

## Ecological compensation standards of national scenic spots in western China: A case study of Taibai Mountain

Yi Yang\*, Congxu Yao, Delong Xu

School of Economics and Management, Xi'an University of Technology, Xi'an, 710054, China



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### ABSTRACT

One of the impacts of tourism activities on national scenic spots in western China is that local residents have lost some of their rights to benefit from natural resources. The establishment of reasonable ecological compensation standards is an important means of addressing the contradicting interests of stakeholders. Using the ecological footprint (EF) method, the compensation standard for local residents is determined based on a measurement of the touristic ecological footprint (TEF) of the Taibai Mountain scenic spot (TMSS) and the EF of Tangyu Town. The results show that the TEF of the TMSS in 2015 was 13,803.66 ha, the EF and the biological capacity (BC) of Tangyu Town were 83,879.71 ha and 61,722.96 ha, respectively. Thus, the per capita ecological compensation standard is USD 465.76. This study proposes measures to reduce the TEF, improve the implementation of the compensation mechanism and effectively raise funds for ecological compensation.

### 1. Introduction

Most of the state-level scenic spots in western China are located in poor areas. At the beginning of the 21st century, the development of the tourism industry in China brought considerable social and economic benefits to the local area. Tourism especially promoted the employment and livelihood of the local poor (Shi, 2003). The Sustainable Tourism-Eliminating Poverty (ST-EP) initiative proposes the development of tourism to actively eliminate global poverty (World Tourism Organization, 2017). In the Action Plan for Rural Tourism Poverty Alleviation Project, which was promulgated in 2016, the Ministry of Culture and Tourism of China proposed that tourism promotes local economic development and drives local residents to wealth (Ministry of Culture and Tourism of China, 2016). For example, through the development of tourism in Sichuan Province, more than 10% of the poor have been lifted out of poverty, and the number of people out of poverty has reached more than 0.5 million (Li, 2015a). During the Twelfth Five-year Plan period, 0.6 million people in Shaanxi Province achieved poverty alleviation through the development of tourism, accounting for 15% of the poverty alleviation in the province (Li, 2015b). The development of tourism is becoming an effective way to alleviate poverty in poor areas (Akinboade & Braimoh, 2009; Steiner, 2006; Truong, Hall, & Garry, 2014).

Western China has unique tourism resources, especially natural landscapes such as forests, grasslands, mountains, rivers and lakes with

aesthetic value. However, short-board problems, such as the infrastructure and public services of the tourism industry in western China, make it difficult to meet the growing demand for tourism. In addition, these problems exacerbate the eco-environmental stress caused by local domestic garbage, water pollution and air pollution. Due to the special geographical environments of scenic spots, the development and utilization of these natural resource landscapes affect the production and life of the local residents. Land expropriation, ticket income distribution, tourism management rights, house demolition and other conflicts are important issues (Wang & Yotsumoto, 2019). The residents in these areas have few sources of livelihood, low income, and weak resistance to risk. Tourism activities have intensified the contradictions between ecology, economy and society (Pan et al., 2018). Therefore, to facilitate ecological management and restoration, ecological compensation for local residents is necessary.

The Taibai Mountain scenic spot (TMSS) is a typical case of tourism resource development in western China. The TMSS was originally a state-owned forest farm, and workers depended on logging for a living. After nearly 20 years of development, the TMSS has been rapidly developed, and the economic benefits have been remarkable. However, after the establishment of the scenic spot, to protect the ecological environment, logging was no longer allowed, and many employees were unemployed. Although the Shaanxi Taibai Mountain Tourism Management Committee (Management Committee) provides employment positions, it is seasonal employment and the pay is less. At the

\* Corresponding author.

E-mail address: [yangyi\\_nwpu@163.com](mailto:yangyi_nwpu@163.com) (Y. Yang).

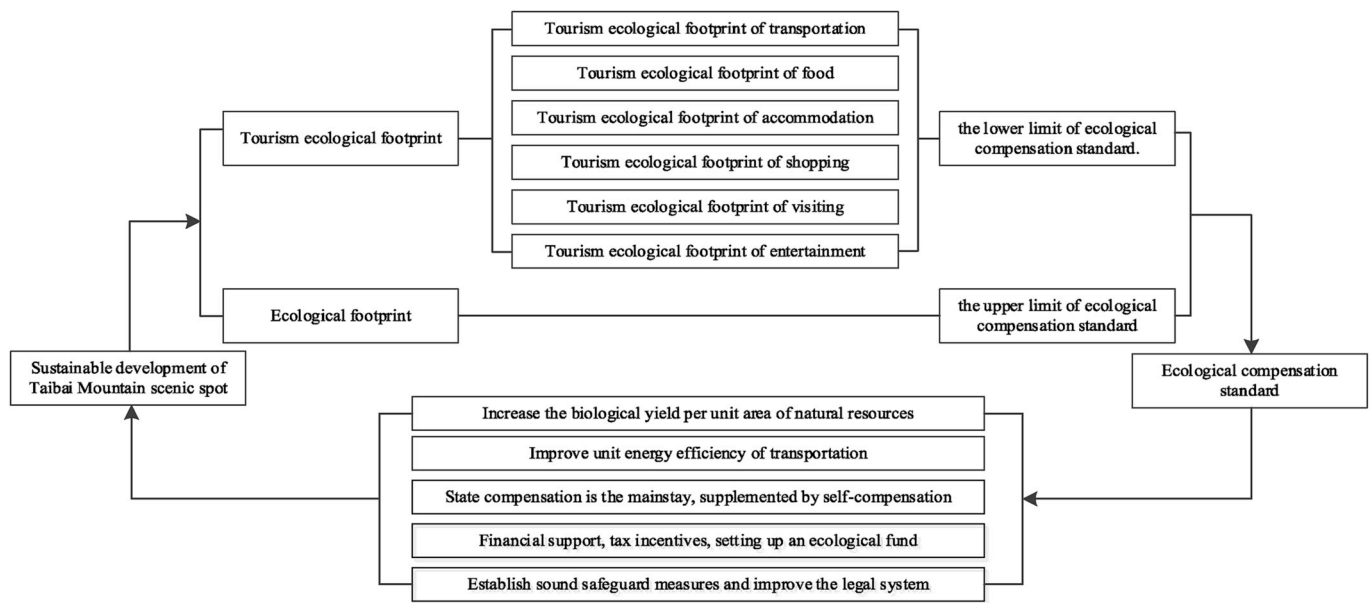


Fig. 1. Research framework.

same time, the construction of tourist attractions has caused the local residents who live on the mountain to migrate to the foot of the mountain. These residents have not only lost the right to benefit from the mountain but also occupy the natural resources of the residents who already lived at the foot of the mountain. The TMSS occupies the local resources but does not compensate the local residents, which easily causes social problems. To this end, the local residents are the compensation recipients, and the touristic ecological footprint (TEF) concept can be applied to explore the ecological compensation standards applicable to the TMSS. This approach cannot only alleviate social conflicts, encourage scenic ecological construction and stimulate environmental protection but also promote sustainable development and improve the utilization of local tourism resources (Fig. 1).

## 2. Literature review

Ecological compensation is an incentive and solution to coordinate the contradictory interests of ecological stakeholders and alleviate the environmental pressure on a destination (Yu & Xu, 2016). The stakeholders of tourism destinations include government, enterprises, tourists, and community residents (Zhang, Zhang, Liang, Li, & Liu, 2005). These stakeholders have significantly different opinions regarding the development of tourism and environmental protection (Liu, 2006). The establishment of ecological compensation standards can reduce the consumption and occupation of ecological resources, and measures can be taken to reduce environmental pollution and damage, which will help demonstrate the value of ecological services and raise people's awareness of ecological protection. To embody the principle of fair cooperation in terms of benefit sharing and reciprocity of power and responsibility, the implementation of ecological compensation should consider the public's environmental awareness and the long-term impact on residents' livelihood (Alves-Pinto, Hawes, Newton, Feltran-Barbieri, & Peres, 2018; Seroa da Motta & Ortiz, 2018; Ouyang, Zheng, & Yue, 2013; Seroa). Ecological compensation is a supplement to a strong legal framework for the conservation of biodiversity and ecosystems (Koh, Hahn, & Ituarte-Lima, 2017). Some countries or regions have carried out ecological compensation practices in the areas of water environment management, agricultural environmental protection, afforestation, carbon cycle, protection and restoration of the natural environment (Pagiola, 2008; Dobbs & Pretty, 2008; Duesberg, Dhubbáin, & O'Connor, 2014; Zhang & Wei, 2010; Ministry for the Environment,

2000).

The returning farmland to forests project is by far the largest ecological construction project in China. The project funds invested by the government have exceeded USD 51.95 billion. This project represents the first time that China adopted compensation measures for large-scale ecological construction projects. The project provides subsidies for food and living expenses to farmers who return farmland and provides farmers with a seedling afforestation subsidy of 90.68 USD/ha. China confirmed ecological compensation as an important part of the constructed system by proposing the goal of constructing an ecological civilization in April 2015. The current ecological compensation practices are usually conducted in forests, grasslands, wetlands, water sources, and mines (Gao, Kinnucan, Zhang, & Qiao, 2016; Guan, Liu, & Chen, 2016; Liu, Yang, & Min, 2018; Sheng, Zhen, Xie, & Xiao, 2017; Yu, Xu, & Wang, 2016). However, difficulties have been encountered during the implementation of ecological compensation in China's tourism industry. The main difficulties are as follows: On the one hand, the development of tourism and the adoption of environmental protection measures have changed the original land use pattern. The compensation reflects the value of only the original land use, that is, the opportunity cost generated by the local residents who choose to abandon the original land use. On the other hand, the compensation recipients for the existing ecological compensation projects for scenic spots are generally the local government, subdistrict office or management agencies of the scenic spots. Due to the lack of ecological compensation for local residents, the imbalance of local residents' interests has affected the environmental protection and regional development of tourism. Environmental construction, value-added ecological services and regional poverty alleviation can all be benefitted by studying the development, utilization and protection of scenic spots while simultaneously exploring the establishment of ecological compensation standards for local residents.

At present, the main methods for determining ecological compensation standards are the opportunity cost method, willingness to pay method, ecosystem service value method, and ecological footprint (EF) method (Ding, Zhou, Mauerhofer, Zhong, & Li, 2019; Kong, Xiong, & Zhang, 2014; Li, Miao, Zheng, Ouyang, & Xiao, 2009; Zhou, Guan, & Zhou, 2018). The EF is a method to evaluate the state of biological capacity (BC) based on the measurement of the difference between ecological supply and demand (Rees, 1992). As an important way to measure the degree of sustainability of a region or industry, the EF

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