

A Review on the Adaptability of Tourism and Social-Ecosystem

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Abstract

With the development of tourism, tourist activities all the time impact tourist areas of economic, cultural, social and ecological environment, inappropriate tourism development mode or management strategy can cause resources exhausted or even degradation in the tourist destination, and complex human society in the process of maintaining stability of the system played a key role. Adaptability is an important part of social-ecosystem research, so it is of great value to study the adaptability of tourism destination social-ecological system in tourism development. Based on the analysis of the theory of social-ecological system and its adaptability, this paper summarizes the research status of the social-ecosystem in the tourism area under the disturbance of tourism. Through literature analysis and induction, from “adapting to the object”, “adapting to the subject” and “adapting to the type and method” three viewpoint outlined the adaptability research direction and its practice, and points out the research focus and developing direction of the future tourism destination social-ecosystem adaptability on across-scales, different subject, system factors and city aspects.

Keywords

Social-Ecological System, Adaptability, Tourism Destination, Tourism Subject

1. Introduction

As the subject of tourism, human beings are the actors and recipients in the development of tourism and one of the main elements in the ecological system of tourism destinations. Human society and natural ecology are interdependent and exist as a whole. The intervention of human activities plays an important

role in the change of ecological environment. This emphasis on the human-place relationship refers to the dynamic coupling relationship between human activities and ecological environment in the region, namely, the social-ecological system theory. It originated from the study of the human-place relationship in the academic field, and emphasized the integration of the research orientation in the academic fields such as ecology, anthropology and geography, especially the mutual influence and effect of human activities and ecological environment in the region [1]. The main factors of social-ecological system's stability is derived from the external disturbance and dysfunctional of human-place relations caused by disturbances, and the adaptability of the system to external interference is a key attribute to describe the state of the system [2].

In recent years, the research on adaptability increased year by year, mainly in the natural and human factors influence on ecological environment, such as the research on the influence of ecological environment impacted on climate and city pollution under the background of global environmental change, especially the research on the influence of the natural ecological environment. However, there are relatively few studies on the impact of social ecological environment, especially the social-ecological system subject in dealing with the system ability to adapt and adjust to change, and the coordination between the subject. With the development of tourism, the problems of the relationship between human-place, such as the planning of tourism destinations, the entry of tourists and the participation of residents, have become increasingly prominent. Tourism is as a disturbance factor, while promoting the economic development of tourism destinations, also has a certain impact on the ecological system, including natural ecology and social ecology. Some scholars have been concerned about the existence of related problems. For the first time, Petrosillo I. *et al.* (2006) explored the relationship between "visitor pressure" and "ecosystem quality" in the "social-ecosystem based on tourism activities" [3]. Yu Zhonglei (2012) analyzed the influence factors of tourism development as the disturbance factor of social-ecosystem from perspective of tourism destination. There are two kinds of disturbance factors, risk and opportunity. And they also analyzed the adaptation behavior of the residents of tourism destination to the social-ecosystem [4]. Zhuo Fangyong (2016), from the perspective of residents and tourists, attaches importance to the interaction between the whole system and the internal elements, emphasizes the adaptation process of the "human" elements in the system to the tourist disturbance, and highlights the characteristics of human-place interaction and co-evolution [5]. Wu Jilin *et al.* (2017), guided by the relevant theories of social-ecosystem, studied four Chinese traditional village farmers' adaptation types, adaptive driving factors and adaptive mechanism in Zhang Jiajie under the background of rural tourism development by participatory rural evaluation (PRA) and its tools and multiple linear regression analysis [6]. Therefore, the research on the adaptability of the social and ecological environment changes in tourism destinations and the scientific understanding of the adaptation mechanism of relevant subjects and objects in

the social-ecosystem are the frontier directions and hot issues of the scientific development in the field of tourism, which are of great theoretical significance and application value. This paper aims to introduce the origin and development of the study on the adaptability of the social-ecosystem in tourist destinations, and summarizes the research direction of adaptability in the field of tourism development and points out the future development trend, in order to provide reference for the research on adaptability of social-ecosystem in tourism destinations.

2. The Scientific Connotation of Social-Ecosystem Adaptability

2.1. Social-Ecosystem Theory

The theory of social-ecosystem stems from the study of human-place relationship, which has always been the core and the most discussed field of geography. However, geographical research tends to ignore the humanistic factors in social science, just as social science research often ignores the natural environment factors. Therefore, the interaction between nature and humanity has always been the research direction that the academic circle tries to explore. Since the 1980s, more and more scholars have realized that should explore the coupling relationship of social system and ecological system, and discuss mechanism of mutually embed and coupling and common evolution between human society and natural environment under the framework of social-ecosystem [7]. It would be more fully on the overall analysis of the operation mechanism of regional human-place relationship. With the continuous attention of various disciplines on natural ecology and humanities and social science, Holling (2001) put forward the concept of social-ecosystem earlier. He believes that the social-ecosystem is a coupling system of human-place relationship formed by complex and dynamic natural ecosystems and social systems that are interdependent and closely connected, including the ecological environment within a certain space or geographical unit and its related social behavior subjects and institutions [8]. Gumming *et al.* (2006) also defined social-ecosystem as a complex system combining social and ecological aspects, an organism consisting of people and local interdependence, the society is “a interpersonal relationship of cooperative or interdependent with others or its peers” [9]. Due to the complexity of the social-ecosystem, the driving factors of internal and external disturbance can directly affect the system (such as changing the structure of the system elements), and also affect the system through the coupling of the system elements [10].

In the late 1990s, with the intensification of global climate change and environmental pollution, the concept of sustainable development of environment for people, achievements of multidisciplinary integration about human activities and environmental protection, the human-place relationship have gradually been researched by domestic and foreign scholars, the integration of social system and ecological system has gradually become the focus of the research of

sustainable development [11]. Berkes and Folke driven on by the royal Swedish academy of sciences launched “linking social and ecological systems” initiative, insist that should be the human social system and natural ecological system as a unified regional human-place relationship analysis framework, emphasis on ecology, geography, anthropology, economics and political science and other multidisciplinary fusion, It puts forward the idea of using social systems and ecological systems coupled to guide regional sustainable development [12]. In China, Ma Shijun (1984) proposed the concept of “society-economy-natural complex ecosystem”, expressing the idea of integrating human social-economic system with natural ecosystem [13].

It can be seen that the emphasis the research orientation on integrating the academic fields of ecology, anthropology and geography is an important theory to study regional human-place relations and sustainable development. In general, the core of the theory of social-ecosystem is to explore the regional human-place relationship from the perspective of system integration and integrate multidisciplinary fields, and to emphasize the local sustainable development, which is the result of the interaction and co-evolution between human and environment.

2.2. Adaptation Theory

The concept of adaptability originated in the natural sciences, especially in the study of evolutionary ecology. Later, Odum (1971) began to use the concept of adaptability to describe related concepts such as material, energy and information flow, such as resilience, equilibrium and adaptive governance [14]. This capacity of natural ecosystem is similar to that of human systems. Steward (1955) first applied the concept of adaptability to human systems, and utilized “culture adaptability” to described how “cultural cores” (a regional society) adjusted their behaviors according to the natural environment. This interpretation of adaptability extends the pressure that human systems need to adapt from pure biophysical pressure to a larger range [15]. O’Brien and Holland (1992) defined adaptability as “new or more advanced methods adopted by social groups in dealing with environmental problems related to their culture” [16]. The concept of the environment-social dual system reinforces the human adaptive response. Smit and Wandel (2006) giving a wider range of meaning for adaptability, they think that adaptability is a process, a kind of action, or as a result in the system of different scales (such as family, community, community, regional, national), when in the face of climate change, stress, disaster and risk or opportunity, system can be better able to cope with, manage or adjust [17].

At present, relevant concepts often involved in adaptability research are sensitivity, exposure, vulnerability, adaptability and resilience. These concepts are related to each other, but there are differences. Cui Shenghui *et al.* (2011) summarized and sorted out some basic concepts frequently involved. 1) Sensitivity refers to the degree of response to changes in conditions within, between and

among systems, and among complex systems, which may be harmful or beneficial. 2) Exposure: features and degree of changes in the environment faced by human-environment systems. 3) Vulnerability: the extent to which the system is vulnerable to or unable to cope with the adverse effects of climate change, including climate change rates and extreme weather events. 4) Adaptive capacity: in order to cope with actual or anticipated changes and their various impacts (unfavorable or favorable), adjust the natural and human systems and keep them in a certain state. 5) Resilience: the ability of the system to absorb interference and conduct structural recombination in the process of bearing variable pressure to maintain the basic structure, function, key identification features and feedback mechanism of the system without fundamental changes [18].

3. Research Status on the Adaptability of Social-Ecosystem and Tourism

In the field of sociology and anthropology, adaptive research is mainly about new or more advanced methods adopted by social groups in dealing with environmental problems closely related to their culture. The research area mainly involves demographic, economics and histology. The research on the adaptability of human and social system mainly focuses on three aspects: the adaptive object, the adaptive subject and the adaptive method. That is to answer the three core questions of “what needs to adapt”, “what to adapt” and “how to adapt” [18]. In the study of tourism social-ecosystem, Butler (1980) used the life cycle theory of tourism destinations to analyze the development process of tourism. He divided the life cycle of tourism destinations into four stages, with the first three stages of exploitation, development and protection, followed by three alternative stages of development: static or declining or renewal [19]. Gunderson and Holling (2002) proposed the concept of social-ecosystem of tourism, that is, tourism activities and their dependent ecological environment constitute a complex system that is closely related to the ecological environment and affected by both itself and external interference. At the same time, she put forward tourism social-ecological system, including the discrete event dynamic circulation mechanism and process driven four phases, in order to exploitation, conservation and release and reorganization four stages, constitute a adaptive cycle [20]. No matter which stage is in the systematic adaptive cycle, there is no exception in the process of tourism development “what needs to adapt”, “what to adapt” and “how to adapt”. Therefore, the adaptive research framework of social-ecological tourism-based systems needs to determine its adaptive objects, subjects and methods.

3.1. Adaptive Objects

Since the 19th century, the rapid development of the tourism industry has accelerated the development of the world economy. Excessive, predatory development has increased the contradiction between the development of tourism in-

dustry and between the tourism ecological environment. Environmental problems related the survival and development of tourist destination crowd frequency emerged, such as tourist natural resources consumption sharply, the extinction of wildlife, tourism crime, the destruction of cultural heritage tourism, the loss of cultural diversity, etc. In real tourism activities, a variety of nature or human society exists “interference” (such as earthquake, flood, economic crisis, the accessibility of speed change, the sudden increase of investment, political instability, etc.) will cause adaptive cycle to repeat or change, leading to loss or change of the original structure of tourism social-ecological system, form the phenomenon of interference Dun [20]. Xu Guangcai *et al.* (2008) divided the adaptive objects into spontaneous and artificial adaptation of natural ecosystem [21]. Therefore, the adaptive objects of the social-ecological system of tourism are mainly: 1) The consumption of natural resources such as ecological environment in tourist destinations. 2) Destruction of cultural resources such as tourism culture and loss of diversity; 3) Land use and development of tourist destinations; 4) Social issues such as tourism crisis and tourism ethics; 5) Regional political instability, social instability and the spread of infectious diseases caused by the above-mentioned ecological and social environment problems, as well as the issue of human responsibility in this issue.

3.2. Adaptive Subjects

Adaptive subjects under the background of global change is defined as the human ecological system by Bossel (1999), including natural system, support system and humanistic system, and natural system mainly including closely related to human environment and the resources system, support system including subsystems of economy and infrastructure, humanistic system including subsystems of the government, individual development and social subsystem [22]. The adaptive object of tourism social-ecosystem is mainly the supporting system and human system, focusing on the adaptation ability and strategy of human to cope with the impact of environment, land utilization, economic change and social change under the disturbance of tourism development. Petrosillo I. *et al.* (2007) simulated the dynamic mechanism of the interaction between the investments of ecological-tourists, mass tourists, ecological-environmental quality, accommodation and recreational facilities in the “social-ecosystem based on tourism activities” based on the system dynamics formula [23]. Zhuo Fangyong (2016) emphasizes the adaptability of the two types of subjects in ancient villages and tourists under the disturbance of tourism under the development of tourism, thus highlighting the unique value of human subjective initiative in the sustainable development of regional society and ecosystem [5]. In short, all political, social and economic sectors related to tourism (government, agriculture, forestry, water resources, etc.) will change their behaviors to adapt to the new environment in the context of tourism development. The subject of adaptation can be the social and economic sectors such as residents and tourists in tourist areas, tourism development and investment construction, administrative or

non-administrative departments such as governments, enterprises and social groups, natural, ecological and cultural systems, or the practice, operation and structure of the system.

3.3. Types and Methods of Adaptation

The theory of social-ecosystem adaptability focuses on that the adaptation of “human” elements in the system adjust themselves through a series of behavioral measures to deal the system risks when facing disturbance factors, so as to achieve the goal of sustainable development of the whole system. Smit defines adaptation strategies for short-and long-term climate change and extreme weather events to enhance the viability of social-economic activities and reduce vulnerability [24]. Therefore, according to the behavior mode of adaptation subjects, human adaptation can be divided into two types: ecological system adaptation and human adaptation. Feenstra *et al.* pointed out that the former focuses on the protection and maintenance of natural ecosystem functions, and human adaptation emphasizes the planned behavior of human society based on the cognition of what has happened, what is happening and what may happen, as well as the awareness of the possible consequences of taking actions [25]. From the perspective of the objects of adaptation, Xu Guangcai *et al.* (2008) classified human adaptation strategies into ecosystem adaptation and human adaptation. One is to intervene and regulate natural ecosystem artificially, so as to maintain the stability of ecosystem structure and function. On the other hand, people mitigate the impact of human activities on the environment by adjusting the structure of social production sector and technological progress [21]. According to this classification, the adaptation types of tourism social-ecosystem can be divided into two types: tourism ecosystem adaptation and tourism subject adaptation. The adaptation of tourism ecosystem refers to the intervention and adjustment of the natural ecosystem on which the tourism subject depends under the disturbance of tourism, so as to maintain the stability of the ecosystem structure and function of the tourism destination. The adaptation of tourism subject refers to the adaptation of tourism subject to deal with the impact of tourism development on the environment of tourist destinations through the adjustment of production structure, capital introduction, technical services and employment participation.

3.3.1. Adaptability of Tourism Ecosystem

With the deepening of the research on social-ecosystem, foreign tourism researchers have gradually noticed the important reference value of this theory to the study of tourist destinations. Relevant researchers regard tourist destinations as social-ecosystems with complexity and dynamics, and consider sustainable development as a dynamic process of development and change [26]. Farrell *et al.* (2004) first proposed to study tourism destinations as complex adaptive systems and theoretically analyzed their feasibility [27]. Patterson, *et al.* (2004) used the Dominican republic as an example to establish a tourism dynamics model inte-

grating environmental, social and economic systems to summarize the impact of different tourism development strategies [25]. Plummer R., *et al.* (2008) explored the adaptive comanagement mode of the reserve tourism area based on the theoretical framework of the social-ecosystem. Larson L. & Paul N. (2012) first used the adaptive management framework proposed by Holling as a management method of tourism sustainable development through the case study of Machu PICCHU(the polo Colosseum of Peru, world heritage) [4].

Cui Shenghui (2011) pointed out that human regulation and intervention of natural ecosystem can be carried out on three scales: gene, species and ecosystem [18]. In the tourism social-ecosystem, the adaptation behavior of the tourism subject to the change of ecological environment is mainly reflected in that human beings select and cultivate new species adapted to the growth of the tourism destination with purpose when facing the vulnerability of the tourism destination. To protect and cultivate endangered species artificially, and maintain the balance of the ecosystem of the tourist destination. For example, according to the natural ecological conditions of the tourist destination, it is set as a natural ecological protection zone of different levels, and tourists are planned and scientifically organized to avoid man-made destruction of the natural ecosystem. At the same time, the cultivation of endangered plants and animals is artificially selected to continue the diversity of natural genes and species according to the species status of natural ecological reserves. Under the new climate conditions, the natural disaster warning system and fire control system of the reserve shall be used scientifically to timely forecast the occurrence of disasters and adjust and control the damage to the natural ecological reserve. Specific adaptation strategies include the management of farmland, grassland and forest ecosystems, human damage and control of resource harvest. Yu Zhonglei (2012) pointed out that the risk faced by social-ecosystem under tourism disturbance is the degradation of available land, forest resources, living environment and food security [4].

3.3.2. Adaptability of Tourism Subject

The adaptability strategy of tourism social-ecosystem can be practiced on different scales in areas, countries and regions, and can also be paid attention to from the perspective of different tourism subjects such as residents, tourists, managers and operators. At present, most of the researches related to the social-ecosystem of tourism mainly focus on the local small scale, mainly focus on the human-place relationship of tourism destinations, and pay attention to the interaction between the whole system and the internal elements. The study emphasizes the adaptation process of the tourism subject within the system under the influence of tourism disturbance, highlighting the characteristics of human-place interaction and co-evolution. Meanwhile, Yu Zhonglei (2012) also found that tourism development provides opportunities for rural households in tourism destinations to improve their income and labor quality, and residents in tourism destinations can choose ways of participating in tourism or working

outside to adapt to local tourism development [4]. Wu Jilin (2017) to Zhang Jia-jie four traditional Chinese village farmers as the research object, summarizes the development of rural tourism under the background of 6 kinds of farmer's livelihood adaptation types: franchise of tourism, tourist dominated, tourist participation, migrant workers, the workers and peasants and balanced and farming, and participate in the tourism low proportion of farmers, farmers and workers in different degrees became one of the traditional village farmers to adapt to the livelihood of the tourism development strategy. The in-depth analysis found that the main adaptation factors that lead to the adaptation effect of farmers, besides the individual indicators such as the total labor force of farmers, household education, housing area, household savings, etc., are the fundamental causes of the adaptation of farmers' adaptation behaviors, including the imbalance of traditional village social-ecosystem, government policy system and livelihood capital [6]. These studies mainly take the tourism subject of tourism destinations as the passive recipient of the influence of tourism development and emphasize the influence of tourism development on tourism subject. However, it has relatively neglected the adaptation and adjustment ability of tourism subjects in coping with system changes, which is difficult to reflect the process of human interaction. Zhuo Fangyong (2016) made a micro analysis of traditional ancient villages and proposed that the promotion of mutual communication and joint participation between residents and tourists is the key to improving the adaptability of the social-ecosystem of ancient villages [4].

Therefore, the impact of the tourism subjects on the ecosystem depends on the sensitivity and vulnerability of the tourism destinations, the adaptability of the tourism subjects and the resilience of the tourism ecology. Petrosillo I. (2006) discusses the Salento area in southern Italy 10 social-ecosystem fragility conducted a quantitative research, proposed in view of the different types of tourism destinations (transitional, beach and culture) strengthen the restoring force, improve the adaptive management ability goal [3]. However, the current research perspective is only carried out from the perspective of a certain scale or a single subject related to tourism, and some is only launched from the perspective of a single factor within the system, lacking the discussion on the wholeness and correlation of the social-ecosystem of tourism. The research direction has certain limitations and lacks guiding significance.

4. Prospects for the Study on the Adaptability of Tourism and Social-Ecosystem

4.1. Strengthen Cross-Scale Research

Studies on the adaptability of tourism social-ecosystem have different degrees of research results on different scales. Under the influence of tourism disturbance, the tourism subject artificially interferes with the adaptation of the natural-ecosystem and the adaptation of itself to the ecosystem. These studies inevitably involve countries, regions or places. However, there are very few cross-scale

studies at present, and most adaptive studies only cover a single scale, such as a certain region or place. If combine the different scales of research, various, multilevel information collection, by means of comprehensive analysis, across the level crossing analysis of tourism ecology system and social system between evolution and interactions with problem, make quantitative conclusion more objective, thorough, and provide a more scientific basis for tourism administration departments.

4.2. Strengthen the Research of Different Subjects

The adaptability of tourism social-ecosystem reflects the adaptation and adjustment of the conflict and influence between residents, tourists, governments, enterprises and social groups and the social ecological environment in the context of tourism development. The subject of acceptance, intervention and adjustment of the social and ecological system changes in tourism destinations is not only limited to residents and tourists, but also plays an important role in the coupling effect of tourism operators, governments and other members of tourism destinations on the ecosystem and social system. Therefore, it will be one of the important directions for the future study of the social-ecosystem in tourism destinations to enhance the adaptability of tourism subjects in different levels to the social-ecosystem and comprehensively analyze the evolution relationship between natural ecology and social ecosystem of a tourism destination.

4.3. Strengthen the Research of Social Factors in the System

The development of tourism has many effects on the sustainable development of social-ecosystem. The present study is more based on a particular aspect of social factors in the system to study the influence of tourism destination and the actor, but the influence factors of tourism to social-ecosystem is extremely complex, a single social factors of deep research to analyze the system internal operation rules and system adaptability are the elements is of great significance. At the same time, in a single social factors based on in-depth study, strengthen the social-ecosystem in the interactions between the various and multilevel social factors, to understand the overall system operation and comprehensive adaptability provides ample theoretical basis, to promote the sustainable and healthy development of the tourist destination social-ecosystem has important guiding significance.

4.4. Strengthen Research at the City Level

Most tourism destinations are located in remote rural areas with poor economic development and better ecological preservation. With the development of mass tourism and leisure tourism, the scale of urban tourism has great influence on urban areas. Although urban than in rural areas, economic, cultural and social diversity to tourism disturbance effect has strong inhibition and control force, but tourism developing city inevitably faced with resource utilization, environ-

ment pollution, the occurrence of crime, such as the contradiction and conflict, the serious influence city sustained and healthy development of the tourism destination social-ecological adaptability. However, most researchers do not pay attention to the adaptability of social-ecosystem on city scale under the disturbance of tourism.

5. Conclusion

Adaptability refers to the adjustment of social-ecological system in operation to actual, perceived and expected environmental changes and their effects [13]. On the basis of expounding the theory of social-ecosystem, this paper summarizes the research status of tourism social-ecosystem at home and abroad. At the same time, this paper discusses the three perspectives of “adaptive objects”, “adaptive subjects” and “adaptive types and methods”, and mainly introduces the relevant objects and their mutual relations related to the adaptability of the tourism ecosystem and tourism subjects. On this basis, the application field of tourism social-ecosystem is further analyzed. The main conclusions are as follows: 1) Tourism social-ecosystem is mainly concerned with the adaptability selection and response of the tourism subject and the social environment in which the tourism is disturbed. It is an analytical theory that emphasizes the relationship between human and place. 2) The adaptability of the social-ecological system of tourism includes the adaptation of the tourism subject to human intervention of the natural ecosystem and their adaptability to the ecosystem. These disturbances act on the self-movement of the tourism social-ecological system and push the system into a larger scale of circulation. 3) The social-ecosystem theory is an important theoretical support to evaluate the sustainable development of tourism destinations, and its application fields include tourism development and planning, tourism poverty alleviation, etc. The ultimate aim of finding out the cycle mechanism of tourism social-ecological system, and measuring the resilience is to establish an effective adaptive management mechanism, strengthen the tourism activities in the various stakeholders to establish learning ability, ability to work together and the resilience to respond to interfere, and promote the system of resource management, prevent disaster and sustainable development [16]. The development of tourism may increase the load of the eco-environmental system of the tourist destination. It may also create superior conditions and opportunities for tourism destinations. This theory can analyze the important issues in the development of tourism and the relations between these issues. It also emphasizes the cross-interaction between different factors in the tourism social-ecosystem.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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