production is also considered a standard for high-quality products and services. Consumers are willing to pay more to buy products with environmentally friendly ingredients and "green" and "clean" brands. To meet the demands of consumers, businesses have also chosen green business direction to gain competitive advantage (Ngoc Quynh, 2023) and make high profits (Marr & Howley, 2019). Research the hypothesis that ***H4: Market demand has a positive influence on green production in agriculture.***

Production uses inputs or economic resources (such as labor, equipment, capital, factories...) to provide consumers with goods and services. For green production processes, it is necessary to grow vegetables on high ground, with appropriate drainage for growth, away from waste areas, and soil must not have toxic chemical residues. Regarding irrigation water, use water that is not polluted or treated. When mixing fertilizer, use clean water. Research the hypothesis that ***H5: The production process substantially impacts green production in agriculture***.

The study proposes a research model based on the foundation of synthetic theory and the TPB model of planned behavior (Fishbein & Ajzen, 1975) to identify the factors affecting green production in agriculture worldwide. Some agricultural production areas in Hanoi. In addition, based on the practice in Vietnam, the authors have adjusted the scale by consulting experts, referring to recent research papers on green production, inherited and built for the research model as follows:

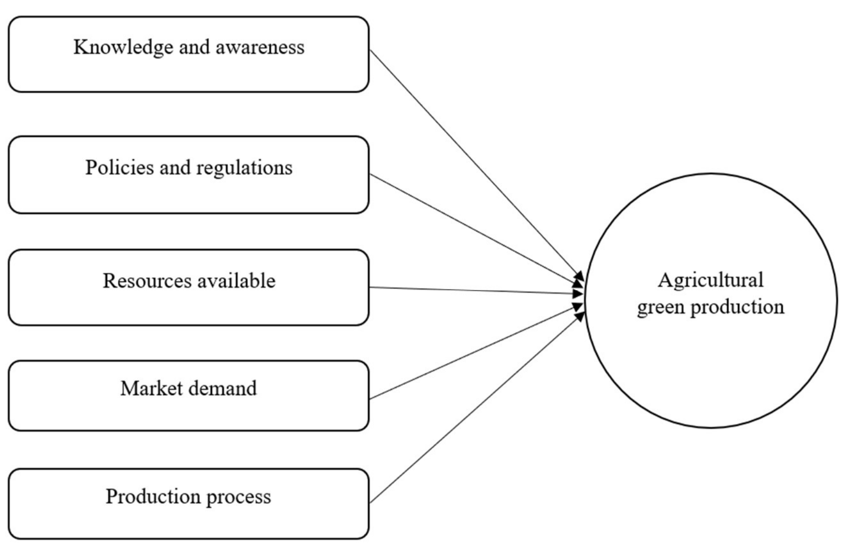

Figure 1. Proposed research model

(Source: Suggested by author)

4. Research results

4.1 Demographic characteristics

Demographic characteristics are factors worth paying attention to because they partly affect the judgments of the people surveyed. The final research sample collected included 235 agricultural production families in Dong Anh District, Gia Lam District, Hoai Duc District, Chuong My District, and Ha Dong District, of which each household carried out one project. Questionnaire, in which the number of people surveyed had a significant difference in the proportion of men (65.1%) and women (34.9%). Of the 235 survey respondents, 46% of survey participants were between 50 and 64 years old, 40% of people were between 35 and 49 years old, and 6.8% of people were between the ages of 20 and 20. up to 34 years old and 7.2% of people over 65. Of the 235 survey respondents, 38.3% of the study sample had a high school diploma; 31.9% had no education; 21.1% graduated from junior high school, 7.2% graduated from college and university, and 1.3% had Master's and Doctoral degrees.

4.2 Reliability of Cronbach's Alpha scale

4.2.1 Measurement scale

The scales used for factor analysis have been used in previous and newly proposed studies and adjusted to suit the research context. A Likert scale with five levels from 1 'strongly disagree' to 5 'strongly agree' was used in this study. The Government Policy and Regulation (PR) scale is described through 5 observed variables from PR1 to PR5, Available Resources (RA) includes four observed variables from RA1 to RA4, Production Process (PP) includes three observed variables from PP1 to PP3, Knowledge and awareness (KA) includes five observed variables from KA1 to KA5; Market demand (MD) includes three observed variables from MD1 to MD3; The dependent variable on agricultural green production (AGP) consists of two observed variables, AGP1 and AGP2.

4.2.2 Check the reliability of the scale Cronbach's Alpha

The results of Cronbach's alpha test (Table 1) include five independent variables: “Government policies and regulations” (PR), “Available resources” (RA); “Production process” (PP), “Knowledge and awareness” (KA); “Market demand” (MD) and one dependent variable is “Agricultural green production” (AGP).

Table 1: Cronbach's alpha test results

STT	Thang đo	Cronbach's Alpha
1	PR	0.697
2	RA	0.816
3	PP	0.693
4	KA	0.770
5	MD	0.688
6	AGP	0.708

4.3 EFA exploratory factor analysis

The results of EFA analysis for five independent variables are presented in Table 2. The results show Government policies and regulations, Available resources, Production process, knowledge and awareness, and Market demand. In the field, the value 0.5<KMO = 0.799<1, and the result of Bartlett's Test of Sphericity has the value Sig = 0.000 ≤ 0.05, showing that the factor analysis is consistent with the research data, the variables observations are correlated with each other in the whole. From the results of the rotated matrix, observed variables: The Government conducts research and develops green agricultural products (PR4) uploaded in all 3 Components 2, 3, and 4, violating the distinction in the matrix rotated with loading factors of 0.538, 0.307 and 0.369 respectively, the difference in loading factors is less than 0.3, so this observed variable was removed from the factor group "Government policies and regulations."

Table 2. Results of KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.799
Bartlett's Test of Sphericity	Approx. Chi-Square	1480.613
	df	190
	Sig.	<.001

After the observable variable does not meet the condition, 21 observed variables are kept for the author to perform the 2nd EFA. The observed variables with the loading coefficient are all greater than 0.5, and there is no case of any variable. Uploading both factors simultaneously with load factors close to each other ensures convergence and discriminant values when analyzing EFA.

Performing EFA analysis, the results are in Table 3. The total variance extracted in Table 6 is 63.241%> 50%: satisfactory; then it can be said that these six factors explain 63,241% of the variation of the data. The Eigenvalues of the factors are all high (>1); the sixth factor has the lowest Eigenvalues of 1,130. These factor loading coefficients are all greater than 0.5, and there is no case of observed variables loading on both factors simultaneously. Therefore, the factors ensure convergence and discriminant validity when analyzing EFA. According to the last rotation matrix table results, the factors are grouped in Table 4.

Table 3. Total variance extracted for independent variables

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.266	26.331	26.331	5.266	26.331	26.331	2.668	13.342	13.342
2	2.080	10.402	36.733	2.080	10.402	36.733	2.205	11.024	24.365
3	1.519	7.595	44.329	1.519	7.595	44.329	2.094	10.471	34.836
4	1.394	6.968	51.296	1.394	6.968	51.296	2.050	10.248	45.084
5	1.259	6.297	57.593	1.259	6.297	57.593	1.915	9.573	54.657
6	1.130	5.648	63.241	1.130	5.648	63.241	1.717	8.584	63.241
7	.886	4.428	67.669						
8	.822	4.112	71.781						
9	.747	3.735	75.516						
10	.713	3.567	79.083						
11	.612	3.059	82.143						

12	.596	2.978	85.121						
13	.514	2.569	87.690						
14	.455	2.274	89.964						
15	.407	2.036	92.000						
16	.376	1.882	93.882						
17	.335	1.677	95.559						
18	.315	1.577	97.136						
19	.296	1.480	98.616						
20	.277	1.384	100.000						
Extraction Method: Principal Component Analysis.									

Table 4. Rotation matrix of independent variables

Rotated Component Matrix[a]						
	Component					
	1	2	3	4	5	6
RA_1	.826					
RA_3	.808					
RA_2	.797					
RA_4	.675					
PA_1		.773				
PA_5		.709				
PA_3		.570				

PA_2		.542				
KA_4			.807			
KA_3			.778			
KA_5			.669			
KA_2			.803			
KA_1			.800			
PP_2				.744		
PP_3				.744		
PP_1				.704		
MD_3					.793	
MD_2					.729	
MD_1					.668	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]						
a. Rotation converged in 5 iterations.						

After analyzing the EFA factor, the author performed a correlation analysis between independent variables. The analysis results are shown in Table 5. Sig value of Pearson correlation of independent variables PR, RA, PP, KA, MD with dependent variable AGP < 0.05. Thus, there is a linear relationship between these independent variables and the AGP variable. The independent variables are positively related to the dependent variable. The strongest correlation exists between RA, MD, and AGP with coefficient r = 0.606; r = 0.608 > 0.

Table 5. Correlations between independent variables

		CS	NL	QT	KT	NC	SX
PA	Pearson Correlation	1	.241**	.301**	.366**	.302**	.416**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	235	235	235	235	235	235
RA	Pearson Correlation	.241**	1	.317**	.265**	.361**	.606**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	235	235	235	235	235	235
PP	Pearson Correlation	.301**	.317**	1	.371**	.362**	.506**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	235	235	235	235	235	235

KA	Pearson Correlation	.366**	.265**	.371**	1	.347**	.560**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	235	235	235	235	235	235
MD	Pearson Correlation	.302**	.361**	.362**	.347**	1	.608**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	235	235	235	235	235	235
AGP	Pearson Correlation	.416**	.606**	.506**	.560**	.608**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	235	235	235	235	235	235

4.4 Linear regression analysis

Carrying out a test of the model's fit against the population for Sig < 0.05. Thus, the constructed linear regression model is suitable for the population. The sample regression results are shown in Table 6.

Table 6. Regression results

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.942	.226		-4.165	<.001		
	PR	.110	.049	.095	2.226	.027	.808	1.238
	RA	.336	.040	.353	8.344	<.001	.814	1.228
	PP	.167	.047	.157	3.580	<.001	.762	1.312
	KA	.289	.047	.269	6.118	<.001	.756	1.323
	MD	.332	.048	.302	6.850	<.001	.752	1.329
a. Dependent Variable: AGP								

The normalized regression coefficient Beta of the independent variables RA and MD is 0.353, respectively; 0.302 has the same effect as the dependent variable AGP. Normalized regression coefficient Beta of the independent variable PR; PP; KA is 0.095; 0.157; 0.269 has a weaker impact than the RA variable, MD, and has the same effect as the dependent variable AGP. State policy factors and market demand strongly influence green production in agriculture in Hanoi. The VIF coefficients of the independent variables are all less than 2, so there is no multicollinearity. Therefore, the multivariable regression model of green production in agriculture is as follows:

$$SX = 0{,}110*PR + 0{,}336*RA + 0{,}167*PP + 0{,}289*KA + 0{,}332*MD + \varepsilon$$

This is consistent with the current reality in Vietnam because the resources of farmer households play a more significant role in agricultural product production, in addition to market needs, including (price-consumer demand). Green, seasonal) also affect agricultural production.

The model's adjusted R^2 value is 0.659 (Table 7), which means the variables in the model include the group of factors belonging to “Government policies and regulations,” “Available resources,” “Process production,” “Knowledge and awareness,” and “Market demand” affect about 65.9% to the promotion of green production in agriculture in Vietnam. The researched influencing factors on green production in agriculture in Vietnam have factors studied based on previous studies, and the author proposes factors during the survey. This is also a study limitation and an expansion direction in the author's following research.

Table 7 Corrected Values R-squared

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.816[a]	.666	.659	.35032	2.308
a. Predictors: (Constant), MD, PR, RA, PP, KA					
b. Dependent Variable: AGP					

5. Conclusion

This study has provided an overview of the influence of factors on green agricultural production. These investigations and surveys are expected to support and provide a scientific document to help authorities, state management agencies, businesses, and localities recognize important factors regarding health and safety to make reasonable decisions to promote agriculture in Vietnam.

What causes difficulties and obstacles to green agricultural production in Vietnam in the current context continues to be a big question. This study has provided some insights into this issue by showing that the main factors hindering green agricultural production are market demand, agricultural product prices, investment finance, and human resources. Thus, most farmers face disadvantages in the agricultural production process that cannot be removed. They need help in the face of changes in market demand, fluctuating prices of agricultural products, a shortage of human resources to operate machinery and equipment, and limited financial resources. The results of this study add that although there are many barriers affecting green production when workers perceive and feel the importance and benefits of green production, they will continue to produce.

Moreover, it increases the scale of green production. The above results may be because the perceived benefits of this approach outweigh the possible risks. In addition, the study also points out the views on Government policies and regulations, Available resources, Production process, knowledge and awareness, and Market demand for green agricultural production among different countries and different groups such as gender, age, and education level.

6. Recommendations

From the essential factors pointed out in the research results, the study provides solutions and recommendations:

For the State

Promoting preferential loan policies, reducing complicated administrative procedures, and strengthening incentive policies to reduce cost risks for farmers is necessary. In addition, it is necessary to encourage large enterprises to actively participate in large-scale green production in practice to compensate for the shortcomings in the scattered agricultural production of farmers, thereby further promoting farmers' readiness to participate in green production. On the other hand, the Government needs to adjust the market order reasonably so that agricultural producers can fully and closely connect with the market and learn what information they need. Agricultural producers can fully and closely connect with the market to adjust agricultural production. Another problem is to adjust the relationship between agricultural production, ecology, and society. The government needs to issue corresponding policies and regulations to meet the requirements of green agriculture development, including controlling strict standards for the use and quantity of pesticides and chemical fertilizers transforming the functional function of agriculture from focusing on agricultural production to multi-functional, life and ecological production. In addition, it is necessary to pay attention to agriculture's ecological, cultural, and aesthetic functions, implement and develop new agricultural functions simultaneously, renew the form of agribusiness, and thrive. Strong links between production, economy, ecology, culture, entertainment and sightseeing, and new green agriculture. Extensive transformation of agricultural production objects. Extensive transformation of agricultural production objects. Extensive transformation of agricultural production objects. In the past, agricultural production was often simply and widely decentralized, causing land resources to be used less effectively. Therefore, agricultural production must shift to a moderate-scale operation; the premise of large-scale land transfer is land transfer, as stipulated in the Government's land transfer document. Each locality must carry out land transfer activities according to their actual conditions, including the scope of land transfer, price, and purpose of use after circulation. Only after the land transfer is done well can the operation of moderate-intensity farming and production regulation be carried out. The new intensive farming model can promote the rational allocation of human resources and land and realize green transformation in agriculture.

For localities:

Localities must popularize, mobilize, support people, and develop policies encouraging people to participate in green production cooperatives. In order to stabilize and improve green production, the Sub-Department of Cultivation and Plant Protection of Hanoi, agencies, and functional units in the district, district, and city connect, introduce consumption addresses, help cooperative members farmers feel secure in production, improve productivity, product quality. In addition, the locality needs to have a mechanism to implement supervision and management to ensure that production is carried out and complies with green production processes and standards.

For the farmer:

(1) First, to convert traditional agriculture to green production, it is necessary to change from today's small, part-time farmers to specialized modern market participants or professional farmers. They are market subjects and participate in market activities. Therefore, they need to cultivate the market participation awareness of new, mature farmers in the face of market risks and challenges. On the other hand, they must have a high degree of stability. Part-time smallholder farmers at the present stage are willing to give up farming and go to the city to work because they have low profits. Therefore, to nurture long-term and stable professional farmers, it is necessary to create conditions for farmers to gain real benefits in farming and be able to keep them on the land. In addition, they must have a high sense of social responsibility, have a modern conception, be educated, technologically savvy, and able to operate, and have responsible behavior towards the ecosystem: environment, society, and future generations. Therefore, educating farmers' consciousness and awareness is very important. To change the traditional individual thinking of farmers, farmers must understand that agricultural production is not only an individual problem but also a problem of society. Only by cultivating this type of professional farmers can they play a leading role in the green transition of agriculture and better promote the green transition of agriculture.

(2) Transforming agricultural production methods and agricultural growth drivers. Traditional agriculture is mainly based on simple and small mechanical production, using input labor, which still needs to meet the requirements of modern agriculture, so in the process of agricultural transformation, pay attention to the conversion of agricultural equipment and infrastructure. Regarding agricultural equipment, deciding which equipment is suitable for local realities is necessary. Furthermore, depending on the economic condition of the farmers, it is necessary to provide financial subsidies in some respects so that the farmers can replace suitable equipment. Then there is agricultural science and technology innovation; agricultural green transformation needs to change agricultural growth due to the input of land and agricultural materials to switch to agricultural science and technology innovation.

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