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# A Review of Evaluation Studies on Tourism Suitability

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**Abstract** In order to fully understand the development trends and achievements of tourism suitability evaluation at home and abroad, this paper reviews the relevant literature of tourism suitability evaluation from five aspects—tourism climate, tourism environment, tourism resources, tourism destination and evaluation indicator, and gives discussions.

**Key words** Tourism Suitability, Evaluation studies, Review

## 1 Introduction

Suitability evaluation was initially used in the field of land use research to judge whether the land is suitable for development in a predetermined way of use. The research on this aspect began earlier in foreign countries. Since the 1960s, McHarg<sup>[1]</sup>, an American planner, began to study land suitability assessment. As the *Outline of Land Evaluation* issued by the Food and Agriculture Organization of the United Nations (FAO) in 1976 elaborated the evaluation methods, steps and results expression of land suitability, the domestic research on land suitability evaluation began to be carried out on a large scale and systematically. With the vigorous development of tourism, scholars begin to pay attention to the related research on tourism suitability. Foreign countries first began to study the suitability of tourism climate. The domestic research on tourism suitability evaluation began at the end of the 20<sup>th</sup> century, and started relatively late, but the development speed is relatively fast, and the purpose of tourism suitability evaluation is to provide spatial guidance and scientific basis for tourism development and tourism site selection in various areas and to promote the sustained and healthy development of tourism destinations.

## 2 Research progress of tourism suitability evaluation

**2.1 Content of tourism suitability evaluation** According to the research content of tourism suitability, the research of domestic and foreign scholars on tourism suitability evaluation mainly includes the following aspects:

**2.1.1 Study on tourism climate suitability evaluation.** Climate is the key factor that affects people going to tourist destinations to carry out tourism activities<sup>[2]</sup>. In the early days, foreign scholars Terjung<sup>[3]</sup>, Oliver<sup>[4]</sup> and Mieczkowski<sup>[5]</sup> *et al.* studied the tourism climate comfort, put forward the concepts of comfort index, wind effect index, humidity-temperature index and wind-cold index and constructed an evaluation model. So far, some domestic scholars

have learned from the relevant research of foreign scholars, and the research results on the suitability of tourism climate have been gradually enriched. Sun Gennian and Ma Lijun<sup>[6]</sup> used comfort index and wind effect index to analyze the annual changes of tourism climate comfort in Xi'an and its surrounding mountains, and used OLS method to study the correlation between tourist flow and climate comfort in Xi'an. He Ying<sup>[7]</sup> used temperature-humidity index and wind-cold index to evaluate the suitability of tourism climate resources in Xinjiang, analyzed the difference of tourism climate between northern and southern cities in Xinjiang, and compared the tourism suitability differences between Xinjiang and inland cities. Tourism Climate Index (TCI) is also widely used in the measurement of climate suitability assessment of tourism destinations. Fitchett JM<sup>[8]</sup> made studies based on the changing trend of TCI index of 18 tourism destinations in South Africa from 1995 to 2015, and the results showed that the TCI index of most locations in South Africa had no significant change and was suitable for sustainable tourism development. Hassan *et al.*<sup>[9]</sup> compared the TCI index with the temperature-humidity index (THI) in Dezful, and the results showed that the TCI index was more refined and comprehensive in terms of climatic suitability.

**2.1.2 Study on environmental suitability evaluation of tourism destination.** The environmental suitability of tourism destination is one of the main factors affecting the development of tourism destination. Tourism environment, especially ecological environment, is becoming more and more important to tourism development<sup>[10]</sup>. Scholars have carried out relevant research in this area. Chaplin *et al.*<sup>[11]</sup> assessed the impact of tourism on forest cover in Annapurna by comparing Landsat images from 1999 to 2011 and found a net increase in forest cover in the north and a net decrease in forest cover in the south, indicating that the impact of tourism activities on forests was volatile. Domestic scholars pay more attention to the eco-environmental suitability of tourism development in ecologically fragile areas. Zhang Zhenguo *et al.*<sup>[12]</sup> took Dongsheng District, Ordos City, Inner Mongolia as an example, and used GIS technology and remote sensing technology to spatially analyze the suitability of its ecological environment for tourism development. In order to promote the protection of ecological environment, Shi

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Yao *et al.*<sup>[13]</sup> put forward a method system for evaluating the spatial suitability of tourism development in ecologically sensitive mountain areas, and selected Wudangzhao Scenic Tourism area in Inner Mongolia as a case area to verify. Song Xiaolong *et al.*<sup>[14]</sup> used GIS technology to establish an ecological sensitivity evaluation model combined with habitat suitability evaluation and human disturbance characteristic analysis to evaluate the ecological renewal of national nature reserves in the Yellow River Delta.

**2.1.3** Research on suitability evaluation of tourism resources development and planning. With the popularization of the concept of eco-tourism, foreign scholars pay more attention to the suitability of eco-tourism development. Ariani *et al.*<sup>[15]</sup> studied the suitability and carrying capacity of marine eco-tourism development in Medang Deras area. Mobaraki *et al.*<sup>[16]</sup> evaluated the eco-tourism suitability of Iran Isfahan townships based on GIS and AHP methods. Zabihi *et al.*<sup>[17]</sup> comprehensively evaluated the suitability of eco-tourism attractions in Gbagbo, Iran based on GIS and F-AHP. The domestic scholars did research on the suitability of tourism resources mainly from the development of different types of tourism resources, analyzed its suitability, made an empirical discussion on typical cases, and highlighted the practical significance of theoretical research. Li Tao<sup>[18]</sup>, Wang Zhen<sup>[19]</sup>, Kong Lingyi<sup>[20]</sup> and Zhang Xueying<sup>[21]</sup> *et al.* evaluated the suitability of natural tourism resources such as leisure agricultural tourism resources, ecological health conservation tourism resources, coastal health tourism resources and ice and snow tourism resources respectively. Sun Yehong *et al.*<sup>[22]</sup>, Chen Wei and Wen Dongni<sup>[23]</sup>, Chen Wei and Zhang Lulu<sup>[24]</sup>, Wang Lingen *et al.*<sup>[25]</sup> analyzed the development suitability of emerging tourism resources, such as agricultural cultural heritage tourism resources, ethnic minority traditional sports tourism resources, intangible cultural heritage tourism resources and self-driving tourism resources respectively.

**2.1.4** Research on suitability evaluation of tourism destination. With regard to the research on the suitability evaluation of tourism destinations, scholars generally focus on the type and scale of regional tourism resources and generally take research steps including the indicator system construction, weight coefficient determination, evaluation method selection, empirical analysis, and measure discussion. Based on RS data and GIS technology, Fang Yan and Yin Jie<sup>[26]</sup> selected five evaluation factors—night lighting, land use status, topographic elevation, atmospheric aerosol and national historical and cultural cities, and carried out spatial operation after giving different weights to evaluate the suitability of tourism destinations. Based on the relevant influencing factors of leisure agricultural park tourism, Liu Yuhua<sup>[27]</sup> used the AHP-fuzzy comprehensive evaluation method to analyze the development suitability of university agricultural park tourism resources. Zhang Jianguo and Pang Zan<sup>[28]</sup> constructed an indicator system for evaluating the suitability of urban river tourism development, determined the indicator weight by analytic hierarchy process, and carried out empirical research on five urban rivers in Shaoxing. Zhang Wenqiang and Sun Congjian<sup>[29]</sup> constructed the indicator

system of summer tourism in Shanxi Province from two aspects of climatic factors and topographical conditions, and determined its weight, and selected the most suitable summer resort in Shanxi Province based on spatial analysis technology.

**2.2 Evaluation indicators of tourism suitability** The selection of tourism suitability evaluation indicator is mainly based on natural resources, social and ecological environment and other influencing factors. Ullah<sup>[30]</sup> assessed the tourism potential of coastal landscapes in southern Pakistan based on 26 indicators. Turgut<sup>[31]</sup> developed a forest road hiking suitability indicator based on six main parameters—route length, slope gradient, altitude, slope aspect, walking time, landscape quality and access to clean water. According to the relevant research experience of foreign countries, some domestic scholars have put forward all kinds of tourism suitability evaluation indicator systems. Zhang Beier and Huang Xiaoxia<sup>[32]</sup> constructed the suitability evaluation indicator system of recreation tourism from six aspects: hardware facilities, health care tourism service ability standard, public service system, health care tourism service project, talent distribution and characteristic service experience of health care tourism in order to clarify the various concepts of health tourism and promote the development of health tourism industry. He Xiaohong<sup>[33]</sup> constructed the evaluation indicator system of mountain sports tourism from four aspects—tourism resources conditions, environmental conditions, climate comfort, location and socio-economic conditions, and determined the suitability grade of Guiyang City, Guizhou Province by means of entropy weight method and GIS technology. Geng Shufeng *et al.*<sup>[34]</sup> constructed a green tourism suitability evaluation indicator system from three areas—green basic resources, economic development and tourism potential, and carried out a spatial analysis of the distribution of green tourism resources in China based on GIS software. Sun Jing *et al.*<sup>[35]</sup> constructed the suitability evaluation indicator system of marine tourism from three aspects—the basis of marine tourism resources, the current situation of marine tourism development and the development potential of marine tourism, and conducted a comprehensive analysis of the suitability of building a national marine tourism base in China's coastal areas.

### 3 Review and prospects of the research on tourism suitability evaluation

**3.1 Review of research** After decades of development, the research content of tourism suitability evaluation at home and abroad is gradually diversified, and the research results of tourism climate, tourism environment, tourism resources and tourism destination are becoming increasingly rich. The selection of suitability evaluation indicator is also more scientific and comprehensive. In the empirical research, some scholars also increase the regional characteristic indicators in accordance with local conditions, and the research areas range from large areas such as country, region and province to small spatial scales such as village and scenic spot. The rich research results provide some theoretical support

and method reference for the related research in the future.

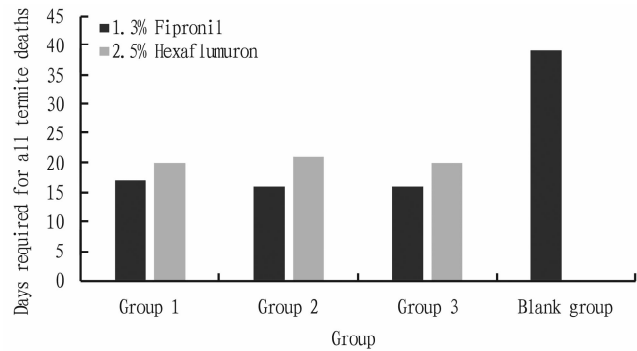
**3.2 Research prospects** Although the academic circles have conducted a more in-depth study on the suitability of tourism development, there are still some deficiencies. First of all, the introduction of expert scoring in the construction of the indicator system and determining the weight of factors will not avoid the intervention of human factors, which will increase the subjectivity of the evaluation results to a great extent, and the human intervention should be reduced in the following research to ensure the objectivity of the results. Secondly, most of the existing studies choose a certain aspect of the tourism destination for suitability evaluation, such as ecological environment, tourism resources and climate suitability, but lack more comprehensive research on the suitability of tourism destinations. The subsequent study should comprehensively consider all factors affecting the development of tourism in the region, and carry out a more comprehensive study on tourism suitability.

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1.3% Fipronil and 2.5% Hexaflumuron bait respectively in each group, and wet them with 15 mL of tap water. Put 90 termite workers and 10 soldiers in each Petri dish, cover them, and put them in a dark room at about 28 °C with relative humidity (RH) of 82%. Take another Petri dish and set a blank control with pine sawdust. Check it once a day to record the death of termites.

The test analysis is shown in Fig. 2. The average time required for the death of all terrestrial scattered termites is 16.3 days, and the average time required for the death of all termites in the Petri dish after workers take bait is 20.3 d. The natural mortality of the blank control group was 6% and 5%, respectively. Therefore, it can be concluded that 1.3% Fipronil has a strong killing effect on terrestrial termites, and 2.5% Hexaflumuron has a toxic effect on terrestrial termites. And from the test results, it can be seen that 1.3% Fipronil is better than 2.5% Hexaflumuron in killing subterranean termites.



**Fig.2 Days required for all termites to die in the laboratory test 1.3% Fipronil bait and 2.5% Hexaflumuron bait**

5 Conclusions

Powder spraying method and bait method have played a great role in agricultural termite control. Among them, Fipronil has significant effects on termite trapping. An appropriate amount of bait can increase agricultural production value, but it is worth noting that excessive bait will also have certain side effects on agricultural products. In view of the fact that the control effect of different chemicals on termites is slightly lower in this study, it may be due to errors caused by humidity, temperature and other factors. Therefore, it is speculated that the dosage of chemicals required in

different regions should be controlled according to various local factors.

Termites can damage the root system of crops, causing seedling shortage and ridge breakage. Early detection, early treatment and early prevention should be achieved. Local governments should actively respond to the rural rejuvenation strategy, and use high-tech to monitor and protect ants and take monitoring control technology to monitor termite activities of ancient and famous trees and their surrounding environment for a long time to reduce the risk of termite invasion<sup>[8]</sup>. At the same time, we should also strengthen policy guidance and implement management measures. Implement the policy of prevention first, combination of prevention and control, and comprehensive treatment, closely combine termite control with rural development, improve the rural landscape, increase the rural economic development index, and take the road of sustainable development.

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