Study on Ecological Resources and Tourism Sustainable Development of Xixi Wetland

HU Die†

†Tourism and Culinary School, Zhejiang Business College, Hangzhou, Zhejiang Province, 310053, China
*Corresponding author’s e-mail: joyce-hu123@163.com

Abstract. With the rapid development of the urbanization in China, the wetland ecotourism has become a popular form of travelling for the most of consumers in recent years. The development of the wetland ecotourism not only can enrich the ways of tourism and promote the economic development of the wetland areas, but also can establish a foundation for the comprehensive development of tourism industry. However, as the development of tourism industry in China is not long enough, at present, the wetland ecotourism is still making process. Besides that, due to the lack of scientific understanding, people often ignore the influence and destruction of the tourism ecological resources caused by travelling. And people also ignore the psychological capacity and economic demand of the residents who live in the wetland. This paper intends to carry out a field study on Xixi Wetland to explore the existing problems of the ecotourism on it. And then, according to the result of this research, the corresponding countermeasures of ecotourism are provided based on the analysis of the sustainable development of ecotourism of Xixi Wetland.

1. Ecological tourism

Ecological tourism (Ecotourism) is a new form of tourism proposed by the International Union for Conservation of Nature (IUCN) in 1983. [1] Ecotourism is guided by the ecological principles. It aims to protect the natural and cultural tourism environment. The main goals are enhancing people's awareness of ecological protection and promoting the harmony between human and nature. Ecotourism emphasizes on the coexistence between the subject and the object of tourism. It is a kind of tourism modes that combines the natural ecological environment with the symbiotic cultural landscape to carry out ecological experience, ecological cognition and ecological education. Then, the physical and mental pleasure are obtained from all of these. In 1993, the International Ecotourism Association defined ecotourism as 'the tourism activities with the dual responsibility of protecting the natural environment and maintaining the lives of locals'.[2] Many countries promote ecotourism activities to effectively meet the internal demand of the public for new tourism consumption and facilitate the positive sustainable development of tourism industry. Under this premise, various forms of ecotourism projects are developed prosperously and flourishingly. China's ecotourism has emerged in this context, which makes an important role for ecotourism in ensuring the sustainable development of tourism industry.

2. General Situation of Xixi Wetland

Xixi Wetland is mainly known as a wetland park, which is located in the west of Hangzhou. Its east is the west side of Zijingang Road, its west is to the east side of the Ring Road, the south is along the
Westlake, and the north extends to the Wener Road. The average length from east to west is about 4.6 km, and from north to south is about 3.7 km. The total area is 11.5 km². Xixi Wetland has four distinctive seasons and a mild climate. The average temperature is 16.2 °C. The annual average humidity is 78%, and the annual average rainfall is about 1,400 mm. The rate of water surface of Xixi Wetland is more than 50%. It is the first national wetland park that integrates urban wetland, agricultural wetland and cultural wetland into a whole. What’s more, it is also a kind of wetland scenic areas with the educational functions of both ecotourism and ecological environment, as well as the functions of species and habitat protection. Xixi Wetland Park was basically built up in October 2008 and opened in May 2009. At present, there are 15 scenic spots having been developed and opened, including Fishing village in Misty Rain, Plum and Bamboo Village, Hezhu Street, Qiuxue temple and Gao Zhuang, etc.

There are three ecological restoration areas and ecological protection areas are set up in order to strengthen the ecological protection. Moreover, there are 3 bioremediation pools and 1 wetland ecological ornamental area in this wetland park. It can be divided into two categories: natural wetland and constructed wetland. The natural wetland is divided into river wetland, lake wetland and swamp wetland. The constructed wetland is divided into canal and pond. The unique geographical location and the natural conditions create the diversity of animal species and the abundant of plant types in Xixi Wetland. According to the interview of the staff in Xixi Wetland, there are 264 species of vertebrates and 183 species of invertebrates in wetland park. Through the biodiversity monitoring result by Xixi National Wetland Park in 2018, Xixi wetland park is also rich in natural plant types, which can be divided into 6 plant types, 20 formation groups and 20 formation. [3] From the result of field survey, there are 85 plant communities, 69 types of natural plains, 57 artificial and semi-artificial plain types, as well as 696 species of vascular plants in Xixi Wetland Park. What’s more, The National second-class protected vascular plants are 4.

Xixi Wetland is also very suitable for the development of tourism industry. There are a variety of different tourism resources. All of these tourism resources are divided into 8 main categories, 20 basic types and 127 representative resources and attractions.[4] Among that, Xixi Wetland is rich in building and facility resources. And its natural resources and cultural resources bring out the best in each other. The data is revealed in figure 1. The proportion of buildings and facilities is as high as 34.64%, followed by the proportion of cultural activities, which is 25.97%. Aquatorium landscape and tourism commodity account for 10.24%. Biological landscape and ancient site are 7.1%. Geographical resources are as the same as the sky phenomena and climate, which are 2.4%. Therefore, Hangzhou Xixi Wetland tourism zone was awarded the title of ‘National AAAAAA Level Tourist Attraction’ in 2012.

![Figure 1. The Proportion of Tourism Resources in Xixi Wetland](image)

3. The limiting factors of the ecotourism sustainable development in Xixi Wetland

In order to more clearly understand the limiting factors that impact the sustainable development of ecotourism of Xixi Wetland, the relevant research has been organized. The main object of this survey
is visitors who visited Xixi Wetland park. There are 500 valid questionnaires were collected. In addition, more than 200 residents were interviewed. The content of this survey is relatively comprehensive and the proportion of the sample is more balanced. The ratio for male is 47% and for female is 53%. The main age group, who visited Xixi Wetland park, are people aged 18-30 and 51-60, that accounts for 34% and 32% respectively. Among the respondents, 22% are graduated from junior high school or below, 24% are graduated from senior high school, 43% had a college or bachelor degree and 11% had a master degree or above. In terms of monthly income, 23% of respondents have a monthly income below 3000 yuan, 36% has a monthly income between 3001 and 5000 yuan, 5001-7000 yuan accounts for 16%. Those above 7000 yuan accounts for 13%. Moreover, there is a 12% of respondents have no any income, because they are still students.

The result of this survey indicated that although Xixi wetland park is rich in ecological resources and has an excellent ecological environment, there are still some problems influence the sustainable development of ecotourism of Xixi Wetland, such as tourist overload, water environment pollution, and man-made waste pollution, etc.

3.1 Overload of tourists in scenic spots
Although there are numerous scenic spots in Xixi Wetland park, tourists are usually like to gather to visit the same scenic spots that lead to serious overload of local space. Different from group tourists, individual tourists will only choose some well-known scenic spots according to the route map. The survey result of ‘Visitors Must Go Sites’ on figure 2 shows that there are 97% visitors must go to Hezhu Street, 89% travelers would like to go to Deep Pool Mouth, 87% people love to see Yanshui Fishing Ground, 73% tourists are keen on Autumn Snowing Hut, and 66% guests choose to visit Plum and Bamboo Mountain Village. However, because of the season period, the attractions such as Green Dike, Mr. Gao’s House, and Qushui Nunnery just have few tourists during the off-season. For example, the tourists will only visit the Green Dike during the flowering period. This spatial distribution of tourists in the whole park is extremely unbalanced which leads to serious local space overload. This kind of overloading not only has a great impact on the ecological tourism capacity of the scenic spots, but also the quality of tourists' traveling experience. The research shows 47% of tourists have already perceived a high degree of crowding in some famous scenic spots.

Figure 2. The list of tourists’ favorite attractions

3.2 The serious pollution of water environment
Under the background of rapid development of wetland tourism, China has gradually strengthened the exploitation and utilization of Xixi wetland tourism resources. The domestic water consumption of local residents in Xixi Wetland increased significantly. However, due to the lack of perfection of the sewage treatment system, it is difficult to dispose the large amount of domestic sewage timely. Thus the remaining wastes have to flows into the natural rivers of Xixi Wetland and causes a great damage and pollution to the water environment such as rivers and lakes. In addition, driven by economic interests, the number of tourists privately received by residents is increasing, the sewage discharge is
also gradually rising. What’s more, as a result of the constant feeding into the fish ponds and the extremely low frequency of the annual water change, eutrophication pollution of fish ponds is increasingly serious. [5] The research data on figure 3 disclosed that fish (93%) are the most severely destroyed creatures in ecotourism resources on account of the pollution of the water environment. The next are plants (84%), birds (51%), wildlife (47%) and soil (38%) respectively.

Besides that, the residents and tourists are almost traveling by motor boats since the inland transportation is not developed well. However, most of the motor boats are powered by diesel oil which results in water oil and other pollutants exceeding the standard. All these phenomena not only affect the experience of tourists in the process of traveling, but also threaten the sustainable development of the ecotourism environment of Xixi Wetland.

3.3 The increasing of man-made waste pollution
The man-made waste is divided into household waste and tourists waste. Because the government advocates the policy of protecting the original appearance of Xixi Wetland, the infrastructure construction of Xixi Wetland is relatively backward. The limited waste treatment system unable to timely centralized dispose all the garbage. As a result, it causes great pollution to the ecological environment of Xixi Wetland, brings bad traveling experience to the tourists and more security risks to the residents. What’s more, under the rapid development of wetland tourism, the pollutants in various activities generated by tourists are gradually increased. Figure 4 indicated that there are 29% of visitors seeing 3 or 4 different kinds of trash during their visiting. And 47% of them saw 5 or 6 kinds of rubbish. Even 16% of tourists point that they catch insight of 7 or more litter in Xixi Wetland park. Generally speaking, tourists often have bad tourism behavior. They throw out various garbage in both scenic areas and the rivers. This is also one of the reasons caused the ecological pollution. All of these man-made wastes put great pressure on the waste disposal system of Xixi Wetland. And it is easy to bring different levels of issues on garbage pollution, which could highly affect the tourists’ moods and threaten the health of the residents.
4. The suggestions on sustainable development of ecotourism in Xixi Wetland

4.1 Effectively control visitor capacity
Tourists’ perception on some wetland scenic spots is not high enough which results in the phenomenon of large crowds gathering in other scenic spots. Through the theme construction and theme marketing of scenic spots, the tourist capacity of each scenic spot can be effectively dispersed. Firstly, wetland theme activities should be added in the scenic spots with low perception. For example, in non-flowering period of Green Dike, a variety of exhibitions and science activities could be held. Other attractions can be arranged as the display area for natural wetland ecosystems and wetland plants with the theme of wetland botanical garden and underwater corridor. It can also distribute some birding sites in these low sensitive spots. Secondly, for those areas with geographically desolate and that are often not visited by tourists, they should be developed into the viewing places or outdoor science centers which equipped with characteristic wetland landscape and wetland ecosystem. Thus, the scale of space is expanded to achieve the expansion of space capacity. As well as the tourists are attracted that generating those overloaded attractions are dispersed. Finally, Xixi Wetland should also strengthen its website, brochures and promotional activities to increase visitors' understanding of wetland knowledge, wetland products and its spatial distribution of Xixi Wetland park. So as to balance the geographical distribution of tourists in the park.

4.2 Strengthen the construction of waste disposal system
There is an important topic in environmental protection of ecotourism of Xixi Wetland, that is how to solve the problem of domestic pollution. It is necessary to take effective measures to improve the waste disposal capacity, so that the protection of the ecotourism environment of Xixi Wetland can be fully implemented. Firstly, the construction of sewage treatment system should be strengthened actively. A more economical and efficient sewage treatment system is designed on the basic of the geological and topographic conditions of Xixi Wetland. The emphasis is placed on the domestic sewage treatment system. In this way, the sewage can be discharged efficiently, and it can be prevented from being discharged into rivers and lakes. So as to effectively reduce the water pollution and protect the ecotourism environment of Xixi Wetland as well. Secondly, the construction of waste disposal system should be reinforced drastically. A sufficient number of trash cans should be arranged around the key points of the tour route to avoid the garbage problem by the tourists. It is convenient to systematize and centralize managing all the garbage. Thus, the efficiency of waste treatment can be enhanced effectively. Simultaneously, it is necessary to establish a transfer station for the non-corrosive garbage and the garbage compost in Xixi Wetland. This station can recycle the recyclable garbage and reduce the waste. Therefore, the waste disposal capacity of Xixi Wetland is improved. And the ecotourism environmental protection of Xixi Wetland can be successfully achieved.

4.3 Improving public awareness on eco-environment protection
Xixi wetland should pay more attention on environmental protection. On one hand, they should use a variety of promotion approaches to guide the visitors to responsibly carry on ecotourism. And some relevant incentive measures can be adopted to let the visitors look into Xixi and at the same time, also pay attention to the importance of environmental protection. On the other hand, they should intensify the production of signs inside scenic areas. Always reminding the tourists do not throw the garbage and telling them the location of the trash cans in each scenic spot. Beyond that, the eco-environment protection cannot be completed without the support and cooperation of the masses. The government should strengthen the publicity and popularization of eco-environmental protection. What's more, they also should positively guide the publics to participate in the eco-environmental protection by the medias such as Microblog and WeChat. Consequently, the public can fully realize the essential significance of ecotourism environmental protection and be actively engaged.
5. Conclusion
The superiority of the ecological resources determines that the development potential of tourism industry in Xixi Wetland is observably immense. With the continuous improvement of people's material and cultural living standards, the quality and aesthetic taste of tourists have been correspondingly risen to a higher level. In accordance with the concept of sustainable development, both the economic development and environmental protection of Xixi wetland can be promoted and improved by protecting the existing ecological resources, balancing the ecological resources and tourism environment, scientifically planning and rationally developing the Wetland, as well as exploring ecotourism in an eco-friendly way.

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