

Research Article

Study on the Impact of Rural Tourism Behavior Development on Ecological Environment in Zhejiang Province

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With the progress of economy, people have more and more leisure time and higher income. More and more people choose rural tourism and experience rural life when they choose to travel. This paper takes Zhejiang rural tourism as an example, based on the theory of complex ecosystem and Butler's theory of tourism destination life cycle. First of all, through literature research, find out the development status of rural tourism in China and elaborate its influencing factors and finally put forward targeted suggestions. Secondly, through on-the-spot investigation, taking the villages in Zhejiang Province as the investigation objects, the relevant information is obtained through questionnaire survey and other methods. Finally, according to the results of literature research and field survey, taking Guzhu village and Jiaxing City in Zhejiang Province as examples, the tourism data over the years show that rural tourism can promote employment, provide multiple jobs, and improve farmers' income. The proportion of rural tourism income in local tourism income has increased year by year. This paper discusses the impact of the development of rural tourism behavior on the ecological environment in Zhejiang Province and tries to find the perfect combination point of the coordinated development of rural tourism and environment.

1. Introduction

Rural tourism is a branch of the development of ecotourism. Now, the development of rural tourism is very popular all over the world, and it has become one of the hot spots of tourism. After the Second World War, the development of rural tourism is heating up rapidly, and the development speed of global tourism is amazing [1]. Tourism once became one of the main driving forces of economic growth after the Second World War. Relevant data show that the number of tourism practitioners has been increasing since the 1980s. According to the statistical yearbook data in 2020, the proportion of economic contribution of tourism industry in the national GDP contribution is rising. The annual growth rate of tourism development is 6%, which makes the development share of World Tourism GDP expand obviously [2]. The gross tourism product has reached 7% of the total value of goods and services. Gradu-

ally, tourism industry has become a real first industry in the world. In terms of tourism development, rural tourism has become an important part of tourism. According to relevant research, the growth rate of tourism in the past 20 years has maintained at more than 28%. The rapid development of tourism industry provides economic support for tourism ecology. Although ecotourism has brought great changes to the economy, the impact of tourism on the natural ecological environment is also increasing, especially in the negative impact. The continuous progress of tourism development has led to the lower carrying capacity of the natural environment. Most of the areas with complex and difficult ecological landscape pattern emphasize economic development and progress, resulting in a large number of landscape destruction [3].

According to the division of resources, China's main ecotourism includes forest, lake, ocean, desert, grassland, ice, and snow tourism. With the development of economy,

tourism has become an indispensable part of people's life and has been recognized by more and more people. Rural tourism has become a tourism mode chosen by a large number of city people [4]. Rural tourism has shown its own characteristics, and there are more and more coordinated development modes of rural tourism and other types of tourism. Most people living in big cities hope to return to the countryside after their economic accumulation. Rural tourism is more and more recognized by people. Rural tourism has become a new healthy lifestyle. Today, with the rapid development of industrialization, the ecological environment problem has become the focus of global attention, and the impact of tourism on the environment can not be ignored. In the development of rural tourism, we must protect the ecological environment and solve the ecological environment problems in the process of rural tourism [5].

Although the research on rural tourism in foreign countries started earlier and there are many research results, the discussion on the concept of rural tourism has never stopped and each has its own focus [6]. Rural tourism is defined as a form of tourism in which local farmers provide accommodation, food, and other specific services for tourists in specific spaces such as farms and pastures to carry out leisure tourism activities [7]. Rural tourism is not only limited to agricultural tourism itself but also includes challenging activities, such as exploration, mountaineering, riding, and hunting, which can be taught to travel and increase experience. In the development process of rural tourism [8], we should pay attention to the bearing capacity of the local ecological environment, carry out appropriate development while protecting, and pay attention to the promotion and application of sewage treatment technology, so as to realize the sustainable development of rural tourism economy and ecology. Compared with foreign research, China's rural tourism research is still in its infancy [9]. Researcher takes the development of rural tourism in Changsha City as an example and believes that in the perspective of ecological civilization, the main mode to realize the development of rural tourism is the development mode dominated by the government, enterprises become the main body of the market, and the community and residents participate actively [10]. Related research puts forward the sustainable development model of low-carbon tourism, which can inherit and protect the rural ecology and folk customs on the basis of actively exploring the composite function of agriculture and effectively solve the problems in the development of rural construction [11].

Based on the perspective of sustainable development, this paper defines the concept of rural tourism on the basis of summarizing the research results of scholars at home and abroad. Firstly, through the review and reflection on the development status and existing problems of rural tourism in Zhejiang Province, this paper combs the experience and practice of better developed areas of rural tourism. Then, it puts forward how to make full use of its existing advantages, break through the development dilemma of rural tourism, embark on the healthy road of sustainable development of rural tourism, and explore a new mode of coordinated development of rural tourism and ecological environment.

2. Materials and Methods

2.1. Research Methods. This paper is based on the understanding of several tourist areas and the familiarity with the development of rural tourism in Zhejiang Province. Through consulting a large number of literature, according to the current situation of the impact of rural tourism development on the environment in Zhejiang Province, this paper analyzes the factors that affect the development of rural tourism and environmental problems and puts forward corresponding countermeasures for the factors that cause environmental impact of rural tourism. Investigation and research is an important method to confirm the reliability of the research content. First, information is obtained through field investigation. Taking Zhejiang Province as the investigation object, important information of the case area is obtained through interviews with operators and tourists, and questionnaires are delivered, which creates favorable conditions for a comprehensive understanding of the situation in the area.

2.2. Research Ideas. Before writing the article, it studies the research status and development background of rural tourism at home and abroad. Based on the literature research results, the paper finds out the development status of rural tourism in China, expounds its influencing factors, and finally puts forward some targeted proposal. The specific flow chart is shown in Figure 1.

2.3. Complex Ecosystem Theory. The ecosystem is the living space of animals, colonies, and other life in nature or certain space [12]. Through the interaction of elements in the environment, the elements and energy are transferred to each other. Over time, these life forms form a system of mutual dependence and interaction in this space. In 1981, Ma Shijun, a world famous ecologist, puts forward the theory of compound ecosystem in the study of the interaction between natural species, as shown in Figure 2. This theory mainly designs three elements: nature, society, and economy [13]. These three elements reflect the mutual relationship in nature. These three elements should pay attention to the natural subsystem. The three elements interact and restrict each other [14].

2.4. Tourism Destination Life Cycle Theory. In 1963, Kristal, a famous German scholar, puts forward the theory of tourism life cycle in his research on the development of tourism destination [15]. Generally, the development and progress of tourism in a region must go through the process of discovery, development, and decline. After several decades, Canadian geographer Butler subdivided the development of tourism destination into six stages based on Christale's research, which are "exploration, participation, development, consolidation, stagnation, and decline or recovery." In today's economic development, people's living standards are getting higher and higher, and tourism has become the main choice for family vacation and leisure [16]. In many areas, too many tourists cause environmental damage and environmental pollution in tourism areas, leading to tourism development in tourism areas entering a recession. However, this recession can be changed by changing the tourism environment and

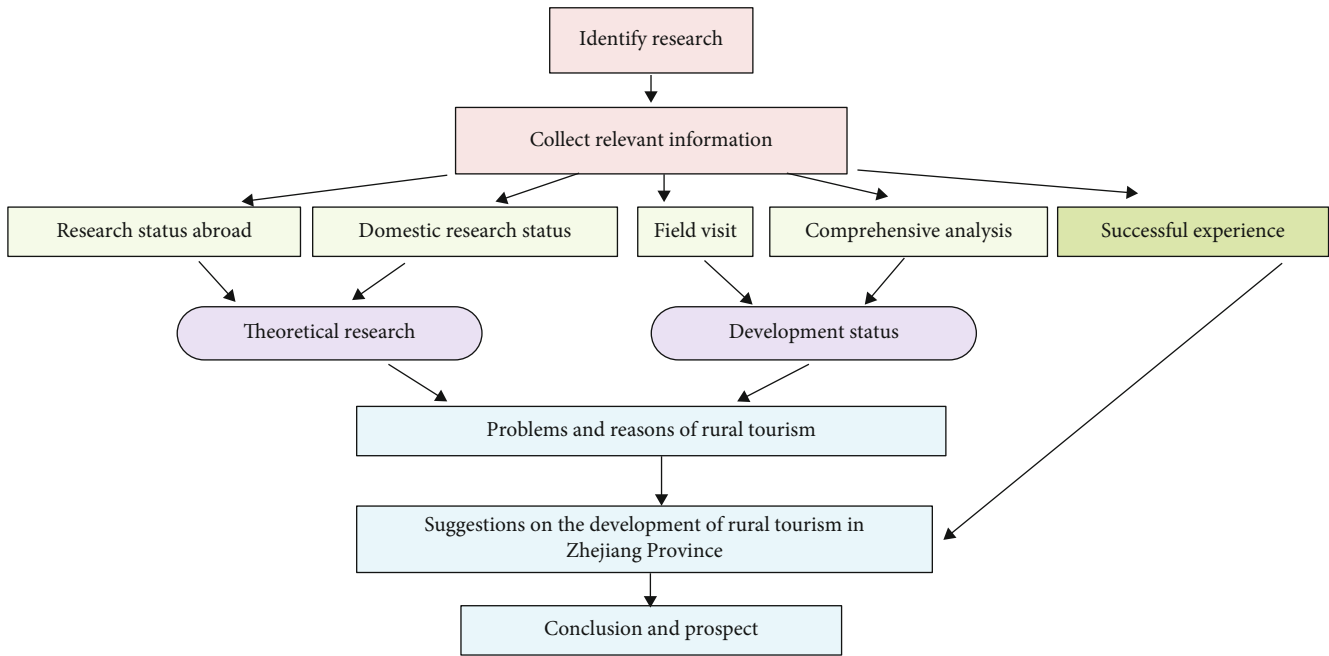


FIGURE 1: The specific flow chart.

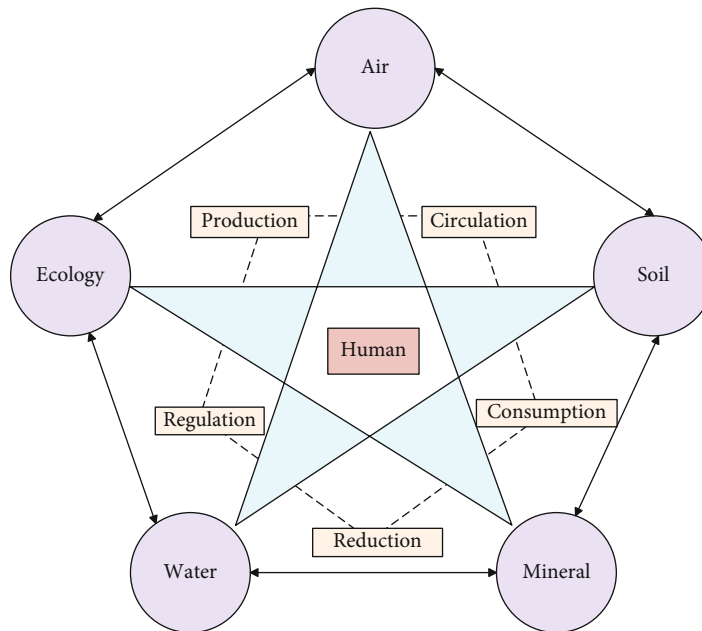


FIGURE 2: Complex ecosystem theory.

strengthening economic construction, in particular, local government investment and support can bring new opportunities to the development of tourism destination (Figure 3).

3. Results

3.1. Development Status of Rural Tourism in Zhejiang Province. After 2002, Zhejiang rural tourism has entered a period of rapid development. The development of rural tourism has brought a lot of economic benefits to tourism towns. Table 1 shows the development scale of Zhejiang

rural tourism in recent three years [17]. Due to resource constraints, not any region can be used to develop rural areas, and the ecological resources of a specific location are limited. The development of rural tourism has a corresponding impact on the ecological environment. With the development of rural tourism towns in specific places, the domestic water consumption is increasing, and the pollution concentration of discharged sewage is also increasing. However, most of the rural domestic sewage treatment facilities can not meet the needs, and there is no complete sewage system, resulting in serious pollution of rural inland rivers or

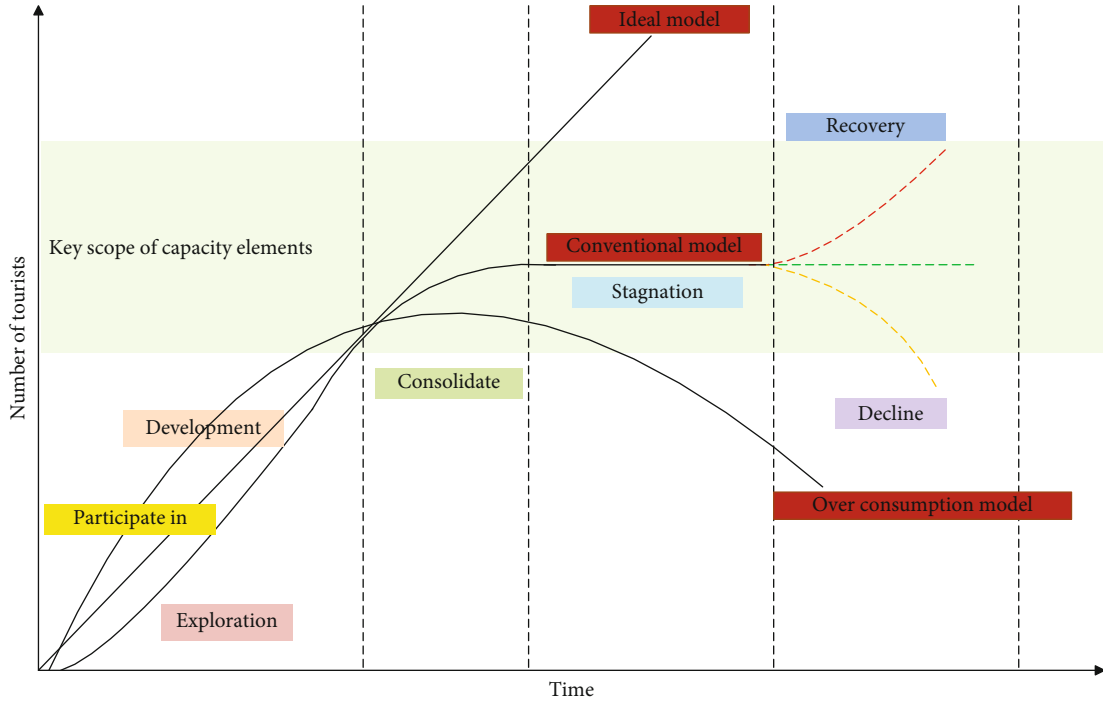


FIGURE 3: Butler's theory of tourism destination life cycle.

TABLE 1: Development scale of rural tourism in Zhejiang Province.

Time (year)	Five star hotel	Four star hotel	Reception (100 million)	Employment (10000 people)	Tourism revenue (100 million)
2018	544	688	2.99	309	2399
2019	578	743	2.87	288	2155
2020	602	801	3.22	355	2670

lakes and downstream water bodies. With the development of rural tourism in many areas, the capacity of environmental treatment of domestic waste and surplus crop waste is limited. Many villages do not have formal waste disposal sites, and domestic waste is discarded at will, which not only affects the image of rural environment but also causes river siltation and water pollution and has a negative impact on normal agricultural production and tourism activities. Rural tourism is generally close to the living area of farmers, which will also cause noise pollution and air pollution [18]. Tourism villages are generally relatively remote, and the environment is relatively quiet. With the arrival of tourists, the quiet of rural life is broken by the engine sound of motor vehicles, the motor sound of pleasure boats, the noise of sound, singing and dancing, and the noise of tourists; it not only affects the leisure quality of rural eco-tourism but also affects the growth and reproduction of animals and plants in tourism areas [19].

3.2. The Impact of Rural Tourism on Ecological Environment in Zhejiang Province

3.2.1. Positive Impact

(1) *To Increase Farmers' Income and Enhance their Environmental Awareness.* Tourism development can bring great help

to the regional economy. The most direct way to develop rural tourism is to increase farmers' income. If farmers have more income, they will improve their ideological and moral quality and gradually seek the best quality of life. Due to the accumulation of knowledge, farmers' awareness of sustainable economic development will be enhanced, and the farmers' awareness will increase investment in environmental protection. Farmers are the builders of ecological civilization in a region and also the disseminators of rural culture. With the enhancement of farmers' awareness of environmental protection, investment in environmental protection will be increased. The better the environmental protection is, more people will be attracted to travel here. A virtuous circle will be formed in the process of local tourism, which will bring sustained economic benefits to farmers [20]. Table 2 shows the per capita income of farmers in Zhejiang Province from 2015 to 2020.

For example, Guzhu village is one of the successful examples of community participation in rural tourism in Zhejiang Province. The village's participation in rural tourism began in the early 21st century. In the past 30 years, the village has made full use of the advantages of landscape resources, actively developed green ecological economy, and successfully realized the transformation and upgrading from "selling mountains and forests" to "selling scenery"

TABLE 2: Per capita income of farmers in Zhejiang Province from 2015 to 2020.

Time(year)	Per capita income of farmers (yuan)	Growth rate (%)
2015	4500	10.2
2016	5200	15.6
2017	5850	12.5
2018	6500	11.1
2019	7250	11.5
2020	7900	9.0

through the development of farmhouse entertainment. It has found a win-win point in economic development and ecological protection [21]. The per capita annual income of the village has increased from more than 3000 yuan ten years ago to about 3600 yuan in 2020. In 2014, it successfully established a rural, open national 4A level scenic spot, and in 2017, it successfully established the first rural tourism industry cluster in Zhejiang Province. Guzhu village is the core area of the gathering area, located in the northwest of Shuikou Township, north of Changxing County, Zhejiang Province, 6.5 km away from Shuikou market town. Covering an area of 18.52 square kilometers, the village governs 14 natural villages and 32 contract groups. It is the most developed village in Shuikou Township and the most concentrated village in Zhejiang Province. At present, there are about 480 villagers living in the village, receiving nearly 3 million tourists every year and creating more than 3000 jobs. In 2020, the average operating income of residential households in Guzhu village is 700000 yuan, of which 50% is more than 1 million yuan, and the operating profit is 260000 yuan, as shown in Figure 4, which shows the income of residential houses in Guzhu village in recent years, and Figure 5 shows the number of tourism employees in recent five years.

(2) *Increasing Local Fiscal Revenue Improves the Enthusiasm of Local Environmental Construction.* First of all, we should improve the ecological protection awareness of local governments, especially the grass-roots rural governments, drive the environmental protection construction of the whole region, maintain the harmonious development of rural tourism and ecological environment, and implement the ecological protection strategy of sustainable development for rural tourism. The development of rural ecotourism can make more surplus rural labor effectively used, constantly optimize the rural industrial structure, and accelerate the growth of rural economy, which is also the current reform idea of the development of rural economy. As Professor Yang Yingfa said, rural tourism is a new form of agricultural structure, which combines agricultural resources with tourism advantages. Rural tourism promotes the development of rural industry, optimizes the original single rural industrial structure, makes full and reasonable use of rural resources, forms the vitality of rural industry, and also forms the competitiveness and vitality of rural areas. The development of rural ecotourism can effectively combine agricultural

resources, ecological resources, and tourism resources, so as to achieve good economic and ecological benefits. The development of rural tourism in Zhejiang Province is more and more mature. Table 3 shows the income of rural tourism development in Zhejiang Province in recent years.

Taking rural tourism in Jiaxing as an example, by the end of September 2020, there are 156 rural leisure tourism villages (spots) in Jiaxing, including 65 villages and 91 spots; 108 characteristic villages (spots) of Nongjiale leisure tourism at or above the municipal level have been established (44 villages and 64 spots), among which 66 provincial characteristic villages (spots) have been established (42 villages and 24 spots). There are 1744 farmhouse operators, including 15 star operators Nongjiale has 10382 direct employees, with a total investment of 4.3 billion yuan, an increase of 48.64%. Figure 6 shows Jiaxing tourism in recent five years; the number of rural tourists in Jiaxing is shown in Figure 6.

The income of Jiaxing farmhouse shows a steady growth trend, and the proportion of annual tourism income in Jiaxing also increases steadily year by year, from 4.5% in 2016 to 8.7% in 2020, as shown in Figure 7. Jiaxing Nongjiale still has great development potential in Jiaxing tourism.

Through the analysis of the total revenue of Jiaxing farmhouse in 2020, we can see that the revenue source of farmhouse is mainly composed of six parts: admission ticket, accommodation, shopping, restaurant, go fishing, and game. Figure 8 shows the proportion of these six sources of income. Catering plays a very important role in the income of farmhouse. Accommodation industry accounts for 19%, and the average price of farmhouse accommodation for tourists is about 100 yuan per night. This price is close to the expectation of tourists for farmhouse accommodation, indicating that this price can not only meet the needs of tourists but also satisfy the operators. Shopping accounts for a big proportion. From both supply and demand, it is found that there is little potential to increase business income by relying on accommodation expenses to stimulate demand. It is an important way to increase business income to attract more tourists through marketing and stimulate tourists' purchase demand by enriching tourism commodities and souvenirs.

3.2.2. Negative Impact

(1) *Tourism Development Activities Bring Material and Energy Consumption.* Tourism development activities will bring a lot of material and energy consumption, such as water, electricity, and food. A large number of tourists flow into the destination, and tourism activities need the local ecosystem to provide services. For some economically underdeveloped areas, it is bound to change the local stock of materials and energy and bring new environmental problems. Currently, the local government needs to invest money and manpower to protect and manage environmental problems. Taking Yunhe County of Zhejiang Province as an example, in recent years, in the villages with dense tourists, the planting varieties and structure are significantly affected

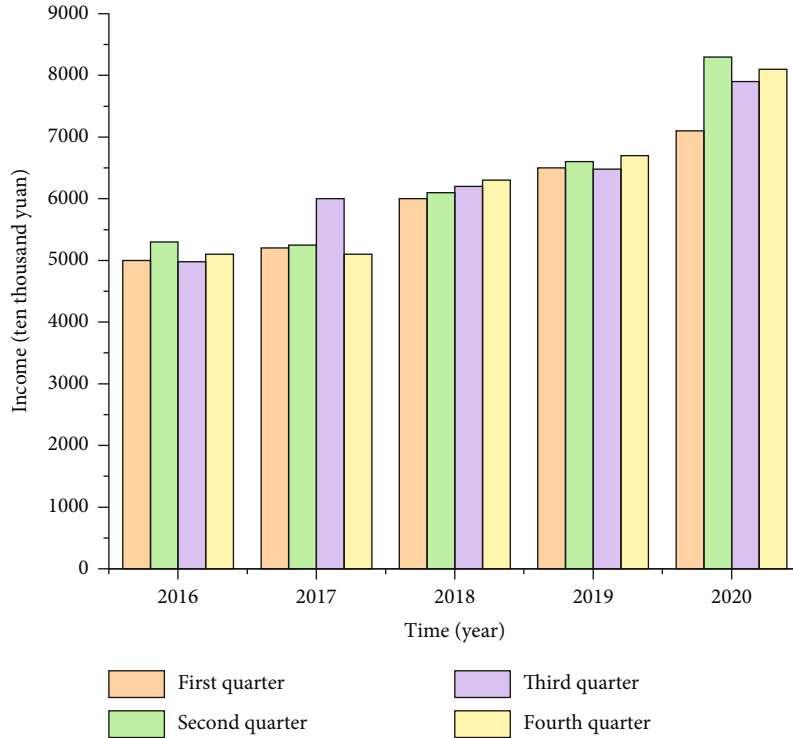


FIGURE 4: Total income of residential houses in 2016-2020.

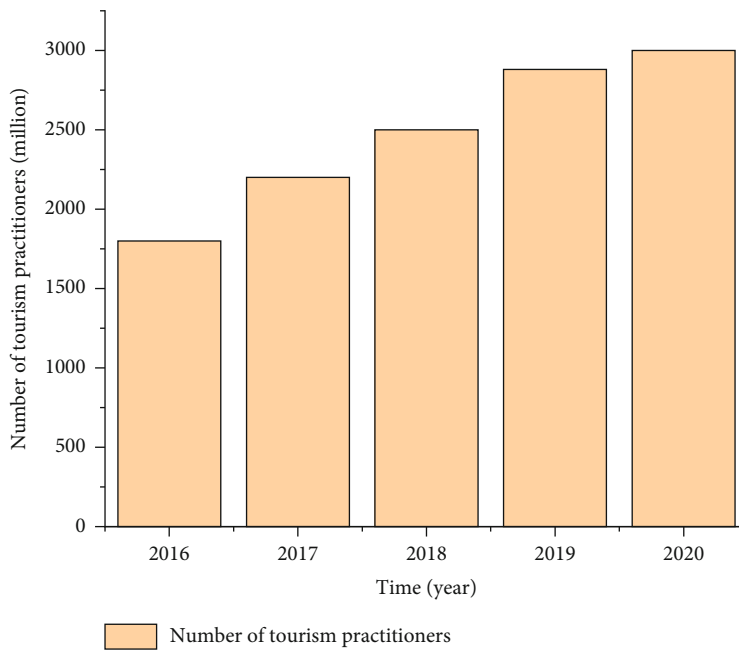


FIGURE 5: Number of tourism practitioners in 2016-2020.

by tourism development, and most of the output is consumed or taken away by tourists. In addition, in order to satisfy the appetite of tourists, rural tourism operators often collect wild vegetables, wild fungi, and even insects to make dishes. Although these species are relatively not scarce and have a large number, excessive collection will also disturb the food chain and damage the ecosystem to a certain extent.

Many traditional villages still use firewood as fuel. In order to receive tourists, local operators will cut down more firewood for cooking or heating.

(2) *Tourism Development Neglects Environmental Impact and Regional Planning.* Many local governments lack of field investigation and research in the development and

TABLE 3: Income from rural tourism development in Zhejiang Province.

Project	2017	2018	2019	2020
Agricultural income (100 million)	150	156	177	260
Nonagricultural income (100 million)	1000	1100	1250	1330
Tourism revenue (100 million)	108	120	135	150
Experience income (100 million)	2	4	5	7
Others (100 million)	20	25	35	40
Construction income (100 million)	80	88	96	108

construction of tourism infrastructure and lack of environmental analysis in the regional planning of tourism, which leads to over optimistic about the development of rural tourism. Many tourist attractions' life service links have caused pollution to the local environment. Blindly carrying out tourism activities will aggravate the damage and destruction to the natural environment and ecosystem. The excessive development and construction of tourism reception facilities will damage the local original natural landscape.

(3) *Tourism Expansion Destroys the Coordination of Natural Environment.* Tourists will produce a lot of organic waste and inorganic waste in the process of tourism. Organic waste refers to the waste containing organic components, such as food residue, melon and fruit skin, vegetable root, vegetable leaf, and human and animal feces produced in the process of rural tourism. Inorganic waste refers to the waste of inorganic components in domestic waste, which can be recycled or recycled, such as waste paper, beverage bottles, and lunch boxes abandoned by tourists. Limited by financial and economic conditions, the local government has no ability to set up garbage collection and treatment stations, so in rural tourism areas; this garbage can be seen everywhere. These solid wastes will breed bacteria, pollute the environment, and have adverse effects on the life and health of local residents.

(4) *The Negative Impact of Tourism Activities on the Environment.* With the development of rural tourism, the number of vehicles and restaurants will be increased. First, with the development of tourism, the number of vehicles that tourists need to take will increase, and the exhaust emissions from vehicles in the scenic area will increase. At the same time, a large amount of floating dust will also affect the air quality in and around the scenic area, so that the original fresh rural air will be less and less. Second, with the development of tourism, the demand for meals and accommodation of tourists will also increase. Coupled with the increase of some entertainment facilities, a large amount of exhaust gas will be discharged, which will also affect the original good air quality of the countryside. Some facilities and systems in the scenic spot may not be perfect, such as some drainage and sewage treatment systems. Domestic sewage used by tourists may be directly discharged into rivers or farmland. At the same time, some tourists may have weak awareness of environmental protection, and they will throw away garbage when they are carrying out water projects or

playing on water. This garbage will seriously pollute the water body of the scenic spot and even lead to eutrophication of the water body, which will eventually lead to the local residents unable to drink these water bodies.

Tourists will produce a lot of organic waste and inorganic waste in the process of tourism. Organic waste refers to the waste containing organic components, such as food residue, melon and fruit skin, vegetable root, vegetable leaf, and human and animal feces produced in the process of rural tourism. Inorganic waste refers to the waste of inorganic components in domestic waste, which can be recycled or recycled, such as waste paper, beverage bottles, and lunch boxes abandoned by tourists. Limited by financial and economic conditions, the local government has no ability to set up garbage collection and treatment stations, so in rural tourism areas; this garbage can be seen everywhere. These solid wastes will breed bacteria, pollute the environment, and have adverse effects on the life and health of local residents.

3.3. Analysis of the Negative Impact of Rural Tourism Environment

3.3.1. *Reasons for Rural Tourism Planning and Management.* A sentence often appears in everyone's mind that everything is difficult at the beginning. Once a thing is done, it will become easier and easier, and more and more people will participate in it. At present, the development of rural tourism in many areas is self-centered and independent. In the process of development, there is no mutual connection, let alone in accordance with the rural tourism development plan. In tourism development, some projects are planned and designed, but in practice, a large number of tourism developers attach importance to scale, quality, and future development. Even some tourism development projects are not carried out in strict accordance with the plan in the process of implementation. In the process of project implementation, only immediate interests are valued, regardless of long-term development, resulting in natural damage in the process of rural tourism development.

3.3.2. *Reasons for Tourists and Managers.* Nowadays, tourists show a large number of uncivilized phenomena in the process of tourism. Tourists and tourism operators lack the corresponding awareness of environmental protection. Many tourists pick flowers and break branches to trample on the grassland at will. At present, most of the experienced people in rural tourism areas are local farmers. Due to various reasons, they have not received good education and paid no attention to environmental protection, and the original natural landscape has been destroyed. Therefore, the lack of environmental protection and the limitation of environmental protection ability of tourists and rural tourism operators are also one of the factors causing the deterioration of rural tourism environment.

3.3.3. *Construction Reasons.* The construction and development of rural tourism cannot be separated from the construction of infrastructure. However, the infrastructure

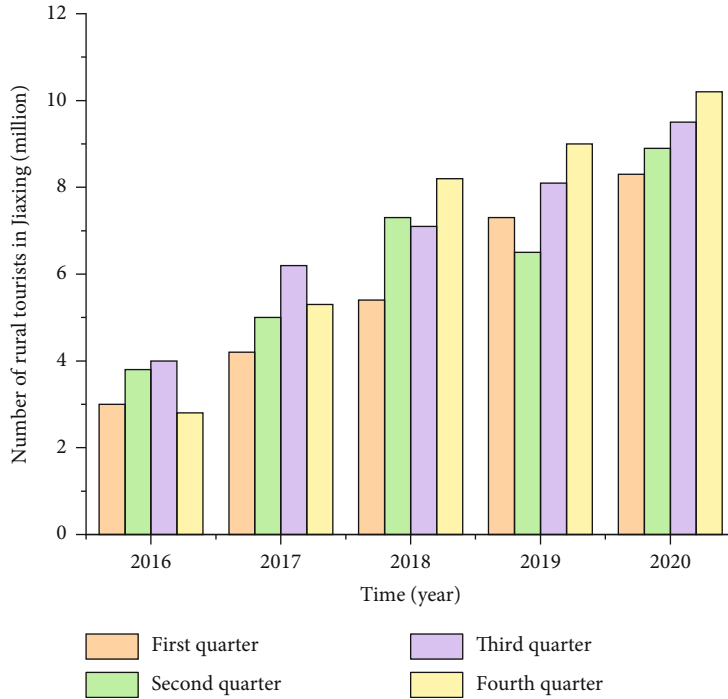


FIGURE 6: The number of rural tourists in Jiaying.

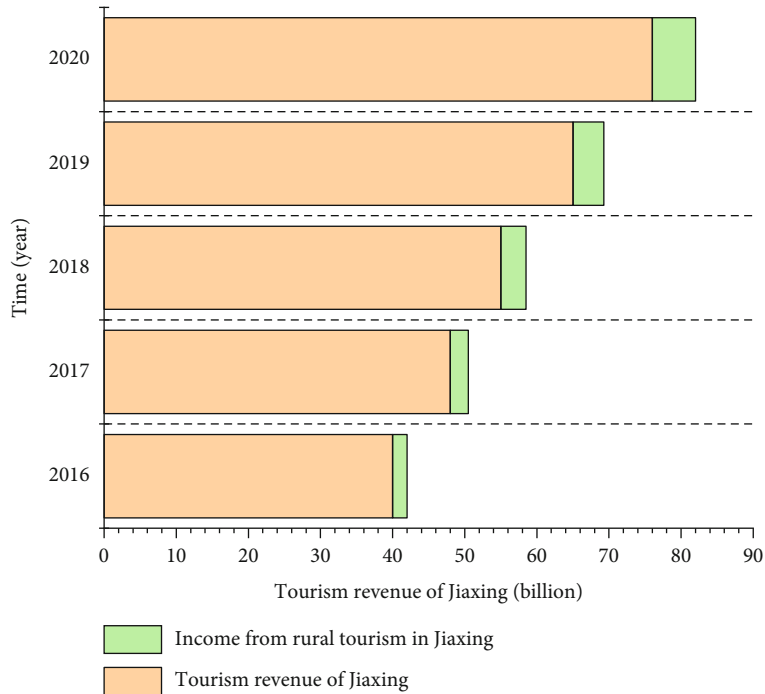


FIGURE 7: The growth of total tourism income and rural tourism income in Jiaying.

construction in the process of rural tourism development in many areas has not been completed in accordance with scientific and reasonable planning. As a result, the infrastructure construction does not match with the local scenery and rigidly imitates the successful experience of other regions. In the tourism area, a large number of landscapes

which are inconsistent with the environment are built, which destroy the natural beauty of the ecological environment. Now, there is a large rural tourism development area, and the excessive construction of villas, cableways, and entertainment facilities has seriously affected the rural nature of rural tourism.

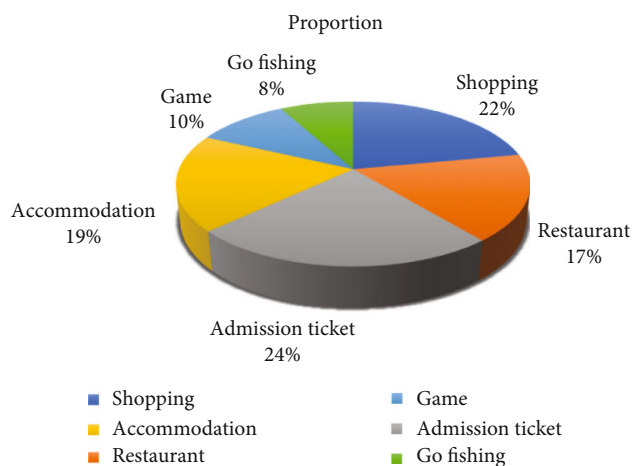


FIGURE 8: The proportion of these six sources of income.

3.3.4. Government Reasons. In the process of rural tourism development in some areas, the government does not provide guidance and lacks supervision and management on the development of tourism operators. These tourism demonstration sites are scattered in various rural tourism areas. Because the government has not carried out good planning in the process of rural tourism development, and the government has no corresponding documents to regulate the management of rural tourism process, resulting in the lack of guidance and supervision in the process of rural tourism development, resulting in various damages to the rural tourism environment. Rural tourism is a new form of tourism development, which plays an important role in the national economic income. However, the government seldom invests in the environmental protection of rural tourism, resulting in the irreparable destruction of many historical culture and tourism resources.

4. Conclusion

- (1) First of all, we should give full play to the functions of the government, establish and improve the rural environmental protection system, increase environmental protection publicity, and improve the awareness of environmental protection. The development of rural tourism is an important activity related to rural economic progress. Many areas regard rural tourism as a project of targeted poverty alleviation. In order to build a good rural environmental protection system in an all-round way, it needs the role of the government. As a government department, it needs to establish a legal guarantee mechanism for rural tourism environmental protection and standardize the establishment and improvement of rural environmental protection system from the perspective of legislation. In the process of rural tourism, the government should persuade and supervise the tourism operators and tourists not to damage the rural environment

- (2) Secondly, it is very important for the government to strengthen the training, guidance and environmental protection concept education of local people in tourism areas. Through these activities, the awareness of environmental protection of rural tourists can be improved. Through these activities, the environmental behavior of tourists can be restrained and strengthened. It is a long-term approach to strengthen the management training of local people. Through the training, they can realize what are the immediate interests and what are the long-term interests. They can realize that predatory tourism development will inevitably lead to the lack of tourism resources. It is helpful to help tourism developers develop tourism better and make tourism developers become participants and beneficiaries of environmental protection. Through the publicity of tourists' awareness of environmental protection, they can consciously restrain their behavior and make them actively participate in the environmental protection of rural tourism. For the farmers engaged in tourism activities, tourists are the interests. The reduction of tourists will reduce the economic interests of farmers. Strengthening the publicity of environmental protection can make the development of rural tourism more scientific

- (3) Finally, we should deal with the protection of environment and resources, advocate green tourism, and guide tourists to develop the concept of ecological consumption. Ecological consumption requires tourists to have a certain sense of ecological civilization, not only to regulate the behavior of tourists but also to emphasize the ecological awareness of consumption. On the other hand, it will encourage more tourism practitioners to adopt green technology and produce green products, so as to form a green industry, meet the needs of society, and promote the development of ecological industry civilization. Therefore, the sustainable development of rural tourism is inseparable from the cultivation of tourists' ecological consumption concept. Therefore, Zhejiang should pay more attention to the guidance of tourists' consumption mode in the process of rural tourism development. We can promote tourists to develop ecological consumption concept by publicizing ecological awareness, formulating legal system and differential pricing

Data Availability

The figures and tables used to support the findings of this study are included in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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