

Sustainable Development of Tourism Economy under Agricultural Ecological Environment

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Abstract:

Introduction: Tourism industry is a sunrise industry with broad prospects. The integration of tourism economy and sustainable development under agricultural ecological environment is crucial to the development of ecological economy. This is also an important way to optimise the regional economic and industrial structure and promote the construction of ecological civilization.

Objectives: Based on this, this paper chooses the ecological benefit road in the agricultural tourism planning and design. Starting from environmental protection, this paper combs the internal relationship between natural resources and agricultural production environment, agricultural tourism environment.

Methods: On the premise of not destroying the original ecological environment, this paper creates a natural ecological sightseeing agricultural park, which is conducive to the sustainable use of resources and environment. The test results show that the agricultural tourism consumer groups mainly focus on appreciation, understanding, experience and agricultural natural environment. Ecological harmony can help the sustainable development of agricultural tourism economy.

Results: The model proposed in this paper is helpful to promote the harmonious development of economic, ecological and social benefits.

Conclusions: In this study, the CVM method is used to evaluate the value of public goods with both use value and non use value. The author hopes to provide a basis for macro policy formulation by discussing the practical application and effect of the CVM method in this paper

Keywords: agricultural ecological environment, tourism economy, sustainable development and ecological integration.

INTRODUCTION

The State Council proposed that the promotion of agricultural modernisation and rural reform and development should focus on ensuring national food security and promoting farmers' income increase, and enhance the comprehensive agricultural production capacity¹. Cultivating agricultural modernisation and combining it with tourism are powerful measures to increase agricultural added value^{2,3}. Therefore, under the urgent requirement of solving the "three rural issues", under the guidance of the agricultural modernisation and resource compensation system, actively expanding agricultural functions and establishing a compensation mechanism for resources and ecological environment can effectively compensate for the weakness of the rural economy^{4,5}. Accelerating the establishment of a scientific ecological environment assessment system can effectively promote the sustainable development and utilisation of the ecological environment⁶. Tourism ecological economy organically integrates tourism economic system and ecological system, develops eco-tourism industry under the premise of ensuring sustainable development of ecological environment, and realises the optimal utilisation of tourism resources^{7,8}. Establishing a scientific ecosystem value evaluation system and evaluating the value of resources by combining qualitative and quantitative methods can provide effective theoretical support and technical support for the ecological environment compensation mechanism.

OBJECTIVES

Based on this, this paper chooses the ecological benefit road in the agricultural tourism planning and design. Starting from environmental protection, this paper combs the internal relationship between natural resources and agricultural production environment, agricultural tourism environment.

METHODS

AGRICULTURAL ECO-TOURISM RESOURCES

The agricultural ecological resources are the important foundation for the maintenance of the agricultural ecosystem, and the basic resources for human beings to engage in agricultural production activities and use the agricultural environmental cycle. The agricultural ecosystem established by agricultural ecological resources can form a basic material circulation and transformation system with four elements of agricultural environment, green plants, various animals and various

microorganisms, which establishes an agricultural ecosystem. Agriculture, forestry, animal husbandry, sideline, fishery, bacteria, insects and animal microorganisms in the system belong to agricultural ecological resources⁹.

Agricultural ecological resources serve human beings. Their resources are not only expressed in the form of products, but also used by people in a wider range with their environmental benefits. Agricultural ecological resources have four functions: providing products, regulating environment, culture and supporting ecology, and each function is interdependent and sustainable. Among them, product provision is the primary function of agricultural ecological resources, providing food for human survival; regulating the environment to purify the environment, maintain water and soil, maintain the material cycle of life, and maintain biological diversity¹⁰.

THEORETICAL BASIS AND EVALUATION METHOD OF CONDITIONAL VALUATION METHOD (CVM)

The contingent valuation method is a method to calculate the monetary value of an item in a simulated market by directly asking participants about the maximum willingness to pay for a resource protection or environmental improvement item in the "market" or the minimum willingness to be paid for environmental degradation.

Conditional Valuation Method (CVM) is a method to directly investigate consumers' self-reported preference for the maximum willingness to pay or the minimum willingness to be paid for goods and determine non-use value goods in a hypothetical market when evaluating goods that have no market value and cannot be directly measured by money, especially natural resources with externalities. The academic research on conditional valuation method is earlier.

The conditional valuation method (CVM) solves the indivisible nature of the system and measures the economic value of the evaluation object from the perspective of consumers, which has great advantages over other valuation methods. However, CVM requires that interviewees have a high degree of consistency in their understanding of the interviewed content, and that information bias, personal concept bias, and guidance style bias will have a greater impact on the survey results: content validity, criterion validity, and structure validity. However, relevant experts suggested that many deviations and problems in the application of CVM can be avoided through careful questionnaire design and careful investigation. CVM is still the most effective way to assess the value of resources, culture and the non use value of society. Nowadays, CVM is frequently used in the field of value evaluation and management of tourist attractions, social management of tourism, and tourism management and development, which plays an important value reference role for the sustainable development of tourist attractions.

The following gives an example of environment as public goods to introduce the calculation principle of CVM in detail. Assume that the consumer's personal utility (U) is a function of the state of environmental resources (q), the consumer's personal income (y), and the characteristics of social and economic information (s), that is, $U = U(q, y, s)$. For the protection of agricultural ecological resources in Longji terraced fields, payment makes the state of environmental resources change from q_0 to q_1 , which is an improvement, namely, $q_1 > q_0$. To achieve this improvement, consumers should make corresponding expenditures to maintain the welfare level unchanged. Although consumers are clear about the changes in their utility function due to changes in natural resources, it is difficult to determine the preferences of each consumer in the overall change due to the existence of random factors. Therefore, the formula is usually written as the sum of the deterministic term and the random term of preference:

$$U = V(q, y, s) + \varepsilon \quad (1)$$

In formula (1), ε is the random interference term. Then the utility function of natural resources in two different states q_0 and q_1 is:

$$U_0 = V(q, y, s) + \varepsilon_0 \quad (2)$$

$$U_1 = V(q, y, s) + \varepsilon_1 \quad (3)$$

The random interference terms ε_0 and ε_1 are independent variables.

The CVM questionnaire asks the respondents whether they are willing to pay the maximum amount (A) given in the questionnaire. Since utility U is a strict monotonic increasing function of personal income y , if respondents accept A , then according to the utility maximization theory, the utility difference $\Delta U \geq 0$, namely:

$$V(q_1, y - A, s) + \varepsilon_1 \geq V(q_0, y, s) + \varepsilon_0 \quad (4)$$

When $V(q_1, y - A, s) + \varepsilon_1 = V(q_0, y, s) + \varepsilon_0$,

$$\text{value} = \sum WTP \quad (5)$$

The economic meaning of formula (5) is that the total economic value corresponding to the improvement of environmental resources can be obtained by accumulating the WTP values of all individuals whose welfare is affected in the assessment area guided by CVM.

RELATED CONCEPTS AND RESEARCH REVIEW

In the research of the whole academic circle, due to the confusion between rural tourism and agricultural tourism, the concept of agricultural eco-tourism also confuses agricultural eco-tourism, rural eco-tourism and ecological agricultural tourism. Its concept is the same as that of agricultural tourism, which is based on rural natural environment, agricultural resources, pastoral landscape, agricultural production and local culture, and carries out tourism management by artificially involving structures, so that tourists can achieve the comprehensive purpose of ecological tourism of sightseeing, entertainment, broadening their horizons, increasing knowledge and skills to experience rural scenery. At the same time, agricultural eco-tourism has promoted the development of agriculture, farmers and rural areas, and is an efficient industry. It can be seen that agricultural eco-tourism has both the characteristics of agricultural tourism and the content of eco-tourism. Therefore, agricultural eco-tourism is an ecological tourism that takes advantage of the ecological functions of agriculture.

The research on agricultural eco-tourism abroad is relatively detailed and comprehensive. Foreign countries have used multi-disciplinary crossing, involving field research methods, mathematical statistics methods, etc. not only studied the concept and impact of agricultural eco-tourism, but also studied its management methods and impact on local social culture. It is worth mentioning that foreign studies on the impact of agricultural eco-tourism have paid attention to the attitude perception of residents and the fairness of community participation. At the same time, his research has noticed the details of the development of agricultural eco-tourism, such as the classification of tourism, the characteristics and needs of different target groups, the design and selection of architectural landscape, the price of tourism products and even the design of breakfast and beds. The research on agricultural ecotourism in foreign countries is more systematic and detailed than that in China. Although agricultural eco-tourism started late in China, its development speed in China is very rapid.

RESULTS

CURRENT SITUATION OF TERRACED AGRICULTURAL ECOTOURISM

At present, the tourism development has achieved great economic and social benefits, which has made great contributions to the economic development of villages in the scenic area and the poverty alleviation of the people in the scenic area, and has also driven the economic development of villages around the scenic area. Since the development of Dengshan terrace of Henan, especially after the opening of Scenic Area Highway, the number of tourists and ticket income and other direct economic benefits have been increasing (Table 1).

Table 1. Statistics of number of tourists and ticket income in Dengshan terrace of Henan

Particular year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of tourists (10000)	54.961	79.91	105.225	137.86	186.721	173.484	216.55	257.42	298.9
Ticket income (10 000 yuan)	288.25	564.11	763.64	983	1201	1113.6	1809	1523	2290

In view of the maintenance of Dengshan terrace agricultural landscape, Dengshan terrace of Henan has formulated management measures to strengthen the protection of Dengshan terrace of Henan's agricultural culture and ladder tourism resources, and established Dengshan terrace of Henan Administration Bureau to organise the implementation. At the same time, the scenic spot stipulates to formulate a distribution plan from its operating income every year, and issue terrace maintenance fees to villages in the scenic spot after being approved by the people's government of the autonomous county. The scenic spot draws the ticket income of that year as the terrace maintenance fee of the core scenic spot, and draws the surrounding terrace maintenance fee according to the ticket income; At the same time, Dengshan terraces draw ticket income every year for tourism infrastructure

construction; In addition, the scenic area manages agricultural ecological resources in a unified way. If local farmers do not farm according to regulations, they will be given a deduction of yuan per day for terrace maintenance according to the visual impact.

QUESTIONNAIRE INVESTIGATION

In this study, Dengshan terrace Scenic Area is taken as a case to evaluate the value of its agricultural eco-tourism resources. The definition and accounting method of the resource value have been mentioned above. The focus of the investigation is on the non use value of agricultural ecological tourism resources for tourism purposes. The key of the investigation is to make the interviewees understand the assumptions as thoroughly as possible and voluntarily pay for the non use value of the positive externalities of local resources, so as to determine the total value of agricultural ecological resources of Dengshan terrace Scenic Spot.

According to the purpose and key points of this research, the evaluation of the value of agricultural ecological resources in tourism areas is divided into two aspects: accounting for the non use value of local residents, and the local tourists' views on the non use value of agricultural ecological resources. This field survey questionnaire is divided into residents' questionnaire and tourists' questionnaire.

The two kinds of questionnaires in this survey both include the basic demographic and sociological characteristics of the respondents and their willingness to pay. The first part of the survey is a survey of the sex, age, education level, occupation and average monthly income of the family of the subjects, using a closed payment card questionnaire. In addition, the author refers to international management standards and national standards to divide the age group and monthly income of the family.

The other part of the questionnaire is the core issue of this study: the value evaluation survey of the positive externalities of local agricultural ecological resources. This part first explains the hypothetical market, guides the respondents to reflect on the impact of the agricultural resources, and paves the way for the next survey of willingness to pay, such as fully explaining the current situation of agricultural ecological resources of Dengshan terrace, the necessity of resource maintenance, and the improvement space after resource improvement; Then, the method is used to investigate the maximum willingness to pay of local residents and foreign tourists in Dengshan terrace of Henan.

In the survey of value, the core objective of this survey, as we have found in our earlier survey of social characteristics that the individual objective conditions of local residents and tourists are quite different, and their perceptions of agricultural ecological resources are also different, the author conducted sampling surveys on local residents and visitors to obtain the non use value of agricultural ecological resources of Dengshan terraces. The willingness to pay of the two groups is shown in Table 2.

Table 2. Statistics of willingness to pay

Willingness to participate in the foundation		Willing to participate	Not willing to pay
Resident	Number of people	28	32
	Proportion	45.7%	54.3%
Tourist	Number of people	149	36
	Proportion	80.2%	19.8%

For the interviewees who are unwilling to participate in the hypothetical Terrace Agricultural Ecological Protection Foundation, the author also conducted a survey on the reasons for their unwillingness to pay (See Table 3 for the survey results).

Table 3. Reasons for unwillingness to pay

		Number of people	Percentage	Corrected percentage
Resident questionnaire	No need to take measures to let the terraces take their course	7	11.8%	24.0%
	The quality of terraces has nothing to do with me or I benefit too little	10	16.6%	33. 2%

Tourist questionnaire	Limited economic capacity, do not want to pay more	12	20.0%	39. 5%
	No need to take measures, it is best to let the terraces take their course	2	1.0%	5. 3%
	The quality of the terraces has nothing to do with me. I won't come back anyway	1	0.4%	2. 7%
	Limited economic capacity, do not want to pay more	10	5.6%	30. 1%
	I will choose similar scenic spots instead of Dengshan terraces	6	3.5%	19. 0%
	The tickets for the scenic spot are already very expensive, which should include protection funds	13	7.2%	39.8%

For local residents, many farmers do not benefit from tourism development because of their willingness to live in the location, and their perception only stays in the traditional farming industry. Their economic benefits are also small, and they do not achieve significant improvement in agriculture or economic life, so they are unwilling to pay money; Because of this, some farmers do not feel the real changes brought by local tourism, so they think that the quality of terraced fields has nothing to do with it or that the change of terraced fields in recent years is not significant, and the change of their harvest is not obvious. They think that terraced fields should go with the flow.

For tourists, as it is already expensive to pay 80 yuan to enter the Dengshan terrace Scenic Area, 30.1% of tourists are unwilling to pay more protection funds; Out of the tourists' psychology of seeking maximum utility, 39.8% of them also believed that the tickets should protect the protection fund, and they were unwilling to pay more money. In addition, 19% of tourists will choose to visit other terraces as a substitute rather than pay legacy value or existence value.

In order to study the influence of social and economic characteristics of the survey sample population on willingness to pay and W} value and the relationship between the factors, the author conducted correlation analysis and linear regression analysis on 62 valid resident questionnaires and 188 valid tourist questionnaires. Referring to the general practice of the academic circles for the correlation analysis of CVM research, the author first made a correlation test between the socio-economic characteristics of the respondents and their WTP values (Table 4). It can be seen from Table 4 that the occupation, monthly income and social characteristics of residents are significantly related to WTP, and the age and education level of residents are also related to WTP.

Table 4. Correlation between residents' social characteristics and WTP

Influence factor	Chi-square	df	Sig.	Cramer's V
Gender	0.553	3	0.847	0.827
Age	11.613	15	0.66	0.305
Degree of education	3.994	9	0.747	0.151
Occupation	32.488	26	0.244	0.418
Monthly income	16.523	11	0.157	0.425

DISCUSSION

Although the contingent valuation method (CVM) is so far the only optimal method to know the full use value of environmental public goods, because of its assumptions through the respondents' willingness to pay (WTP) and the unavoidable errors in social surveys, the CVM theory itself is at the focus of academic debate.

In this study, the CVM method is used to evaluate the value of public goods with both use value and non use value. The author hopes to provide a basis for macro policy formulation by discussing the practical application and effect of the CVM method in this paper, but also hopes to lay a research foundation for the conditional value evaluation method and make up for the lack of research direction. Although there are various deficiencies in this study, it is certain that Dengshan terraces have bred its children and grandchildren for generations and provided precious cultural heritage for mankind. Since Dengshan terrace was developed for tourism in 1992, the huge value it has achieved may be impossible to accurately estimate by any method today. As the local government pays more attention to the agricultural ecological resources, the management of the scenic spot is improving, and the people's awareness of environmental protection is gradually improving, the number of local tourists is bound to increase, and its value is bound to be higher.

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