



# Status, Causes and Countermeasures of Environmental Pollution in China's Rural Tourism Development

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## ABSTRACT

Rapid industrialization and urbanization have facilitated the development of rural tourism. However, numerous tourism resources have been destroyed because of poor tourism planning and insufficient advanced environmental pollution control technologies and equipment in numerous rural areas. Thus, this destruction has influenced further rural tourism development. First, relevant literature was reviewed in this study to analyze the status and main causes of environmental pollution in rural tourism development in China. Second, the status of environmental pollution in rural tourism development was summarized, and the causes were analysed from the perspectives of government, rural tourism enterprises, and tourists. Finally, relevant countermeasures were proposed. Results demonstrate that rural tourism is developed with national economic development and per-capital income growth. Environmental pollution in rural tourism development is mainly manifested by water pollution, continuous growth of tourism wastes and poor air quality in rural scenic spots, serious noise pollution surrounding rural scenic spots, and loss of natural value of landscapes. Weak macro-management of rural tourism, rural tourism operators' lack of environmental protection responsibility, and weak environmental protection consciousness of scenic spot communities and tourists are the major causes of environmental pollution in rural tourism development. This environmental pollution on rural tourism development can be controlled by establishing a stakeholder co-governance mode, reinforcing management on the bearing capacity of rural tourism environment, strengthening environmental health management in rural scenic spots, and propagating environmental protection in rural scenic spots. The obtained conclusions can provide important reference for the analysis of the status and causes of environmental pollution in rural tourism development, for establishing a new rural tourism development mode in the ecological environment, and for controlling environmental pollution in rural tourism development.

## INTRODUCTION

The number of tourists in rural areas has steadily increased due to the continuous growth of per-capital income and rapid improvement of rural tourism facilities in China (Fig. 1). The total rural tourism costs have increased annually. However, rural tourism development has caused serious environmental pollution due to tourists' weak environmental protection awareness and poor capability for environmental pollution management in rural scenic spots. Moreover, numerous rural areas have only focused on the immediate interests and have overlooked long-term development. These regions are frequently equipped with poor technologies and equipment for environmental restoration. These conditions have led to a vicious circle, and numerous tourism resources are permanently destroyed, affecting the daily life of local residents to a certain extent, causing irreparable losses, and restricted rural tourism development. The rapid development of rural tourism has also caused multiple environmental problems. For example, the construction of rural highways and large-scale tree felling, have destroyed

the forests and caused considerable damage to forest resources. Noise and waste pollution from construction affects the living of local residents to a certain extent. Despite driving economic and income growths of local residents and solved local employment problems, rural tourism development has also caused marked damages to the local tourism environment and disturbed the daily life of residents to a certain extent. Planning and management of environmental problems in rural tourism development should be investigated to achieve coordinated development between tourism and environmental protection. These factors are conducive to the long-term sound development of rural tourism.

## EARLIER STUDIES

The effect of tourism has been widely discussed by foreign scholars, who conservatively regarded the effects of rural tourism development on economic development and culture. They raised arguments and believed that rural tourism exerted contradictory effects on sightseeing places. In terms

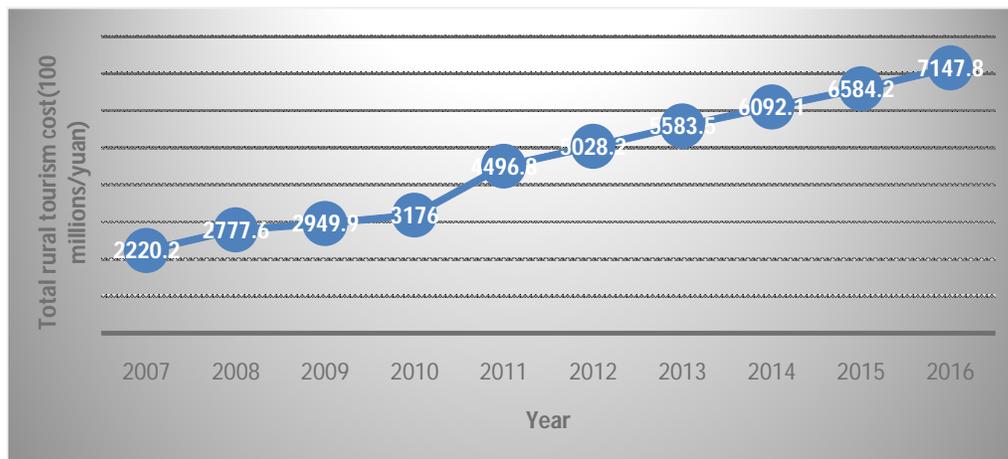


Fig. 1: Total rural tourism costs from 2007 to 2016 (data are from China Statistical Yearbook 2017).

of environmental pollution problems caused by tourism, Lukashina (1996) indicated that fuel energy and automobile transportation in tourism caused environmental pollution in Russia and that environmental pollution caused by tourism can be controlled by legal norms. Mason (2000) believed that tourists caused traffic jams, price inflation, waste pollution, and increasing crime rates in rural areas. Kousis (2000) analysed the dynamic relationship between tourism and environmental pollution from the perspective of social movement. Greiner (2001) investigated the time-dependent effect of environmental pollution on tourism development and indicated that tourism caused environmental pollution and consequently influencing tourism development. Puczko (2000) analysed the actual impacts of tourism industry on Lake Balaton in Hungary from the perspective of sustainable tourism management. Ning (2007) evaluated the water pollution status in Lijiang (China) caused by tourism development. Hasler (2008) believed that high-tension leisure diving caused intensive diving tourism that threatened the coral reef ecosystem in north regions of the Red Sea. Subramani (2012) investigated air pollution caused by waste gas from vehicles in the tourism centre. On the basis of a case study, Katircioglu (2014) investigated the relationship among international tourism, energy consumption, and environmental pollution. Saenz-de-Miera (2014) analysed the effect of tourism industry on climate changes and proved the existence of environmental pollution caused by tourism. Zhang (2015) stated that haze pollution may affect the opinions of several tourists on the tourist spots and believed that the behaviours of a large tourist population may significantly influence the environment. Zhang (2016) discussed the relationship between international tourism industry and environ-

mental pollution by using the provincial data in China. Xu (2017) investigated the interaction between the environmental pollution perception and China's inbound tourism through a VAR model and determined that environmental pollution adversely affected tourism industry in economics. León-Borges (2017) analysed the oil and gas pollution on Caribbean Seabed rock pit in Mexico by using the historical data sequence and clustering analysis of risk method. Raza (2017) conducted an empirical analysis on the relationship between tourism development and environmental degradation in America based on wavelet analysis. Gupta (2018) established a two-department dynamic model for an underdeveloped economic entity to analyze the relationship between tourism development and environmental pollution. On the basis of domestic and foreign literature reviews, environmental protection on rural tourism development in foreign countries was satisfactory. Given the maturity of environmental protection awareness in numerous developed countries, rural tourism does not destroy the natural environment and cause tourism wastes. A combination of humanity and nature can promote the public participation and sense of identity and protect the sustainable development status of local benefits. Developed countries have focused on preventing ecological and environmental pollution caused by rural tourism, mainly manifested by landscape protection, development of project audit, and biodiversity protection. In China, considerable studies focused on rural tourism development mode, rural supply and demands, rural tourism development mechanism, development mode, and tourism subject. On the basis of the literature review, this study summarized the environmental pollution status in China's rural tourism development. The main causes were analysed from the perspectives of government, rural tour-

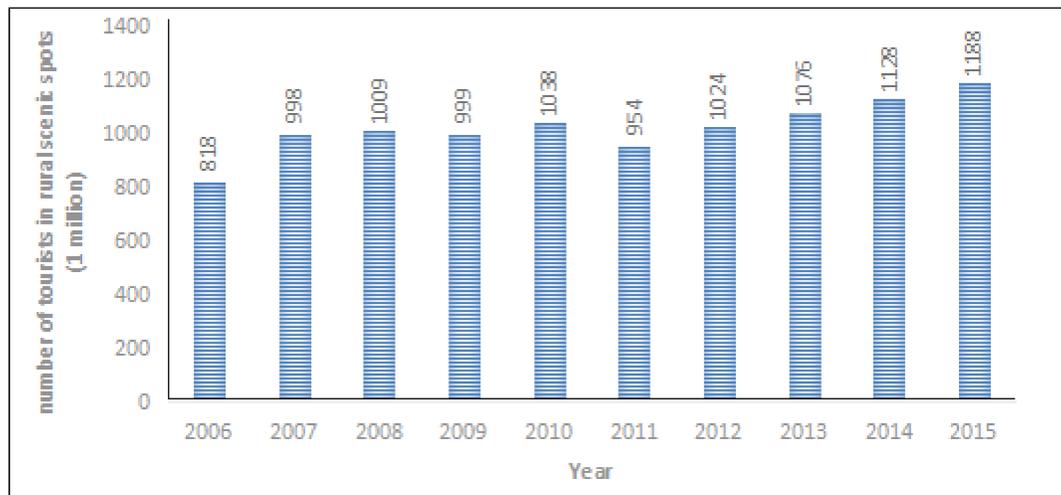


Fig. 2: Number of tourists in rural areas from 2006 to 2015 (data are from China Statistical Yearbook 2007-2016).

ism subjects, and tourists. Several countermeasures were proposed that aimed to provide reference for addressing environmental pollution in rural tourism development.

#### ENVIRONMENTAL POLLUTION STATUS IN RURAL TOURISM DEVELOPMENT

**Water pollution in rural areas:** Although the number of tourists in rural areas has gradually increased (Fig. 2), most tourists are not aware of the protection of water resource. They dispose of several wastes to reservoirs, pools, and lakes; these wastes damage the water resources in rural areas in all aspects. Water quality degrades, aquatic plants decreases gradually, and water becomes muddy, thereby causing a certain degree of water pollution. Thus, the appeal of reservoirs, pools, and lakes to tourists decreases, and income from water scenic spots is reduced. Consequently, a vicious circle of degenerating environment, decreasing tourists, and low income is formed. Moreover, wastewater generation and emission by tourism operators in daily production activities and unreasonable development of rural tourism resources have destroyed the nature of original geographic land-forms, hydraulic conditions, and biological resources in the ecological environment, thereby emphasizing the features of original natural landscapes. Nature in the system is destroyed, resulting in the discontinuity and incompatibility of natural landscapes.

**Continuous growth of tourism wastes in rural areas:** Tourism wastes are basically disposed of everywhere due to the deficient infrastructures in many rural tourism bases. Industrial solid waste pollution caused by the construction of rural scenic spots and solid waste pollution caused by rural residents has become the main sources of tourism wastes. In addition, the places are scattered with tourists because of

unreasonable rural tourism planning, which significantly influenced the aesthetics of scenic spots. In particular, several newly developed rural scenic spots, attracting numerous surrounding tourists with poor environmental protection ability. Numerous tourists indiscriminately dispose of their waste, such as pericarps, waste papers, water bottles, and white garbage bags. Several regions have exploited ecological tourism resources excessively to develop their tourism industry, thereby causing irreversible potential risks to the environment. Tree felling, parking lot construction by removing mountains and flattening lands, and water-course excavations gradually expand watercourses, structural loss of river banks, and serious soil and water losses. These behaviours exert marked impacts on rural lands and deteriorate the environmental health conditions of the entire scenic spots. Furthermore, most tourists do not realize the damage of their behaviour to the environment. Meanwhile, these behaviours may influence the opinion of the following tourists. Therefore, the appeal and reputation of scenic spots decrease substantially, possibly influencing the population of returning tourists to rural scenic spots.

**Poor air quality in rural scenic spots:** In rural tourism, good air quality is one of the advantages of attracting tourists. People who live in fast-paced cities want to breathe fresh air and relax themselves in rural areas. However, air in rural scenic spots is polluted by random emission of waste gases from surrounding township enterprises. Air quality in rural scenic spots is influenced by massive emissions of automobile tail gas and increased dusts and waste gas emissions from local restaurants. With the opening of rural scenic spots to tourists, diesel oil consumption of township enterprises and rural residents increase (Fig. 3), generating a certain amount of waste gases. Random emissions without

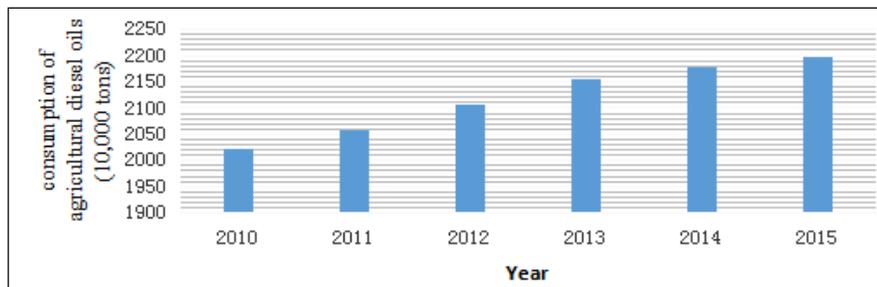


Fig. 3: Consumption volumes of agricultural diesel oil from 2010 to 2016 (data are from China Statistical Yearbook 2017).

certain treatment decrease air quality in surrounding places and thereby influence nearby animals, plant growth, and the physical health of local residents. The reputation of air quality in scenic spots decreases.

**Serious noise pollution in rural tourism development:** Noise pollution exists in numerous rural scenic spots. The quantity of private cars increases annually with good infrastructure conditions of tourism routes (Fig. 4). Given that most tourists prefer travelling with their own vehicles, which provide a convenient and comfortable travel mode, rural scenic spots near cities attract tourists in groups or by private cars, electro mobiles, and motorbikes daily during tourism season. However, these traffic tools result in substantial noise pollution that influence the living environment of local residents and travel experiences of tourists. In addition, rural scenic spots experience noises generated by tourists and traffic tools and serious traffic jams and atmospheric pollution caused by automobile tail gases. In scenic spots, tourists have to communicate mutually and generate loud noises, which influence the daily lives of local residents. Subsequently, noise pollution is formed.

**Loss of natural values on rural scenic spots:** Rural tourism activities influence the natural ecological environment in rural areas. Moreover, rural tourism activities increase the expenses and workload for natural ecological environmental protection and cause irreparable damage to the natural ecological environment. Accommodation of excessive tourists also destroy the natural ecological environment. With the economic development in China, the number of tourists increase annually, tourist density in tourist destinations increases, and tourism routes are highly concentrated. These conditions lead to overcrowding in several famous scenic spots. For example, several rural scenic spots near the cities accommodate excessive tourists relative to their bearing capacity, resulting in considerable pressure on the environmental bearing capacity of the scenic spots. On the one hand, the workload of workers in scenic spots increases and generate negligence in their work. On the other hand, the travel experiences of tourists are significantly

different from the expected value. These findings not only cause considerable impact on the atmosphere in scenic spots, but has also destroyed the natural ecological environment in scenic spots.

### CAUSES OF ENVIRONMENTAL POLLUTION IN RURAL TOURISM DEVELOPMENT

**Weak macro-management of rural tourism:** The government has not come into effect due to the imperfect management system in rural tourism. Rural scenic spots involve various departments and contents, such as rural community development, construction of small towns, agricultural restructuring, tourism development, and protection. These departments and contents require an authoritative department for coordination and management. However, local governments have yet to establish a perfect management agency for uniform coordination and management of rural tourism development. The leading role of the government is incompletely developed. Poor macro-management causes multiple dependent management of benefits in numerous rural scenic spots and mutual shuffling in problem management. Functional government departments are unable to solve the benefits of operators and problems of tourists, thereby influencing the smooth rural tourism development. Moreover, in the absence of policies, regulations, and laws on rural tourism development, local governments cannot formulate corresponding policies and regulations on environmental protection, no laws are followed by operators in business operations, tourists' rights are beyond legal protection, and government administrative departments abide by no rules. Such free development results in spontaneous, blind, and disordered rural tourism development in numerous places, thereby restricting rural tourism development to a certain extent. Numerous rural tourism regions lack overall planning and experience serious problems, such as extensive construction of roads and houses, repeated construction, low-level development, and environmental damages. These behaviours have caused significant waste of resources, finances, human power and materials and have also resulted in low grade of rural tourism products and short life-cycle of

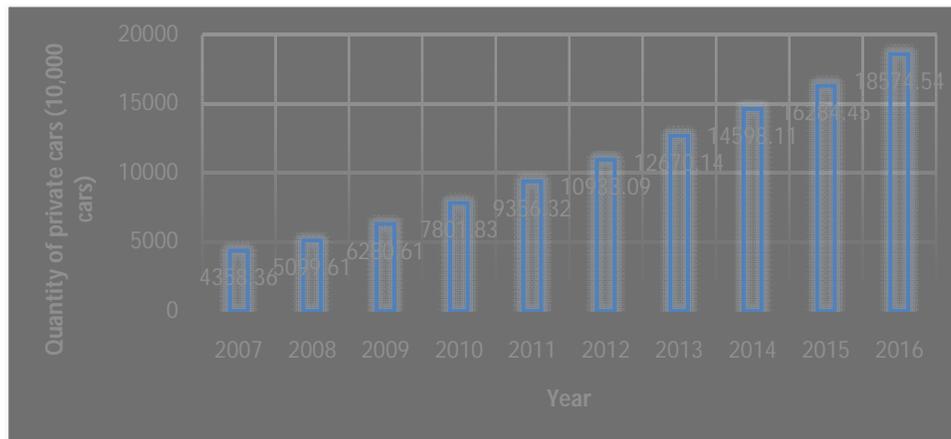


Fig. 4: Quantity of private cars in China (data are from China Statistical Yearbook (2017)).

products, which influenced the sustainable development of rural tourism.

**Rural tourism operators' lack of environmental protection responsibility:** Several subjects in rural tourism development and management believe that tourism is a low-input, high-output labour-intensive industry. They simply believe that natural ecological environment is a renewable, inexhaustible resource. Tourist travel is considered a process of feeling and appreciation that does not affect the natural ecological environment. The tourism market has not been investigated and analysed thoroughly. Moreover, the concept of resource and environmental protection has yet to be established. Rural tourism operators only focus on the immediate economic benefits and overlook long-term benefits; this lack of foresight results in waste of investment, environmental damages, and negative impacts on natural ecological environment. Most rural tourism operators are individuals with no experience in management modes and lack of management over plants and landscapes in rural scenic spots; thus, these operators do not consider plants and landscapes. Meanwhile, rural tourism operators invest on inadequate manpower and materials for managing rural tourism resources, such as water and land resources. They neither monitor water quality regularly nor manage the scenic spots and protect local water resources through scientific means. Several subjects of rural scenic spots randomly dispose of domestic wastes in scenic spots. In terms of management on rural tourism scenic spots, operators present low requirements regarding environmental health, and domestic wastes are randomly disposed in scenic spots, ultimately causing environmental pollution. Moreover, operators possess weak environmental protection awareness and fail to adopt reasonable domestic waste practices. Farm village operators neither control waste gas emissions strictly

and adopt standard waste gas treatment measures nor realize the important role of waste gas in air pollution. In addition, they do not implement appropriate noise control measures in any entertainment activity. Tourists disregard the feelings of local residents and randomly generate various noises. Rural tourism operators implement insufficient effective noise management.

**Weak environmental protection awareness of scenic spot communities and tourists:** Local residents in rural scenic spots are owners of real communities, and rural scenic spots are places in which they have lived for generations. Local residents analyze the actual local situations and can provide good suggestions for tourism development to improve local tourism resources. In the actual tourism development process, local residents from rural scenic spots may adopt several uncivilized and illegal means to acquire considerable income. For example, several residents reconstruct their houses and yards to attract additional tourists. Approaches that destroy the natural ecological environment, such as large-scaled illegal buildings occur and break the original ecological equilibrium. These problems reflect the absence of social participation in natural ecological environmental protection, weak environmental protection awareness of community residents, and lack of awareness of the consequences of natural ecological environmental damages. In addition, tourists may destroy landscape resources, cultural relics, and historic sites and cause environmental pollution because of low cultural quality or lack of expected social morality. Several tourists lack environmental protection awareness and dispose of wastes indiscriminately. Some tourists step on and pick flowers, grasses, and trees, thereby decreasing the categories and quantities of plants. The poor lifestyle of certain tourists affects the excellent traditional culture in scenic spots and changes the inherent social virtues.

## COUNTERMEASURES

**Establishing the stakeholder co-governance mode:** Given their different community participation degrees and benefit distributions, rural tourism operators and non-operators present different perceptions to environmental changes in the community. To achieve the benefit balance between rural tourism operators and non-operators, the government should establish a participation management mode for benefit equilibrium by using equity to handle the relationship among different stakeholders. Rural tourism occupies the resources and environment of non-operators, and non-operators do not gain the corresponding benefits owing to the ambiguous property rights of resources in rural tourism communities. Therefore, capital rating of resources shall be implemented to allow all non-operators to benefit from tourism development. For reducing the income gap among operators and between the operators and non-operators and to reduce the population of migrant workers, the government and tourism enterprises shall provide considerable employment and prior investment opportunities to non-operators. Opportunities to participate in local tourism operation and management shall be provided to residents with certain qualifications.

**Reinforcing management on bearing capacity of rural tourism environment:** As one of the tourism stakeholders, the rural tourism government should completely implement management functions to improve the management on tourism environmental bearing capacity and search for effective management tool and strengthen control over the entire rural tourism development. The rural tourism government should reasonably control the development of natural tourism resources, protect the natural environment, establish a logical construction layout of scenic spots, formulate a good tourism brand image, create a good service atmosphere, shift tourism management mode, reinforce resident management, implement an active quota system on the number of tourists to strengthen alarm awareness on the bearing capacity of rural tourism environment, establish an alarm system, and set up an alarm management organization. Meanwhile, backward infrastructures in rural scenic spots and supporting facilities, including imperfect road infrastructures, overlooking yard greening, backward electricity and discharge infrastructures relative to the overall development of scenic spots, and poor conditions of rooms, kitchens, and toilets, are observed. Environmental pollution frequently causes serious, irreparable environmental damages.

**Strengthening environmental health management in rural scenic spots:** Staff in scenic spots should produce propaganda regarding environmental protection to tourists

after accomplishing their jobs. A sanitation team should be established and equipped with corresponding sanitation tools. Sanitation of regions shall be divided and assigned to different workers. A certain reward and punishment system should be established to protect the enthusiasm of workers. Dustbins should be properly arranged in scenic spots. Additional dustbins and waste handling places should be established in arterial traffic lanes and densely populated places for tourists' convenience of waste disposal and for the convenience of waste processing in scenic spots. In addition to daily normal cleaning, workers in scenic spots should clean numerous invisible dead corners. Conventional examination on places, such as dining halls and dormitories in scenic spots, should be strengthened.

**Propagating environmental protection in rural scenic spots:** Governments should launch several propaganda for civilized sightseeing on newspapers or government websites, create several data and videos about environmental protection, and organize enterprise operators, tourists, and local residents to learn the importance of environmental protection in rural tourism. Lectures on environmental protection to tourists, residents, and farm village operators should be conducted regularly. Leaflets and cards on environmental protection should be formulated. Moreover, rewarded competition on environmental protection should be implemented, and videos and pictures of environmental damages in several scenic spots should be created to attract the attention of tourists toward environmental protection. Oral propaganda regarding environmental protection should be fortified, and tourists should be penalized for violation of rules to increase public attention of the public on environmental protection.

**Advocating green tourism under the perspective of ecological protection:** Local governments should provide the concept of circular economy and advocate green rural tourism to achieve sustainable rural tourism development. The government should establish green rural tourism based on the concept of circular economy. In other words, the government should avoid excessive environmental pollution through scientific planning, reasonable layout, and practical situations and achieve sustainable and ecological circular rural tourism development. This condition requires the implementation of the "protection first and development second" principle in rural tourism development. In terms of architecture, the original typical architectural style should be maintained instead of using armoured concrete high-rise buildings, and local recoverable construction materials should be used. In terms of energy source, green energy sources should be used as much as possible instead of coals and petroleum. In daily life, water and electricity consump-

tion should be reduced by avoiding the use of disposable products, training the workers on green awareness, developing green foods, and constructing green transportation. Moreover, the enterprise image of green tourism should be presented by developing green tourism products and establishing a good harmonious public relationship.

## CONCLUSION

Rural tourism development has increased ecological damage and environmental pollution owing to the lack of institutional design and organizational arrangement and the limited rationality of tourists. In this study, relevant studies are reviewed. Environmental pollution status on rural tourism development in China was summarized and the major causes were analysed. Research results demonstrate that rural tourism is developed with the national economic development and per-capita income growth. Environmental pollution in rural tourism development is mainly manifested by water pollution, continuous growth of tourism waste, poor air quality in rural scenic spots, serious noise pollution surrounding rural scenic spots, and loss of natural value of landscapes. Weak macro-management of rural tourism, rural tourism operators' lack of environmental protection responsibility, and weak environmental protection awareness of scenic spot communities and tourists are the major causes of environmental pollution in rural tourism development. Given that this study focuses on the status and causes of environmental pollution in rural tourism development, a linkage mechanism for economic cost, capital investment system, and subjects for environmental pollution control in rural tourism development should be established, and experiences in environmental protection in rural scenic spots should be investigated.

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