

# Research on the Development and Design of Rural Low-carbon Tourism Products Based on Tourist Experience

Taking Xiaozhou Village in Guangzhou as an Example\*

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**Abstract**—From the perspective of tourist experience, taking Xiaozhou village in Guangzhou city as an example, the author finds that the development of ecological tourism in Xiaozhou village is not perfect, and the protection of ecological environment is insufficient and there is serious commercialization in the village. Such problems lead to the low level of tourists' experience and the urgent need for stakeholders to supervise and cooperate with each other. Finally, the paper studied the development and product designs of low-carbon tourism in Xiaozhou village. This paper will provide some theoretical basis for the study on the sustainable development of rural low-carbon tourism.

**Keywords**—low-carbon rural tourism; low-carbon tourism products; tourist experience

## I. INTRODUCTION

The current "three high + " development model of China's tourism industry has brought great pressure to the environment. The development model of rural tourism led by low-carbon technology and other means is not only conducive to the sustainable development of tourism, but also plays an indispensable role in the recovery and development of rural tourist attractions. In the context of experiencing economic development, the development of low-carbon tourism requires four stakeholders--- tourists, residents of rural communities, governments and low-carbon tourism enterprises participating together, among which tourists occupy a very important position.

The concept of "low-carbon tourism" was first proposed in the BBS report on "moving towards low-carbon travel and tourism" of the world economy forum in May 2009. According to the report, low-carbon tourism refers to green tourism based on low energy consumption, low pollution and low emissions. It is a new tourism mode in the context of low carbon economy and is the goal of the sustainable development of tourism. It is a sustainable development mode through the application of low-carbon technology, the implementation of carbon sink mechanism and the promotion of low-carbon tourism

consumption mode, so as to obtain higher quality of tourism experience and greater economic, social and environmental benefits of tourism. In the same year, Anita Plumarom pointed out in her a paper Change Tourism, not Climate! Time is running out for tourism leaders to clear the air: "The core concept of low-carbon tourism is to achieve greater economic, social and environmental benefits of tourism with less carbon emissions. It is based on the concept of ecological civilization. Domestic scholars such as Ming Qingzhong believe that: the core of low-carbon tourism is to minimize carbon dioxide emissions by developing a low-carbon economy, innovating low-carbon technologies and changing development models in the tourism industry. Low-carbon tourism is a new technological and economic paradigm to alleviate the pressure on the ecological environment. It requires tourism enterprises to optimize the energy usage structure and control pollutant emissions. It requires control at all levels from the source to the end and from the macro to the micro, which is a strategic choice of industrial ecology. This paper argues that low-carbon tourism relies on a series of application and innovation of low-carbon technologies. Through every link of food, shelter, transportation, travel, shopping and entertainment, low-carbon tourism can reduce the CO<sub>2</sub> emissions of tourists' tourism in the process of travel, protect the natural and cultural environment of tourism destinations, and respect the cultural and lifestyle of tourism communities.

Low-carbon tourism is a product of low-carbon civilization. Therefore, low-carbon tourism products are comprehensive products of material products, spiritual products and various tourism services created according to low-carbon concepts and technologies in order to meet the needs of low-carbon tourism activities of low-carbon tourists, or new products formed through low-carbon transformation and innovation of traditional products in the past. Based on the research of scholars at home and abroad, low-carbon tourism products can be defined as all the services that create a series of low-carbon tourism attractions, low-carbon tourism facilities and low-carbon transportation based on the concept of low-carbon civilization to meet the needs of tourists in the process of tourism and promote tourists' low-carbon consumption, so as

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to obtain the maximum economic, environmental and social benefits in the tourism industry. Low-carbon tourism products take low energy consumption, low pollution and low carbon emissions as the standards, and take the protection and improvement of the natural and cultural environment in tourist destinations as the goals. They involve various aspects of tourism activities and contribute to the sustainable development of the tourism industry.

## II. ANALYSIS ON THE DEVELOPMENT OF LOW-CARBON TOURISM

In recent years, the rapid development of China's tourism industry has gradually made it become the pillar industry of the national economy. However, there is a similar "three high +" problem as in the world tourism industry. As tourists' consumption level, form, and requirement continuously improve, tourism industry also has some problems like high energy consumption and high emissions, high pollution problem, causing the destruction and pollution (garbage, noise and water pollution) of the ecological environment (land, rivers, lakes, etc.) Then to some extent, it affects the world's atmospheric environment and ecological environment. For example, according to the 2011 statistical communique of China's national tourism administration, 135 million inbound tourists visited China in 2011, an increase of 1.2 percent over the previous year. The number of domestic tourists reached 2.641 billion, up 13.2% year on year. The continuous increase in the number of tourists leads to the unprecedented destruction of the ecological and cultural environment of tourist attractions. At the same time, the increasing demand of tourists has led to a large number of tourism enterprises with high energy consumption, high carbon emissions and high pollution, which has seriously aggravated the pressure on China's tourism ecological environment. Therefore, developing a global low-carbon economy and reducing carbon emissions to promote sustainable tourism development have attracted worldwide attention. Located in the southeast of Guangzhou Zhuhai district, Xiaozhou village is an ecological tourism village inside a ten thousand acres orchard. It has the elements of developing low-carbon tourism products and faces severe tests.

### A. Natural and Cultural Tourism Resources

Tourist attractions are the primary conditions for the development and utilization of tourist spots. Low-carbon tourist attractions refer to those with low-carbon characteristics that can bring attraction to tourists and benefit the economy, environment and society of scenic spots. It can be various natural eco-low-carbon tourism products, such as national wetland park, national forest park, national natural reserve, etc. It can also be a man-made low-carbon tourism facility, such as a low-carbon hotel, a low-carbon restaurant, etc. It can also be a tourist attraction for the reconstruction and restoration of natural ecological landscape through low-carbon technology or carbon sink system.

With the title of the most beautiful village in Guangdong and the most beautiful rural tourism demonstration area in Guangdong, Xiaozhou village is located in the southeast of Guangzhou Zhuhai district, which is located in the subtropical

monsoon climate zone. The climate is pleasant and the ecological environment is beautiful. Yingzhou ecological park, the first green ecological park in Guangzhou, was built in the village. It has hundreds of species of natural organisms and is awarded as "Guangzhou ecological demonstration park" and "education base of Guangdong association of science and technology". In recent years, in combination with the construction of "happy Guangzhou and leisure Guangzhou", several convenient channels have been built in the scenic area of Xiaozhou village. Bike rental services and service Courier stations have been set up. It has attracted more tourists to transform the extensive driving tourism into the healthy low-carbon tourism with bicycle as the main mode of transportation, providing tourists with a low-carbon and leisure way of travelling.

Xiaozhou village is an ancient village with a history of more than 1000 years. In the 1990s, it was named as the village of protection of Guangdong historical and cultural city. It has a profound historical and cultural heritage. Through investigation and statistics, Xiaozhou village has 119 ancient relics such as ancestral temple, ancient bridge, alley street gate, ancient ferry dock, ancient well, ancient shop and ancient tree. There are 50 first-level protection values, accounting for 42%; 63 secondary levels, accounting for 53%; six of the three grades, accounting for 5%. For example, the oyster shell house that witnessed the changes of Lingnan water village in Xiaozhou village, the ancestral hall of Jian family which had the classical flavor of the Qing dynasty. These are the epitome of the historical changes of Xiaozhou in the past 100 years, the interpretation and demonstration of the image of Xiaozhou village as the ecological ancient village, and the indispensable part of the low-carbon tourism of Xiaozhou village.

### B. Low-carbon Tourism Facilities

Low-carbon tourism facilities are service facilities and infrastructure, equipment and other comprehensive materials created by low-carbon technology and carbon sink system to complete low-carbon tourism activities. These include low-carbon tourism catering facilities, low-carbon tourism accommodation facilities, low-carbon tourism visiting facilities, low-carbon tourism shopping facilities and low-carbon tourism entertainment facilities.

At present, the development of low-carbon tourism in Xiaozhou village is still at the primary stage, and there are the following major problems in the construction of low-carbon tourism facilities: First, a small number of homes have installed solar receivers on their roofs to make the most of clean, renewable energy. However, due to the large number of students who come for the art training every year and the consumption of the original residents of the community, the village as a whole is in a state of high energy consumption, high carbon emissions and high pollution. A small amount of solar energy will not solve the problem of energy consumption in Xiaozhou village today. Secondly, convenient road and bike rental Courier station have been built in the scenic area. Tourists have changed from driving themselves to using public buses to cycling as much as possible, so as to reduce air pollution to Xiaozhou. However, at present, there is no large car park in the scenic area where the bicycle can be

transformed from driving, which will bring inconvenience to the tourists. The third is the use of traditional building materials, pollution of the environment. The bricks used in the construction of Xiaozhou village are mainly red bricks. Red bricks are made by burning earth, which produces a lot of carbon and oxygen compounds that pollute the atmosphere. And red bricks are heavier than existing green bricks, so more energy is needed to transport them. Finally, human natural fertilizer has not been fully utilized, and water resources have not been fully utilized to realize multiple use of water resources.

### C. Low-carbon Tourism Services

Low-carbon tourism service refers to the service provided by tourism enterprises in the process of tourist tourism under the guidance of low-carbon concept, and non-material products provided to tourism enterprises by relevant government departments such as food, education, health and culture. This is a powerful support for tourism enterprises to provide services to tourists. At present, Yingzhou ecological park needs to buy tickets to enter. The park provides education of green agriculture technology, allowing tourists to participate in it and experience the changes brought by low-carbon technology to agriculture. At the same time, tourist guides will be set up to explain the service during tourists' sightseeing, so that tourists can clearly understand the low-carbon technology used in Yingzhou eco-park. However, one does not need to buy tickets in Xiaozhou village, so there is no low-carbon knowledge explanation service and low-carbon experience guidance in the scenic area, which is one of the areas that need to be improved in the future development of low-carbon tourism in Xiaozhou.

### D. Accessibility

Accessibility of tourism products refers to the degree of convenience, rapidity and accessibility of tourists moving back and forth between their residence and tourist destination and between multiple tourist destinations. The specific performance is the difficulty degree and the limitation standard of entering and leaving the tourist destination. This paper investigates Xiaozhou village from three aspects: First, the geographical environment of Xiaozhou village is remote and the travel time is long. But the traffic is convenient, and tourists can arrive directly by bus. Second, there is no need to worry about losing contact with the outside world. Thirdly, there is no threshold for tourists in Xiaozhou village. Tourists can go there at ease.

## III. TOURISM EXPERIENCE AND EXPECTATION ANALYSIS OF TOURISTS IN XIAOZHOU VILLAGE

Experience economy is the fourth stage of human economic life development after agricultural economy, industrial economy and service economy. As a kind of product that tourists consume, low-carbon tourism product is an important factor that determines its development and design. In the context of experience economy, with the maturity of economy and low-carbon tourism, the consumption of low-carbon tourism will develop from product and service consumption to experience consumption. Tourists will tend to

experience travel in depth rather than in the simple point-to-point links that exist today. Therefore, the study of tourist experience provides an important theoretical basis for the development and design of low-carbon tourism products in the future.

From January to June 2017, the research team studied the tourism experience of tourists in Xiaozhou village through online and offline channels. As a rural eco-tourism village, Xiaozhou village attracted a large number of tourists after it was exposed by mass media in 2006. The simple culture, folk customs and beautiful ecological and natural scenery make the number of tourists increase continuously after 5 years of development. However, in recent years, the number of tourists in Xiaozhou village has declined continuously, and the satisfaction of tourists has declined. The research group divides tourist tourism experience into three aspects: ecological experience, tourist sightseeing experience and self-realization experience in "Fig. 1". Interviews were conducted with tourists visiting Xiaozhou village. The results showed that the development of Xiaozhou village had the following development problems with the increase of time:

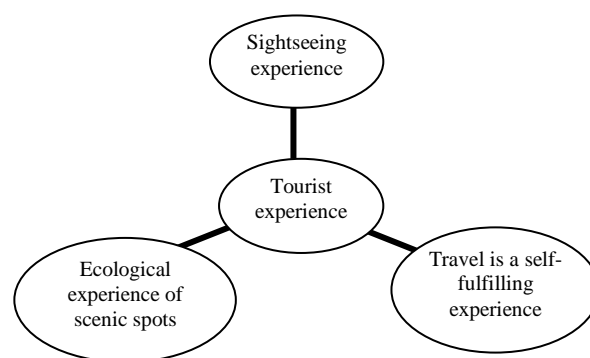


Fig. 1. Tourist experience composition.

### A. Ecological Experience of Scenic Spots

In the past, Xiaozhou village was an eco-tourism village surrounded by ten thousand acres of orchard. Its focus is to allow tourists to experience nature, absorb negative ions and keep away from urban pollution. However, with the development of land expropriation policy by the government and commercialization of scenic spots, a large amount of agricultural land has been converted into commercial land under the active role of community residents' supervisor, and the green area in the village has been continuously reduced. Secondly, a large number of tourists and art training students enter the scenic area, resulting in the number of tourists exceeding the reasonable capacity of the scenic area. In order to meet the living needs of art trainees, the villagers have built a lot of buildings, dismantled houses and rebuilt them.

Due to the lack of reasonable planning in the village, the extensive construction methods adopted by the community residents have resulted in serious solid pollution and air pollution. The ecological experience of tourists has been seriously affected, and they cannot experience the beautiful natural scenery and the fun of outdoor activities. Therefore,

tourists are eager to preserve and repair the local ecological environment and reduce environmental pollution, so as to get a higher level of ecological experience.

### B. Tourist and Sightseeing Experience

Xiaozhou village is a perfect combination of natural tourism and cultural tourism resources. It is the best choice for tourists to visit and experience the water culture of the south of the Five Ridges. The survey results show that tourists are less satisfied with the tourism experience of Xiaozhou village and believe that the ecological environment and cultural relics protection of the scenic area are insufficient. The current situation of the ecological environment is worrying, and it is difficult for them to experience the natural environment and cultural environment that has not been damaged. Some tourists say that scenic area stores are a very important part of the eco-tourism experience. At present, there are more and more art jewelry stores or coffee shops with artistic features in Xiaozhou village, which have attracted many tourists to make consumption. However, many products lack creativity, and the manufacturing materials are not environment-friendly materials, which are not in line with the concept of eco-tourism development. Therefore, in the future, tourists will pay attention to the innovation and protection of tourism resources in Xiaozhou village, hoping for a more perfect sightseeing experience.

### C. Learning and Value Realization Experience

Tourism can not only relieve life pressure and promote physical and mental health, but also understand local folk culture and increase knowledge. Xiaozhou is now completely free to enter, and there is no guide or eco-experience program. Village features such as oyster shell house, ancestral hall, etc. lack of detailed introduction. Under such a tourism mode, it is difficult for tourists to understand the local history and culture or learn about the application of ecological technology from eco-tourism, which is not conducive to tourists enjoying self-realization experience in the process of the tour. Therefore, tourists hope that in the context of the development of experiential tourism, scenic spots can provide tourists with more tour guides and ecological education experience services.

## IV. DEVELOPMENT AND DESIGN SUGGESTIONS OF LOW-CARBON TOURISM PRODUCTS IN XIAOZHOU VILLAGE

Ecotourism is an idea and a guiding thought, while low-carbon tourism is practical and concrete. Low-carbon tourism emphasizes the use of low-carbon technology and carbon sink system to develop tourism attractions, create low-carbon tourism experience, guide low-carbon tourism consumption and create low-carbon tourism civilization. It is a new way of tourism development under the concept of ecological tourism. The development of low-carbon tourism products in Xiaozhou village is not only conducive to the restoration of ecological environment and the re-development of tourism industry in Xiaozhou village, but also can increase the income of residents and investment in the development of tourism community, so as to improve the attachment and cohesion of community residents.

### A. Development of Low-carbon Tourism Products

In the past, the development mode of tourism products was mainly divided into tourism products, investment subjects, regions and comprehensive conditions. This paper will break through the traditional development model in the past, combine the specific situation of Xiaozhou village, and creatively apply the model combining community participation and theme experience. Under the mutual restriction and influence of four stakeholders in the tourism industry -- tourists, community residents, governments and low-carbon tourism enterprises, we will jointly contribute to the development of low-carbon tourism products in Xiaozhou village in "Fig. 2" Under this development mode, low-carbon will become one of the themes of tourists' sightseeing in Xiaozhou village. Xiaozhou village will not only be a demonstration base for eco-tourism development, but also an experimental base for low-carbon themed tourism in Guangzhou. The development of low-carbon tourism products in Xiaozhou village is based on the ecological tourism resources, which is formed and provided to tourists through the concept of low-carbon technology and carbon sink system. Therefore, the development and design of low-carbon tourism products in Xiaozhou village are closely related to ecological tourism resources. Tourists will enjoy low-carbon dining mode, low-carbon accommodation service, low-carbon transportation tools, low-carbon sightseeing tour, low-carbon consumption and shopping, personal low-carbon entertainment education experience and other experiences while enjoying eco-tourism in Xiaozhou village. The environmental awareness of tourists in Xiaozhou village will be improved by the low-carbon tourism atmosphere of Xiaozhou. Meanwhile, the ecological environment and cultural environment of Xiaozhou village will be gradually restored by the development of low-carbon tourism products.

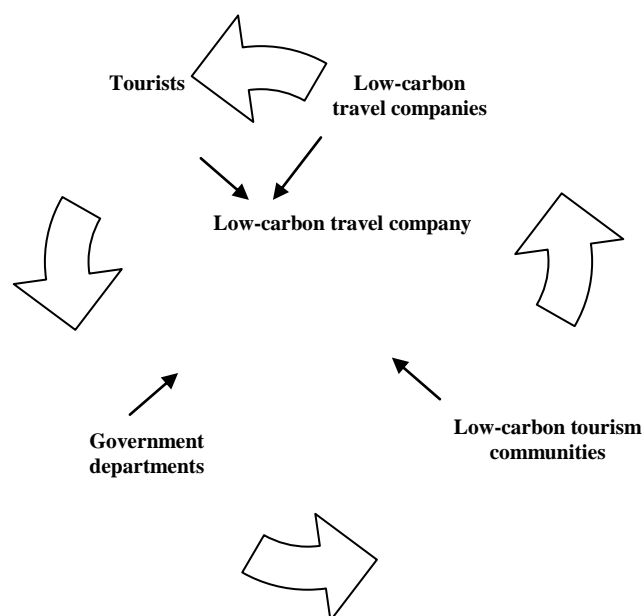


Fig. 2. Low-carbon tourism stakeholders.



## B. Design of Low-carbon Tourism Products

The low-carbon tourism products of Xiaozhou village will change the past model of large-scale scenic spot construction led by the government or investors. The sustainable development of low-carbon tourism in Xiaozhou village can be realized by making a large use of existing eco-tourism resources and involving residents, tourism enterprises, government departments and tourists in the construction and transformation of low-carbon tourism facilities.

1) *Tourists*: Tourism products are market-oriented products. The experience and consumption trend of tourists play a vital role in the development of tourism products. Tourists should set up the concept of low-carbon tourism consumption and the concept of low-carbon tourism entertainment and change the past high-demand tourism mode. Try to use bicycles or walk into Xiaozhou village to reduce the pollution caused by transportation and increase the participation of low-carbon experience.

2) *Government departments*: The development and design of tourism products need to give full play to the leading role of the government and realize the sustainable development of scenic spots with the support of the government. In view of the current experience of tourists in Xiaozhou village, the government should introduce relevant environmental improvement policies to slow down the decline of tourism industry in Xiaozhou village. First, the government can build a medium-sized car park and set up a bicycle rental Courier station outside Xiaozhou village. At the same time, the number of green roads around Xiaozhou village will be increased to reduce the number of self-drive vehicles entering Xiaozhou village, so as to reduce air pollution and improve tourism experience. Second, the government should formulate relevant policies to stop the non-environmental behavior of community residents in the demolition of old houses. A team of experts will be set up to repair and maintain the historical sites of Xiaozhou village, and tourist guides or navigation machines will be hired to convey the development of Xiaozhou village to tourists. Tourists will only have to pay for the tour guide service, so as to promote the "low-carbon culture" to tourists. Third, it has banned tourism companies and residents from directly pouring sewage into rivers, requiring them to be filtered to ensure they meet environmental standards before entering the river. Meanwhile, it is forbidden to pile up solid waste at will, especially construction waste. Waste must be sorted and placed at a fixed location, converted to useful materials or degraded by low-carbon technology.

3) *Low-carbon tourism community*: With the help of the government, residents in the community have made the following transformations and by designing low-carbon posters, tourists can learn more about the low-carbon measures of Xiaozhou village, which will spread the low-carbon culture of Xiaozhou village to more tourists: First of all, community residents and tourists work together to increase the green vegetation in Xiaozhou village. At the

same time, we will protect the existing agricultural planting areas, use natural chemical-free fertilizers to raise poultry, grow natural organic vegetables and sell them to tourists and let them experience the organic cultivation process. Second, solar chips are installed on the top floor of the building. Xiaozhou village is close to the Tropic of Cancer. During the non-rainy season, there is abundant sunlight. The use of solar energy will reduce the use of traditional non-renewable resources and the carbon pollution caused by the burning of polluting energy. Third, under the reasonable planning of the government, the demolition and construction of houses abandoned the past high pollution, non-environmental protection of red bricks but use green bricks as raw materials for new buildings. Red bricks are made from earth fired from coal, which produces a lot of carbon monoxide and affects the structure of the atmosphere. The raw material of environmental protection brick is cinder and there is less pollution in the production process. It is lighter than the traditional red brick, which can reduce the air pollution in the transportation process. The other is the rainwater harvesting. Rainwater is one of the important sources of water resources. With the support of the government, the community can set up a simple rainwater collection system on the top floor of the building, and the collected rainwater can be used for toilet flushing, so as to reduce the waste of water resources. Finally, the renovation of the indoor pattern of new community dwellings should reduce the area of closed space and increase the area of relatively open space. The indoor space that needs illumination such as the sitting room moves to daylighting good position, and the indoor space that does not pursue daylighting too much such as bedroom, toilet does the opposite processing.

4) *low-carbon tourism enterprises*: Low-carbon accommodation: the rural inns, family hotels and other accommodation in Xiaozhou village should not offer the one-off goods for free. Tourists are encouraged to bring their own toiletries to save water and electricity.

Low-carbon catering: Food and beverage enterprises should choose organic vegetables grown by community residents and poultry raised with natural feed as food and beverage materials to avoid pollution to rivers caused by fertilizers, pesticides and other additives. Choose local food materials to avoid energy consumption and carbon emission caused by foreign food transportation, packaging, storage, etc. Do not use disposable plastic or wood cutlery to reduce the amount of tree cutting.

Low carbon shopping: Encourage tourists to buy local products and souvenirs of Xiaozhou village. For example, Xiaozhou village has a tradition of planting poplars. Therefore, tourists are encouraged to buy poplars and processed products of poplars. So as to reduce the actions taken by community residents in order to make a living and avoid large areas of demolition houses for rent and other activities that are damaging the ecological environment. Stores should also reduce the packaging of products or use low-carbon recycled materials for packaging, and do not actively provide packaging

plastic bags to improve tourists' low-carbon travel experience. Low-carbon tourism is in line with the trend of today's low-carbon economy. Its concept of energy conservation, emission reduction and environmental protection is in line with the needs of China's economic development at present. Undoubtedly, it will be the trend and a trend of China's tourism development in the future. Xiaozhou village will be a pioneer place for the development of low-carbon tourism in Guangzhou. The design of low-carbon products in Xiaozhou village will be spread to all sectors of China's economy and promote the sustainable development of China's economy.

## V. CONCLUSION

In the context of the sustained development of China's and even the world's tourism industry, the overall number of tourists has increased year by year, which has put forward more and higher requirements for low-carbon tourism and environmental protection. The development of low-carbon tourism in Xiaozhou village combined with the experience of tourists is the only way for the sustainable development of tourism. Low-carbon tourism is an important part of low-carbon civilization. It has set up a mechanism that is restricting, influencing and promoting each other among tourists, community residents, governments and tourism enterprises related to the interests of low-carbon tourism. We should change the traditional idea of separating from each other, cooperate in the construction of low-carbon tourism facilities, and jointly develop low-carbon tourism products. We should gradually build Xiaozhou village into a low-carbon tourism community and lead low-carbon tourism fashion. This model can also provide references for other regions to develop low-carbon tourism or low-carbon tourism enterprises to conduct business

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