

## Research Article

### Research on the Sustainable Development between Tourism Resources and Environment in Tsinling Mountains

Yi Li

School of History and Culture, Yan'an University, Yan'an 716000, China

**Abstract:** The study aims to investigate the sustainable development strategy between tourism resources and environment in Tsinling Mountains, China. To plan the tourism construction rationally, it is very important to implement effective environmental sustainable development strategy to protect tourism resources. Therefore, the sustainable development strategy for a reasonable tourism resources planning in Xian area of Tsinling Mountains is presented in this study. The tourism ecological footprint investigation was firstly carried out for the Xian area of Tsinling Mountains. Then a survey was conducted to assess the perception on the ecology in the Xian area of Tsinling Mountains. The investigation results demonstrate that the sustainable development and ecology security have been threatened in the Xian area of Tsinling Mountains and the local residents are not satisfied with the Living environment. Hence, some constructive suggestions and useful solution strategies have been proposed in this study for effective environmental sustainable development for the Xian area of Tsinling Mountains.

**Keywords:** Environmental sustainable development, tourism resources, tourism ecological footprint, Tsinling Mountains

#### INTRODUCTION

As well known, Tsinling Mountains is a diverse biological and ecological system, which can give us good impression. So it is one of the ideal areas for traveling. But at present the ecological environment is very vulnerable by human strong interference activities. Therefore the resources and environmental sustainable development of Tsinling Mountains has become popular for academic research. The research on mountains resources environment or seaside tourism started later in China than other country, the comprehensive research is also limited. Some scholars have done the general survey on mountains and seaside tourism resources since 1980s and some ecological system recovery and reconstruction research have made achievements, but the research of people's perception on the tourism resources environment is still blank. How to measure the bearing capacity of ecological environment and sustainable development level effectively becomes the focus of the research.

In order to investigate the sustainable development strategy between tourism resources and environment, the Tsinling Mountains is chosen for research in this study. The ecological footprint which can measure the influence of the urban tourism industrial development on the natural, social and ecological environment were applied as directly effective tool to research the sustainable development. At the same time the research is hope to provide reference for the tourism resources and environment.

#### TOURISM ECOLOGICAL FOOTPRINT IN XIAN AREA OF TSINLING MOUNTAINS

Tourism ecological footprint ( $F_{TE}$ ) is refer to that the various fossil energy, biological resources and the emissions generated by tourists in the tourism activities in a certain time, space area translate into the corresponding productive land area. Hunter (2002) put forward the definition of tourism ecological footprint and used in tourism sustainable development research firstly. Cole and Sinclair (2002) have analyzed the tourism ecological footprint in Asian economic non-developed area. Wackernagel and Yount (2000) and Gossling (2001) have discussed the tourism elements of the ecological footprint and tourist sustainable development. The tourism ecological footprint ( $F_{TE}$ ) based on the ecological footprint theory can directly measure the ecological consumption in tourism activity from the macroscopic perspective, at the same time also can indirectly assess the influence of six factors of the tourist activities on the environment of tourism destination. It is necessary to set up the tourism ecological footprint model fit for Xian area of Tsinling Mountains which is based on tourism activities consumption characteristics and including six elements of tourism activities. The constructing model is described as follows:

$$F_{TE} = F_{TET} + F_{TEA} + F_{TES} + F_{TEF} \quad (1)$$

where,  $F_{TET}$  denotes the tourist traffic group,  $F_{TEA}$  denotes the tourist lodging group,  $F_{TES}$  denotes the tourist shopping, tour and entertainment group,  $F_{TEF}$  denotes the tourist catering group.

**The tourist traffic group:** The distance resistance may hinder the tourists' perception of the tourist destination and personal travel decision. The use of average travel distance is often applied to reflect the influence the resistance degree. As known the air travel is the earliest development way which can reduce the resistance influence to the tourists at home and abroad. According to the relevant research different kinds of transportation ecological footprint can be expressed as: long airplanes for the  $2.93 \times 10^5$  hm<sup>2</sup>/kmp, trains for the  $1.74 \times 10^5$  hm<sup>2</sup>/kmp, cars for the  $1.70 \times 10^5$  hm<sup>2</sup>/kmp (Zhang *et al.*, 2010). The traffic group model is the products of the ecological footprint of tourists travel distance and the average consumption per km of traffic tools:

$$F_{TET} = \sum(N_j \times D_j \times M_j) \quad (2)$$

where,

$N_j$  = The tourists number of the  $j$  kinds vehicle  
 $D_j$  = The average travel distance of the  $j$  kind's vehicle  
 $M_j$  = The average ecological footprint of the  $j$  kind's vehicle

**The tourist lodging group:** Tourism ecological footprint is including the energy consumption in the process of service provided by hotel accommodation and the related products consumption provided by meals and Xian hotel construction area. At present Xian has owned more than 500 hotels and the emissions of pollutants have difference obviously, if the hotels are divided into three types, the built area of unit bed and the energy consumption are taken ecological economy data, then the model are as follows:

$$F_{TEA} = m \sum(N_i \times S_i) + n \sum(364 \times N_i \times B_i \times C_i / r) \quad (3)$$

where,

$m, n$  = The equilibrium factors of the built area and fossil energy  
 $N$  = The bed accommodation number of the  $i$  kinds  
 $S_i$  = The built area of the each bed of the  $i$  kinds  
 $B_i$  = The accommodation facilities utilization rate of the  $i$  kinds  
 $C_i$  = The each bed energy consumption of the accommodation facilities of the  $i$  kinds

**The tourist creating group:** The team tourists are the target customers for Xian area of Tsinling Mountains. The team catering arrangement stands for the main consumption type for tourist to Xian area of Tsinling Mountains. At the same time the tourists' consumption is the similar to the local residents. Assuming that both are consistent, the calculation are including the

productive area of the catering consumption and the biological and fossil energy area consumed by catering institutions services.

$$F_{TEF} = \sum S + \sum N \times D \times (F_i / a_i + C_i / r) \quad (4)$$

where,

$N$  = The number of the tourists  
 $D$  = The travel time  
 $F_i$  = The daily consumption of the  $i$  kinds food  
 $a_i$  = The average productivity of biological productive land of the  $i$  kinds  
 $C_i$  = The energy density of the  $i$  kinds food

**The travel shopping, tour and entertainment group:** The travel shopping model in general is as:

$$F_{TES} = \sum S_i + \sum (M_i / a_i) \quad (5)$$

where,

$S_i$  = The built area of the each mall of the  $i$  kinds  
 $M_i$  = The facilities utilization rate of the  $i$  kinds  
 $a_i$  = The energy consumption of the facilities of the  $i$  kinds

As we known, Xian area of Tsinling Mountains is a famous place which can integrate natural and humanistic landscape into unified entity. In order to meet happy experience demands, the tourists to Xian area of Tsinling Mountains may participate in performance activities.

## SURVEY INVESTIGATION

**Survey on the Xian area of Tsinling Mountains:** Tsinling Mountains crosses central China with a total length of about 1,500 km. It starts from south Gansu province, passes from southern Shaanxi province to the west Henan province. Its prevalent elevations are about 1,000 m and the highest point is 2,158 m. Tsinling and Huai River form the most important boundaries of the north and south in China and the Tsinling is also respected as a dragon vein of Chinese civilization.

The survey has been organized by some universities in China investigate the perception on the ecology in the Xian area of Tsinling Mountains. The respondents were selected sampling method. They mainly resided in the Xian area of the Tsinling Mountains. 300 questionnaires were sent out and 256 of them were returned. The recovery rate was 85.3%. Effective responses were 243. The survey aimed to inspect the perception on the relationship between the tourism resource and environmental in the Xian area of the Tsinling Mountains.

**Sample distribution:** The 80% of the respondents have been lived in the Xian area of the Tsinling Mountains for more than 20 years. In the effective responses, he

Table 1: The perception on the ecology in the Xian area of Tsinling mountains

Question	Answer				
Living environment happiness degree Rate	Very happy 12.2%	Happy 20.6%	Common 55.8%	Not happy 11.4%	
Importance of Tsinling Rate	Yes 38.6%	Common 50.1%	No 5.3%	Other 6.0%	
Environment protection Rate	Very care 11.5%	Common 77.3%	Not care 6.7%	Other 4.5%	
Effort to protect environment by local government Rate	Come Incentives 18.2%	Media propaganda 16.4%	Special agency 26.3%	Funding project 18.4%	No effort 20.7%

who has the high school degree of education or higher was 43.2%, junior high school degree of education or lower was 56.8%. This high rate of high degree of education can provide deep and reliable perception on the ecology changes of the Tsinling Mountains.

### ANALYSIS RESULTS AND DISCUSSION

The ecology footprint calculation method mentioned in above section was applied to the statistical data in the Xian area of the Tsinling Mountains. The statistical data was obtained from the reports of China's statistics office. The calculation results was that the ecology footprint per cap. Were 1.7365 hm<sup>2</sup> and the ecology capacity per cap? Was 3.262 hm<sup>2</sup>. The results show that the ecology capacity is relatively low when compared with other areas in China. That means the sustainable development and ecology security have been threatened.

Table 1 gives the survey result of the perception on the ecology in the Xian area of Tsinling. It can be seen that the local residents are not satisfactory with the Living environment.

Only 13 respondents know the protection objects in this questionnaire. Hence, the residents have poor knowledge about the tourist environment and Ecological Functions. It can infer that the local government doer not do enough work with the media propaganda. However, with the rapid increase of the population, hazy awareness has been emerged on the sustainable development. It also suggests the following conclusions.

- Excessive human activities in Tsinling tourism have dropped the ecological quality.
- In Tsinling tourism resources and environment have been being influenced by many factors and first and second influence factor are the industrial and domestic pollutants.
- Ecological protection awareness is weak. The government still needs to strengthen the propaganda.

### CONCLUSION AND SUGGESTIONS

- **Promote the transition of the industry, the development of tourism agriculture, tourism**

**industry actively:** First, strengthen the training to the Xian Tsinling farmers in the ecological region, enterprise employees, so it can be scientific planting and breeding, development of green, efficient sightseeing agriculture, to provide new leisure tourism resources in Xian Tsinling. Secondly, strengthen the enterprise staff's training and education ecological development zone in Xian Tsinling, to speed up the enterprise transformation. Make a small, loosen and disorder enterprise into a clean, modern tourism industry enterprise.

- **Clear functional partition, ensure nature reserve:** Use the comprehensive management concept to ecological function division in Xian Tsinling, especially for nature reserves protection to improve the ecological protection legislation, institutional setup, capital investment, supervision and evaluation, etc. Expand the species on the basis of ecological nature reserve of the appropriate development of ecological tourism.
- **Improve residents voluntarily to protect the tourism resources and environment:** Government departments shall publicize and educate tourism knowledge through various channels in the Xian Tsinling. Make ecological environment protection regulations, policies or measures, make the correct guidance of reasonable use of ecological tourism resources in Xian area of Tsinling Mountains. They can produce some brochures and video, tighten the law of enforcement protection and severely punish tourists who damaged the resources and environment, etc.
- **Strengthen community participation in tourism management and community work:** Community should pay special attention to local residents to improve tourism ecological resources and environment. If not consider local residents, tourism management are not likely to be successful.
- **Establish tourism safety emergency mechanism:** In recent years, security accidents have also happened in Xian Tsinling, such as fire, cholera, bird flu, traffic safety accidents. These have influenced the Xian Tsinling tourism and life and property security of residents. Therefore, we should actively construct Xian Tsinling traveling

security warning system to mobilize all active community.

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