

Factors affecting the development of green tourism based on organic agriculture: A case study of the Northwest region of Vietnam

Le Van Hung¹, Nam Danh Nguyen^{2*}

^{1,2}Thanh Dong University, Hai Phong City, Vietnam; hunglv@thanhdong.edu.vn (L.V.H.) namnd@thanhdong.edu.vn (N.D.N.).

Abstract: This study aims to identify the key factors influencing the development of green tourism based on organic agriculture in Vietnam's Northwest region. Using a quantitative research design, 362 valid responses were collected and analyzed with SPSS 26 through reliability testing, exploratory factor analysis (EFA), correlation analysis, and linear regression. The findings reveal that seven factors, including tourism resources, tourism development policies, human resources, tourism products, service pricing, facilities and infrastructure, and security and safety, significantly affect the growth of green tourism centered on organic agriculture. The study concludes that improving policy frameworks, enhancing infrastructure, and developing high-quality tourism products are essential to fostering sustainable tourism. The results provide policymakers, local authorities, and tourism enterprises with valuable insights for designing strategies that integrate organic agriculture with eco-friendly tourism, thereby ensuring environmental protection, promoting community participation, and achieving sustainable regional economic development.

Keywords: Green tourism, Northwest region, Organic agriculture, Vietnam.

1. Introduction

In light of increasing climate change, resource depletion, and pressure on the natural environment, the tourism industry urgently needs to transform toward sustainability. One prominent direction encouraged by many countries and international organizations is the development of green tourism, a model that prioritizes environmental protection, promotes indigenous values, and fosters community development. The rise of green tourism not only satisfies tourists' desire to explore and experience the industry but also serves as a practical solution to reduce emissions and adapt to the constant changes in climate during business operations aimed at sustainable economic development. This form of tourism offers numerous significant advantages, utilizing existing resources wisely and effectively, fostering growth alongside environmental protection, safeguarding biodiversity, and promoting cultural heritage values. In Vietnam, this trend is gradually spreading, particularly in areas with diverse ecological potential and cultural identity, such as the Northwest.

The Northwest region of Vietnam, with its majestic natural landscape, cool climate, rich ecosystem, and unique ethnic culture, has all the conditions necessary for developing green tourism. However, in reality, tourism activities here are still mainly spontaneous and lack sustainable orientation, putting significant pressure on the environment and eroding the cultural identity. Meanwhile, organic agriculture, a young yet promising field in the Northwest, has the potential to create added value not only in the agricultural sector but also as an important foundation for green tourism, contributing to the development of an organic agricultural tourism model that both protects the environment and provides sustainable livelihoods for local people. With the trend of consumers increasingly favoring experiences close to nature, safe for health, and friendly to the environment, especially after the COVID-19 pandemic, there is an urgent need to research and develop new tourism models based on green and clean

values. Based on these practical requirements, the study aims to identify factors affecting the development of green tourism based on organic agriculture in the Northwest region. It will contribute to enhancing the scientific basis for the orientation of sustainable tourism development and suggest some important practical implications for local authorities, tourism businesses, and communities in the rational exploitation of natural and cultural potential, thereby linking economic development with the conservation and promotion of environmental values.

2. Literature Review

2.1. The Overview

According to Jafari and Xiao [1], green tourism is a form of natural tourism that is environmentally friendly and does not harm the ecosystem at the tourist destination. Chengcai et al. [2] suggest that green tourism is understood in two ways: in the narrow sense, it involves tourism activities aimed at protecting natural resources and the ecological environment, and it is associated with micro-scale tourism product development. In a broad sense, green tourism serves as a means of developing the tourism economy toward sustainable regeneration, aiming to achieve economic, social, and environmental benefits through the green development of products, consumption, and management.

In Vietnam, the Institute for Tourism Development Research [3] defines green tourism as a development model based on modern and quality growth. It aims to exploit, use, and manage natural resources effectively for tourism development, promote the growth of green tourism services, support green tourism consumption, reduce greenhouse gas emissions, protect the environment sustainably, and adapt to climate change throughout the tourism development process. Additionally, it seeks to address social issues effectively, ensuring that tourism benefits people and communities. Developing green tourism is considered key to establishing a highly responsible tourism industry that ensures sustainable development. The core of this approach is to create green tourism products [4]. Meanwhile, Nguyen [5] believes that a green tourism product must meet criteria such as using environmentally friendly materials, providing safe solutions for both the environment and community health, reducing environmental impacts during use, and contributing to the long-term protection and sustainable development of cultural values and natural landscapes. According to Do et al. [6], green tourism promotes the responsible use and exploitation of natural resources to minimize negative impacts on the human environment. This approach aims to preserve cultural values, heritage, and natural landscapes while raising tourists' awareness of environmental protection. Studies by Batta [7], Sanjaya et al. [8] and Cao et al. [9] suggest that green tourism can be understood in various ways, often being associated with terms like rural tourism, eco-tourism, sustainable tourism, nature tourism, and community tourism. However, overall, the perspectives on green tourism are quite similar and are evolving into a common principle for tourism development that aligns with protecting the natural environment. In this study, green tourism is defined as a form of tourism development that offers environmentally friendly products and services, built on existing foundations and emphasizing the preservation of ecosystems while protecting and promoting the unique cultural heritage of local communities.

With the benefits of fertile soil and a cool climate, organic agricultural production is the focus for many businesses and cooperatives in the Northwest region. People are increasingly aware of the importance of green and clean production methods, consistently using organic fertilizers in their fruit and vegetable gardens. They no longer prioritize sheer productivity but rather place a greater emphasis on product quality. Furthermore, the growth of organic agriculture serves as a foundation for supplying clean, safe, and standardized raw materials for OCOP products. These high-quality products, most of which have agricultural inputs, help address the challenges of production and the optimal use of agricultural products with local characteristics, enabling them to compete effectively in the market. The growth of organic agriculture enhances the value of OCOP products, not only providing competitive prices in the market but also serving as a foundation for developing green tourism in the area. With the current policy supporting friendly tourism activities and environmental protection, green tourism initiatives have focused on attracting tourists by implementing programs at farms growing longan,

strawberries, oranges, plums, and grapes in an organic direction that meets VietGAP and GlobalGAP standards. These initiatives include welcoming visitors to experience unique activities that allow tourists to immerse themselves in nature, care for and pick fruits, and enjoy fresh, juicy produce right from the garden. Tourism festivals can be combined with the promotion and consumption of typical local OCOP products, which helps to find sustainable markets for agricultural goods, increases income for local residents, and contributes to the robust development of green tourism as well as the overall economy of the province. Additionally, when visiting the Northwest, tourists can enjoy many unique cultural and artistic performances and folk games from the local community, such as the “*múa xoè*”, trumpet, and flute. They can also savor dishes rich in mountain and forest flavors, including smoked meat, black chicken, local pork, and wild vegetables, all enhanced by distinctive spices such as ma khen, doi seeds, and cham cheo. These experiences create a unique charm that leaves a lasting impression on visitors when they think of this land. Therefore, to take advantage of and promote the available potential for popularizing green tourism, it is necessary to strengthen the development of organic agricultural products linked to regional characteristics, while maintaining and expanding service offerings, addressing deficiencies, and thus enhancing the quality of tourism aligned with environmental protection goals.

If ecotourism emphasizes tourism that focuses on nature, sustainable tourism emphasizes socio-economic development along with cultural and biodiversity conservation, while community tourism highlights the promotion of local cultural values. According to Nguyen [5], green tourism represents the highest, most effective, and comprehensive form of development, integrating all three forms: ecotourism, sustainable tourism, and community tourism. Green tourism not only brings practical efficiency and effectively utilizes resources linked to environmental protection and biodiversity conservation but also highlights the strengths of indigenous culture while contributing to hunger eradication and poverty reduction, thereby improving the lives of many local people. Therefore, to study the factors influencing the development of green tourism toward organic agriculture in the Northwest region of Vietnam, based on inheritance, the group of authors conducted a brief review of some related studies, such as:

The study by Nguyen [10] on factors affecting sustainable ecotourism development in Ca Mau includes eight key elements: human resources, economic resources, environmental resources, infrastructure, cultural and social resources, tourism management policies, inter-regional tourism, and natural resources.

Research by Nguyen et al. [11] indicates that factors such as landscape environment, security and safety, attractiveness, tourism labor quality, and infrastructure directly affect the development of agricultural tourism in Vinh Long province.

Research by Truong and Nguyen [12] on factors affecting the development of agricultural tourism in Phong Dien District, based on data collected from 157 tourists, revealed that six factors, such as safety and security, price, agricultural tourism resources, technical facilities, labor resources, and infrastructure, impact the development of agricultural tourism.

Research by Nguyen and Nguyen [13] on factors affecting the conditions for green tourism development in Ninh Binh has identified seven key elements: tourism resources, tourism human resources, green tourism development policies, green tourism products, the participation of local communities in green tourism development, the green environment, and tourism infrastructure and technical facilities.

Research by Le et al. [14] evaluating factors that affect the development of ecotourism in Phong Dien District, Can Tho City, identified six factors: tourism products, technical infrastructure, safety and security, environmental sanitation, human resources, and service prices.

Research by Nguyen et al. [15] on factors affecting sustainable tourism development related to ethnic cultural identity in the Northwest region of Son La province, conducted through a quantitative analysis of 438 survey samples, have identified eight influencing factors: natural resources, environment,

institutions and policies, cultural identity, regional connectivity, facilities and infrastructure, human resources, and economy and society.

2.2. Analytical Framework

This study provides an overview of related research, complemented by field surveys that gather insights from tourism business managers and engage in discussions with several experts in green tourism activities, ensuring alignment with the research objectives and context. The author proposes a model for the factors influencing green tourism development based on organic agriculture in the Northwest region of Vietnam, which includes: tourism development policies, tourism resources, tourism products, service pricing, tourism human resources, tourism facilities and infrastructure, and security and safety. The proposed research hypotheses are as follows:

H₁: Tourism development policies have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₂: Tourism resources have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₃: Tourism products have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₄: Service pricing has a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₅: Tourism human resources have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₆: Tourism facilities and infrastructure have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

H₇: Security and safety have a positive impact on the development of green tourism based on organic agriculture in the Northwest region of Vietnam.

The analysis framework is

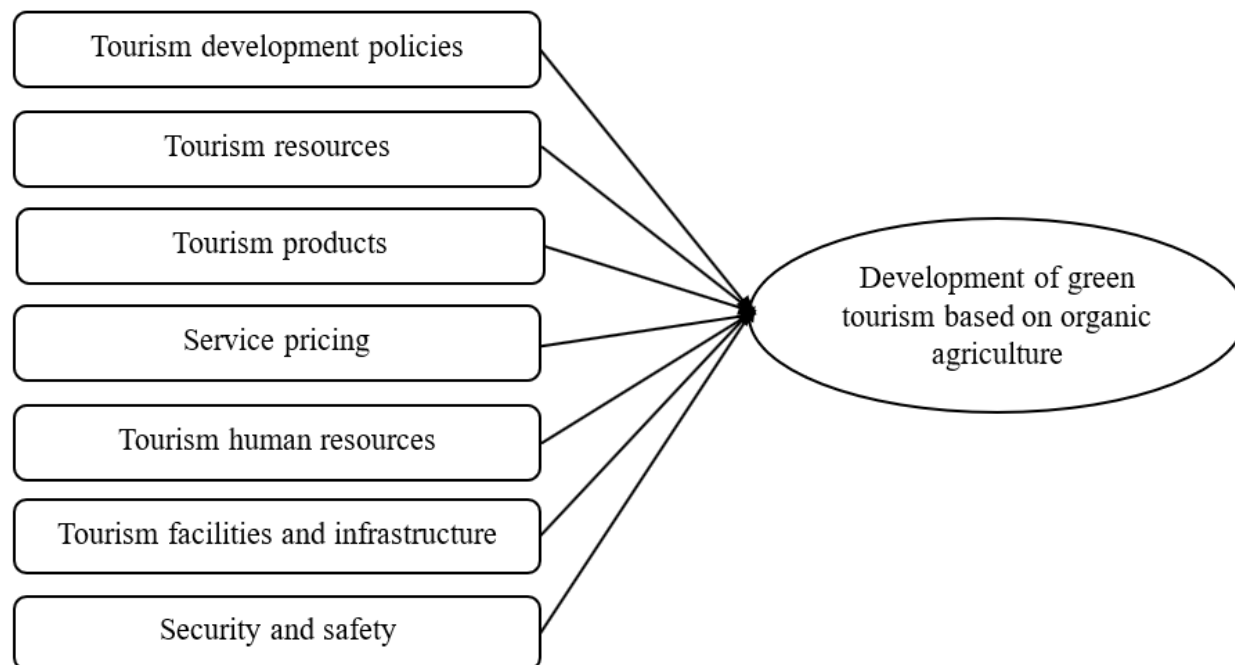


Figure 1.
Analysis framework.

3. Methodology

The preliminary scale was synthesized and selected from domestic studies by Nguyen [10], Nguyen et al. [11], Nguyen and Nguyen [13], and Nguyen et al. [15], which include 34 observed variables corresponding to seven independent factors and a dependent factor.

Before being included in the official survey, the authors discussed the preliminary scale with several tourism business managers in the Northwest region and five experts with extensive experience in the tourism sector to ensure its suitability for the research subjects and context. The results indicated that all participants agreed with the elements of the preliminary scale in the proposed research model; however, some wording of the observed variables needed adjustment to avoid duplication and to express the content clearly and understandably for the survey subjects. The study utilized a 5-point Likert scale ranging from level 1 (completely disagree) to level 5 (completely agree). According to Hair et al. [16], the sample size was determined based on a minimum ratio of 5:1 and an optimal ratio of 10:1. Considering the total number of observed variables in the study was 34, the required sample size was calculated as 340. However, to mitigate the risk of invalid ballots, the authors distributed 385 questionnaires. A non-probability convenience sampling method was employed through direct ballot distribution to the respondents. Residents participated in green tourism activities alongside tourism managers from the Northwest region. The survey was conducted from January 2025 to March 2025. The results yielded 362 valid questionnaires, which were suitable for analysis using SPSS 26 software through descriptive statistics, reliability testing, exploratory factor analysis (EFA), correlation analysis, and linear regression. The research model is expressed in the form of an equation as follows:

$$GT = \beta_0 + \beta_1*DP + \beta_2*TR + \beta_3*TP + \beta_4*SP + \beta_5*TH + \beta_6*FI + \beta_7*SS + \varepsilon$$

In which:

GT (Dependent factor): Development of green tourism based on organic agriculture

The independent variables: (X_i): tourism development policies (DP), tourism resources (TR), tourism products (TP), service pricing (SP), tourism human resources (TH), tourism facilities and infrastructure (FI), security and safety (SS).

β_k : Regression coefficient ($k = 0, 1, 2, \dots, 7$).

ε : Error

4. Research Results

Descriptive statistics indicate that, regarding gender, the proportion of female respondents was 56.1%, while male respondents comprised 43.9%. In terms of age, the workforce aged 30 to 45 represented the most significant proportion (41.4%), followed by those aged 18 to 29 (34.3%) and those over 45 (24.3%). Regarding educational level, the majority of survey respondents held a high school degree or higher (81.2%), with 31.5% possessing a college or university degree and 9.1% having a postgraduate degree. Concerning participation roles, 78.5% of respondents were local individuals directly involved in green tourism activities such as organic agricultural production, accommodation services, cuisine, and local tour guiding; meanwhile, 21.5% were managers working at state management agencies focused on tourism or eco-agricultural enterprises. Additionally, 52.7% of respondents reported having more than three years of experience in activities related to green tourism. Therefore, the research sample ensures the authenticity and reliability of the collected data, reflecting the diversity and suitability to the context of tourism development in the Northwest region, making it appropriate for further analysis.

Table 1.
Reliability and EFA of independent variables.

Sign	Cronbach's Alpha	Corrected Correlation	Item - Total	Cronbach's Alpha if an item is deleted	Factor loadings
Tourism development policies					
DP1	0.819	0.561	0.795	0.823	
DP3		0.509	0.781	0.815	
DP2		0.543	0.752	0.789	
DP4		0.411	0.749	0.764	
Tourism resources					
TR2	0.808	0.616	0.812	0.819	
TR3		0.639	0.804	0.806	
TR1		0.575	0.796	0.790	
TR4		0.571	0.775	0.783	
TR5		0.568	0.762	0.762	
Tourism products					
TP4	0.795	0.582	0.825	0.831	
TP6		0.567	0.814	0.827	
TP1		0.541	0.806	0.815	
TP3		0.530	0.792	0.806	
TP2		0.525	0.783	0.782	
TP5		0.519	0.760	0.774	
Service pricing					
SP3	0.824	0.536	0.781	0.769	
SP1		0.541	0.776	0.752	
SP2		0.533	0.757	0.741	
SP4		0.512	0.742	0.738	
Tourism human resources					
TH1	0.787	0.517	0.820	0.816	
TH3		0.483	0.815	0.784	
TH2		0.472	0.803	0.775	
Tourism facilities and infrastructure					
FI2	0.833	0.571	0.837	0.826	
FI4		0.563	0.820	0.815	
FI1		0.559	0.819	0.807	
FI3		0.534	0.804	0.791	
Security and safety					
SS1	0.801	0.526	0.789	0.819	
SS2		0.519	0.771	0.794	
SS3		0.480	0.764	0.786	
SS 4		0.472	0.732	0.753	
KMO = 0.813					
Bartlett's Test		Approx. Chi-Square		10521.707	
		df		429	
		Sig.		0.000	
% of Variance				80.593	

The analysis results indicate that all independent factors have Cronbach's Alpha coefficients exceeding 0.7, and the total item correlation coefficients are above 0.3. Simultaneously, the Cronbach's Alpha coefficient if the variable is removed is lower than the total Cronbach's Alpha coefficient, demonstrating that all scales possess adequate reliability for inclusion in the EFA [16].

The results of the exploratory factor analysis of independent factors using Varimax rotation and the component extraction method indicate that the KMO coefficient is 0.813, which satisfies the requirement of being less than 1 and greater than 0.5. The Chi-square statistic from the Bartlett test reaches 10521.707 with a significance level of 0.000 (less than 0.05). At the eigenvalue level exceeding 1, factor analysis extracts seven groups of factors with a total extracted variance of 80.593% (greater than

50%), meaning that 80.593% of the variation in the data is accounted for by these seven factors. The loading factors of the observed variables are all greater than 0.5, indicating that the data entered into the exploratory factor analysis meet the requirements [16].

Table 2.

Reliability and EFA of the dependent variable.

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Sign	Cronbach's Alpha	Corrected Item – Total Correlation	Cronbach's Alpha if an item is deleted	Factor loadings
Development of green tourism based on organic agriculture				
GT1	0.841	0.627	0.833	0.829
GT3		0.593	0.825	0.806
GT2		0.514	0.810	0.793
GT4		0.585	0.807	0.787
KMO = 0.805				
Bartlett's test	Approximate Chi-square value			317.852
	df			4
	Sig.			0.000
% of Variance				79.815

Results of the factor analysis of the dependent variable scale show that the total Cronbach's Alpha coefficient is greater than 0.7, the item-total correlation coefficient is greater than 0.3, and the Cronbach's Alpha coefficient if the variable is eliminated is smaller than the total Cronbach's Alpha coefficient, indicating that the scale is reliable. Exploratory factor analysis reveals that the factor loading coefficient is greater than 0.5, and the KMO coefficient is 0.805, both of which satisfy the requirements. The Chi-square statistic of Bartlett's Test reaches a value of 317.852, with the significance coefficient value reaching 0.000 (less than 0.05). An eigenvalue greater than 1 indicates that only one factor is extracted, with the total extracted variance equal to 79.815% (greater than 50%). Thus, the data collected for the scale meet the requirements [16].

Table 3.

Correlation analysis.

	GT	DP	TR	TP	SP	TH	FI	SS
GT	1							
DP	0.715**	1						
TR	0.697**	0.219**	1					
TP	0.733**	0.190**	0.320**	1				
SP	0.689**	0.326**	0.174**	0.343**	1			
TH	0.742**	0.297**	0.228**	0.275**	0.249**	1		
FI	0.660**	0.254**	0.175**	0.315**	0.134**	0.268**	1	
SS	0.707**	0.183*	0.201*	0.264*	0.312*	0.335**	0.219**	1

Note: **. Correlation is significant at the 0.01 level.

*. Correlation is significant at the 0.05 level.

The analysis results indicate a strong correlation between the independent and dependent factors, with significance values all below 0.05. The strongest correlation is observed in the factor of tourism human resources (0.742), while the weakest correlation is found in tourism facilities and infrastructure (0.660). Furthermore, there is no indication of multicollinearity among the independent factors, thereby satisfying the conditions for inclusion in the regression analysis.

Multiple linear regression analysis using the Enter method allows for the simultaneous entry of independent variables to assess their influence on green tourism development.

Table 4.

Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.829	0.810	0.802	0.329	1.875

The regression analysis results indicate that the R value of 0.829 demonstrates a relatively close relationship between the variables in the model. The coefficient of determination, $R^2 = 0.810$, shows that the model's goodness of fit is 81 percent. Furthermore, the adjusted R^2 provides a more accurate reflection of the model's correspondence with the population. The adjusted R^2 value of 0.802 indicates that the independent factors included in the regression analysis explain 80.2% of the variation in the dependent factor, while the remainder is attributed to factors outside the model and random errors. The Durbin-Watson statistic of 1.875 complies with the requirement of being within the acceptable range for hypothesizing that the residuals do not exhibit first-order serial correlation with one another.

Additionally, the ANOVA analysis results indicated that the significance of the F statistic was less than 0.05, confirming the overall suitability of the research model.

Table 5.

Multiple regression analysis.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	SDs	Beta			Tolerance	VIF
1	(Constant)	0.124	0.029		2.296	0.000		
	DP	0.329	0.015	0.351	2.138	0.000	0.718	1.741
	TR	0.351	0.018	0.377	2.211	0.001	0.789	1.882
	TP	0.298	0.023	0.309	2.145	0.000	0.655	1.736
	SP	0.267	0.011	0.288	2.256	0.002	0.721	1.815
	TH	0.306	0.024	0.325	2.188	0.006	0.639	1.790
	FI	0.243	0.019	0.252	2.219	0.000	0.712	1.628
	SS	0.215	0.012	0.236	2.173	0.004	0.760	1.703

Note: a. Dependent Variable: GT.

Testing the research hypotheses reveals that all variables have a significance level of less than 0.05. The variance inflation factor (VIF) of the independent variables presented in the table is greater than one and less than two, indicating no multicollinearity among the independent variables. Additionally, testing the assumption of normal distribution of the residuals shows that the standard deviation (0.985) is close to 1, and the mean (-1.97E-16) is approximately 0. Therefore, the assumption of normal distribution of the residuals when building the regression model is not violated. The scatter plot demonstrates the random dispersion of residual values within a region passing through the 0-intercept line, and the observation points are not scattered too far from the expected straight line, indicating that the assumption of a linear relationship is not violated.

Thus, the research hypotheses are accepted. The seven independent factors exert the same influence on the dependent factor in decreasing order: tourism resources, tourism development policies, tourism human resources, tourism products, service pricing, tourism facilities and infrastructure, and security and safety. The regression equation, according to the standardized Beta coefficient, is as follows:

$$GT = 0.377*TR + 0.351*DP + 0.325*TH + 0.309*TP + 0.288*SP + 0.252*FI + 0.236*SS + \varepsilon$$

The research results show similarities with the studies of Nguyen [10], Nguyen et al. [11], Nguyen and Nguyen [13] and Nguyen et al. [15]. However, this research differs in the level of impact and the order of influence of the seven independent factors due to varying research contexts and subjects. A limitation of this research is its reliance on a basic, inherited model and a convenience sampling method, which only surveys a specific geographical area. As a result, it does not provide true generalizability, and the research model should consider additional factors and other relationships of impact.

5. Conclusion and implications

The development of green tourism has emerged as a principle and a common trend embraced by many countries worldwide, with green tourism products consistently appealing to tourists. This article identifies seven factors influencing the development of green tourism based on organic agriculture in the northern provinces of Vietnam, including tourism resources, tourism development policies, human resources in tourism, tourism products, service pricing, tourism facilities and infrastructure, and security and safety. Building on the study's findings, several implications are proposed as follows:

Firstly, localities must prioritize developing strategies for the sustainable use of natural and cultural resources. The planning of organic agricultural production areas alongside ecotourism spaces should be integrated into the overall tourism development plan. At the same time, it is essential to focus on preserving and promoting the values of natural landscapes, unique ecosystems, and ethnic minority cultural heritages, which are the "identities" that distinguish the Northwest region in the eyes of tourists.

Second, authorities at all levels must issue and implement synchronized policies to promote investment in green tourism models linked to organic agriculture. Priority should be given to tax incentives, credit, land support, and training for farming households, cooperatives, and start-up businesses in this area. Furthermore, coordination mechanisms between the tourism, agriculture, and environment sectors should be established to ensure consistency in planning, monitoring, and sustainable development.

Third, localities need to enhance training in green tourism knowledge, communication skills, guiding abilities, and skills for managing organic agricultural services integrated with tourism for local residents. Simultaneously, there should be a mechanism to attract high-quality human resources to work at key tourist destinations in remote areas.

Fourth, green tourism products should be oriented towards practical experiences, such as visiting organic farms, preparing local dishes with clean ingredients, and staying in traditional, environmentally friendly stilt houses. It is essential to boost creativity, develop unique products, and personalize experiences to match modern consumption trends, while also avoiding monotony and duplication among destinations.

Fifth, localities and businesses need to establish transparent and fair pricing policies that accurately reflect the quality of services and the value of green experiences. It is essential to avoid "overcharging" or inconsistent pricing between destinations, while also applying subsidy or combo mechanisms to stimulate demand during the initial stages of implementing the model.

Sixth, it is essential to prioritize investment in transportation infrastructure for organic agricultural production areas; enhance accommodation quality, environmental sanitation, electricity, water, and internet systems... Additionally, it is necessary to establish green tourism information centers, ecological rest stops, and typical product introduction points to boost destination value.

Seventh, local authorities must establish a system to ensure security and order at tourist destinations, manage the risks of natural disasters and epidemics, and develop safety procedures for agricultural tourism experiences. Furthermore, it is essential to effectively communicate the safety and friendliness of the destination to foster a positive image in the hearts of both domestic and international tourists.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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