The Present Situation and Development Research of Recreation Ecology

Quan ZHOU[1*], Guoqin HUANG[1], Qiguo ZHAO[2]

1. Research Center on Ecological Sciences, Jiangxi Agricultural University, Nanchang 330045, China; 2. Nanjing Institute of Chinese Academy of Sciences Soil, Nanjing 210008, China

Abstract With the continuous development of society, the problem of the tourism also appears more outstanding. The article analyzed the relationship between ecotourism and recreation ecology on the basis of the understanding and researching, and put recreation ecology forward a deeper level of request. How to develop the tourism, including ecotourism, is the problem to be solved. Five research methods about recreation ecology were introduced, namely the field survey method, the positioning method, the ecological simulation method, the modern information technology method and the tourism evaluation and planning method, from the point of view of research methods to elaborate the present situation of recreation ecology at home and abroad. The relationship of recreation ecology and landscape ecology, landscape architecture, biological statistics and the potential were discussed at the end of the article.

Key words Recreation ecology, Ecotourism, Research methods, Landscape ecology, Landscape architecture, Biological statistics

1 Introduction

Nowadays, with the development of human civilization and life level, tourism has become an essential part of people's daily life, which brings about more and more ecological questions. In order to solve these problems, it is not enough to depend on ecology or tourism ecology, for they are too general. However, the tourism ecology can make up such disadvantage to certain degree, because it makes specific researches and explorations towards tourism activity from the point of view of ecology.

Though tourism activities develop fast in various forms, people know little about tourism itself, which results in lots of obstruction in the actual application of recreation ecology. Besides, since the year of ecotourism in 1999, the booming ecotourism has posed more serious challenges towards tourism ecology and has resulted in many arguments.

1.1 Ecotourism As a kind of travelling activity, ecotourism has its own connotation, besides of general travelling activity. People have different understandings of ecotourism. Claude Moulin proposed ecotourism for the first time and stressed the protection of travelling resources and involvement of local citizens. Lascurain defined tourism as transition from traditional general tourism towards natural scenery. Lu Yunting[1] defined ecotourism from the point of influence of tourism towards environment, *i. e.* based on ecology, ecotourism can bring in social benefits and promote the protection of ecological environment. In 1993, international ecological travelling committee gave a definition of ecotourism as the travelling activity which can link the protection of natural environment with the local people's life. The economic and social significance of tourism is considered in the reflection of ecology. Liu Jiaming[2] thought that ecotourism should be a particular natural sightseeing form based on natural scenery and local custom. According to the degree of getting close to nature, the nature is divided into three levels, being close to nature, returning back to nature and uniting with nature. Besides, Mao Zhenbing *et al.* concluded four kinds of relevant arguments and thought that ecotourism must stress its educational function to wake up people's awareness of nature and environment protection, and to recognize the prerequisite of ecotourism. Generally speaking, there are too many limitations. It is necessary to focus on its particular characteristics, combining nature with humanity and stressing economy and education. Only when there is a balance between tourists and the ecological traveling destination can ecotourism exist and develop.

1.2 Recreation ecology Recreation ecology belongs to applied ecology, a branch of ecology. It comes into being when people begin to think about the development of tourism in the angle of ecology after they have to deal with various ecological problems. Recreation ecology has its own study theory, study object, and study method. What it has to solve is the development of ecological civilization. Its responsibility is to rethink, recover, prevent and improve the current pollution. Liu Hongyan[4] thought that what recreation ecology has to study should be the evaluation of natural scenery, analysis of ecological achievement and management of natural scenery based on ecological theory. Wu Bihu[5] used to say that the study of recreation ecology included three aspects, influence of travelers and tourism management on ecological system, influence of environment on tourism, and applied study on ecotourism. Na Shouhai[6] thought that recreation tourism is the science to study the relationships among tourism, nature, and social culture. The study purpose is to guarantee the sustainable develop-

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* Corresponding author. E-mail: zhouquanyilang@163.com

ment of tourism and to solve the contradiction between tourism development and environment. Therefore, the fundamental problem of recreation tourism is environment. Certain status of nature has come into being. The key to solve the contradiction is how to adjust to nature. The study of ecological environment should be the key of ecotourism study, such as environmental bearing capacity, etc.

1.3 Relationship between ecotourism and recreation ecology

As shown in the above analysis, ecotourism is closely related to recreation ecology. There are many similarities and differences. Thus, it is inevitable to mix both in the studies. Zhang Jia'en mentioned in the recreation ecology that the concept of recreation ecology comes from ecology. The booming recreation tourism promotes the development of ecotourism, because the development of ecotourism is based on the theory and technological method of ecotourism. In terms of subject system, ecotourism is only one part of recreation ecology.

The relation between ecotourism and recreational ecology should be discussed based on the relevant backgrounds. Recreational ecology studies tourism in terms of ecology when people aware the ecological problems from tourism, while ecotourism comes into being when people try to find better living environment based on the fast social development. Recreational ecology is related to ecotourism. Firstly, ecotourism is an essential part of recreational ecology. Secondly, ecotourism provides theoretical basis for the development of ecotourism. Thirdly, both follow the principle of sustainable development and the benign circulation of ecological environment. Fourthly, ecotourism differs from ecological environment. The former focuses on human activity, while the latter cares about the environment itself.

In conclusion, the study object of recreational ecology is various traveling forms, including ecotourism. What recreational ecology studies is the ecological problem in various travelling places or travelling activities. Ecotourism can be considered as an expression of high level of recreation ecology. Meanwhile, as a subject with universal application value, ecotourism should have its significance in various ecological situations. The wider connotation of ecotourism should be the ecological construction of various travelling spots or travelling activities. The actual connotation of ecological garden is the ecologicalization of gardens. The ecotourism itself has high demands towards original objective condition of nature, while few places in the world can meet such demands, which is bad for the popularization of ecotourism. The urge of human being might cause another massive large scale development and exploration, which would in return lead to unfavorable ecological problems.

2 The current study of recreation ecology based on five kinds of study methods

In 1928, the study on the influence of rosewood national forest park in California by American Meinecke[8] was the earliest one, about the origin of ecotourism. In 1987, *Wildland Recreation: Ecology and Management* by Hammitt, and the *Recreation Ecology: the Ecological Impact of Outdoor Recreation and Ecotourism* by Liddle were considered as the sign of a new subject. From now on, recreation ecotourism has developed from theoretical subject to methods. In China, recreation ecotourism started from the early 1980s. The publication of Recreation Ecology by Yanfu in 2004 and Zhang Jia'en in 2005 motivated the rapid development of recreation ecology in China. The paper discussed the studies of recreation ecology in China and abroad in terms of study methods.

The current study method includes two kinds, namely tourism and ecology. In Recreation Ecology, Zhang Jia'en summarized the study method of ecotourism into six kinds, namely field investigation and data collection, location measurement and original experiment method, ecological method, 3S technological method, ecological model and simulation, and comprehensive evaluation method[7]. Besides, Jin Xiulong and Lu Lin studied the origin, occurrence and development of recreation tourism and concluded four study methods, that is, field study method, spatial analysis method, ecological environment evaluation method, and ecological security method[9]. Based on above analysis, four major study methods were concluded in this paper, including field investigation method, location study method, ecological simulation method, modern information technological method, and tourism evaluation and planning method.

2.1 Field investigation method Field investigation is usually applied in many subjects, so is in ecology. The field investigation and questionnaires are the first step of every study, which provide necessary background and analysis data for further study. The study of tourism ecology is indispensable to the collection of background data and research of fundamental environment. Tang Shanmao[10] looked into the recreation ecology in Lijiang and proposed suggestions to ease the local conflicts. Xiang Yanping analyzed the competition between recreation ecology in Zhang Jiajie and Tian Menshan national forest park. Liu Qiaoling[12] studied the influence of tourism on the local scenery, such as soil, water, vegetation and local land use.

2.2 Location study method Ecological simulation method is to simulate the influence of artificial management on the tourism by artificial management, such as disturbance theory, ecological environment bearing theory, *etc*. Cole and Bayfield designed the influence of the trample on different vegetations. Through the observation and record of trample amount, they concluded that different vegetations were damaged to different degrees to the same trample amount, and the same plants in different paths suffered different degrees of influence[15]. Cole and Monz conducted field experiment in the high mountains in Rocky Mountains so as to simulate the spatial influence mode in the camp field.

2.3 Ecological simulation method The ecological simulation method refers to the simulation of tourism manually, which is based on tolerance theory, disturbance theory, interaction among animals, and ecological environment bearing theory, etc. Cole and bayfield[15-16] designed a program to simulate the influence of

travelling route on different plants.

2.4 Modern information technology method The rapid development of information and technology promoted the study of ecology, especially the application of 3S technology. The data collected through GPS and RS was processed in the GIS software platform. In response to the characteristics and their relevance to ecotourism and "3S" technology, Hou Xiaoli *et al.*[17] made full use of "3S" technology to solve the non-sustainable development in ecotourism and realize the comprehensive coordination of economy, ecology, resource and the wellbeing of people. Dong Wei *et al.* analyzed the application of remote sensing-geological information system technology in certain scenic spot in Hubei Province. Zheng Xiaoxin[19] *et al.* first studied the evaluation of travelling suitability, including company name, location, town, latitude and longitude, company level, company type and company storage. Based on the definition of relevant indicators, Map Basic was applied for the calculation in the Visual Basic software platform.

2.5 Tourism evaluation and planning method The study object of recreation ecology is scenic spot. The evaluation and planning of scenic spot will directly influence its ecological value. The evaluation of scenic spot includes feasibility analysis, suitability analysis and various evaluation analyses during the process. Wang Baoli[20] *et al.* considered Xi'an City as the experimental study object and calculated the travelling ecological footprint in Xi'an in 2004. Study proved that the footprint of the recreation ecology in Xi'an in 2004 was 0.1194 hm^2 and the ecological bearing capacity per capita was 0.0198 hm^2, which reflected that the tourism in Xi'an City was in unsustainable development state. Effective measures should be applied to ensure the sustainable development of tourism. Li Rui *et al.*[21] measured the environment content in West River National Wetland Park from five aspects, recreation ecology content, spatial content, facility content, management content and psychological content. Results suggested the West River National Wetland Park can bear 4 145 to 6 450 people per day, which has actual significance towards the plan and management of Wetland Park. In fact, various study methods of recreation ecology are not isolated. Each study method is related and many study methods are usually applied at the same time in one program so as to obtain objective study result.

3 Development of study in future

Though the study on the recreation ecology develops fast in China, there are many disadvantages. For example, there are few studies on the ecological simulation. There should be a full round knowledge of the development of recreation ecology. The future of recreation ecology is discussed to enlighten the study of the subject.

3.1 Recreation ecology and landscape ecology Landscape ecology attracted many scholars in resources, environmental and ecological fields in the late 1980s. Varies theories in the landscape ecology were applied in the study of recreation ecology, ecological spatial theory, scenery change model, optimal ecological land combination, sightseeing and culture, ecological system analysis and GIS application, etc.[22]. Yu Botao[23] made relevant explanations on the bearing capacity of forest environment. Therefore, the development of landscape ecology would promote the development of recreation ecology.

3.2 Recreation ecology and landscape gardening In March 8, 2011, Academic Degrees Committee of State Council and Education Department promulgated Scholarship and Personnel Training Subject (2011)[24]. The first subject increased from 89 to 110. Ecology was separated from biology and became the first subject. This can be considered as coincidence and the necessity of social development. During the development of tourism, the ecological construction of landscape architecture is booming. Landscape in China has its own tradition. The theory of ecological construction completed the shortages in scenic spot construction, which laid a solid step for the sustainable development of ecology.

3.3 Recreation ecology and biological statistics With the rapid social development, the focus and attention of many subjects have varied incessantly. Software such as SPSS is widely applied in ecology. However, ecology is the subject to study the relation between biology and environment. There are many influences between various factors. Some statistics can't fully reflect the significance of problem. Therefore, it is necessary to introduce a specific statistics analysis method, namely biological statistics. The current popular CANOCO software is mostly applied in the relation between groups and environmental factors. Zhen Jingang[25] studied the relation between vegetation in Helan Mountain and its relation with environmental factors. Hao Zhanqin *et al.* studied the distribution of plants and relation with environment. The biological statistics is conductive to the development of recreation ecology.

4 Conclusions

Recreation ecology is a comprehensive subject and there are many obscure contents. During the analysis of ecotourism and recreation ecology, the innovative point is to focus on basic study method and to classify the current studies on recreation ecology. Because of unsound study theory and method, it is necessary to associate recreation ecology with other subject. There are still many aspects to be discussed in future, scenic spot planning theory, ecological management theory, development of ecotourism, influences of ecotourism on local society, life cycle of scenic spot and application of recreation ecotourism theory.

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