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# Analysis and treatment of the conflict between sustainable development and environmental protection based on the ecotourism concept

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With the rapid development of the global economy over the past few decades, tourism has greatly influenced economic internationalization and has become one of the top sectors. Meanwhile, during the development of tourism, serious environmental pollution and excessive energy resource consumption also occur, which is disadvantageous for the health of the global ecological environment as well as sustainable development. Against the background of increasing environmental pollution in the course of tourism development, some researchers began to introduce the ecosystem concept and emphasized the need for the construction of ecosystem models, especially those based on environmental protection, to satisfy the psychological needs of tourists and self-similarity and development of ecological institutions. However, many conflicts exist between sustainable ecosystem development and environmental protection. To realize a healthy and sustainable development of tourism and international ecological culture, this paper discusses the conflict between the concepts of ecosystem, sustainable development, and environmental protection, proposes some methods to improve the comprehensive benefits of ecotourism, and provides some suggestions for the development of ecotourism in China. This will help us achieve the sustainable use of resources and sustainable development of tourism.

## KEYWORDS

ecotourism, sustainable development, environmental protection, conflict analysis, tourism

## 1 Introduction

Ecotourism refers to traveling to relatively undeveloped natural destinations to appreciate the natural environment, gain knowledge about the wildlife, and enjoy the local culture in an authentic setting while preserving the natural environment of the destination (Lee et al., 2019). Ecotourism is widely promoted in many countries, especially in protected areas, contributing to the sustainable development of tourism (Buckley et al., 2008). If well-planned, ecotourism can provide secondary economic benefits to residents

(Deery et al., 2012). However, residents often protest poorly planned ecotourism operations, which have negative impacts on the environment and livelihoods (Kousis, 2000). Therefore, reconciling sustainable ecotourism development and environmental protection has become a hot topic of debate in tourism-developing countries.

A comprehensive model of ecotourism includes sustainable features that support environmental improvement, are on a global scale and involves environmental and sociocultural levels (Weaver, 2005). The ecological economy is an economic benefit that benefits from good ecotourism. The ecotourism model can reduce resource consumption, increase the number of industries, significantly improve tourism efficiency, and enhance the reputation of tourists and tourist attractions. In conclusion, the ecotourism development model has great advantages, and because of this model, and tourism has become an increasingly popular research topic worldwide. Ecosystem policies, as an important link to promote the sustainable development of tourism, have been widely recognized by domestic and international tourism organizations and ecological conservation organizations. According to the incomplete statistics of world travel agencies and the current market environment, ecotourism services account for 31% of the overall tourism market (Tao, 2018), as shown in Figure 1.

In recent decades, the rapid growth of ecotourism has led to an increasing focus on ecotourism research. A review by Gossling et al. (2012) highlighted the uncertainties and research needs regarding the behavior of ecotourists toward climate change. Deery (2012) summarized the social impacts of ecotourism. Chinese scholars have focused on ecotourism community participation, ecological poverty alleviation, and sustainable development in addition to ecotourism concepts, resources, and systems research. The attempt to review the literature on ecotourism is narrow and fragmented, presenting a lack of

comprehensive understanding of the topic. Because ecotourism can rank differently within local economies, it is particularly important to study its sustainable development.

Because the current ecotourism development model in China is still in its infancy, the rapid development of tourism, especially by tourism operators in pursuit of rapid success and economic benefits, has led to an ecosystem imbalance and environmental deterioration in tourist areas, and which is contrary to the initial intention of preserving ecosystems. The ecological environment is the foundation of human survival and maturity, and the promoter of the ecosystem (Zhang, 2020). Therefore, we must realize that environmental protection is a necessary condition for the sustainable development of ecotourism and a fundamental guarantee for the promotion of healthy ecosystems in China. In this context, this study analyzes the conflict between sustainable development and environmental protection based on the concept of ecotourism and its treatment. We discuss the example of Changbai Mountain, aiming to achieve consistency between the sustainable development of ecosystems and environmental protection.

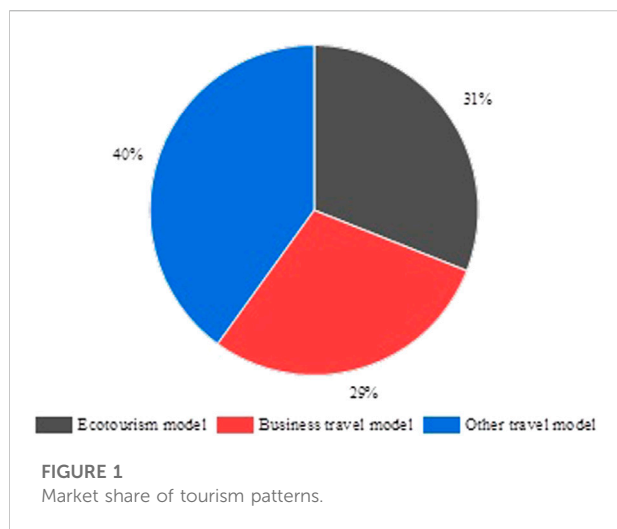
## 2 Connotation and extension of ecotourism

### 2.1 Connotation of ecotourism

As early as 1965, Hozette defended the so-called environmental travel, which was later used by Canadian scientist Claude Moline in articles on ecological planning and cultural tourism involving residents and communities. The concept of ecotourism emerged in the 1980s to address the negative impacts of traditional tourism. As a result, ecotourism is generally considered sustainable, ecologically sustainable, environmentally appropriate, and environmentally responsible (Sharpley et al., 2006; Farrell et al., 2020). The International Ecotourism Society, founded in 1990, first proposed an authoritative definition of ecotourism after years of exploration as “responsible tourism to natural areas that protects the environment, maintains the well-being of local people, and involves interpretation and education.” The Chinese scientist Lu Yunting, in 1996, commented on ecosystem ecology and the peripheral activities of tourism that can not only bring social and economic benefits but also contribute to environmental protection, guided by ecological principles and indicators.

### 2.2 Characteristics of ecotourism

Tourism has a relatively strong scientific and cultural connection that requires the design, route, facilities, and services to reflect a strong professional level (Ma, 2017). First,



ecotourism is based on traditional methods. While appreciating the natural landscape, ecologists believe that it is of great importance to understand the culture and natural history of the tourist destination, and consciously protect the ecosystem resources and ecological environment. While traditional tourism takes visitors to natural sceneries and famous monuments for the main purpose of sightseeing, ecotourism is of great importance to appreciate the natural landscape while understanding the culture and natural history of the destination, consciously protecting the resources and ecological environment while offering strong originality (Li, 2016). Generally, ecotourism promotes places with a large amount of natural ecological landscapes and national and regional customs. Furthermore, combined with the costs of the resources, the value generated from the ecosystem advocates the sustainable development of the economy, pursues social and environmental benefits, and thus achieves long-term optimal overall profit development (Zhang et al., 2015).

## 2.3 The concept of ecotourism

There is no unified concept of ecotourism among scholars in various countries. Scholars have analyzed and defined ecotourism from different points of view. In 1980, H. E. Ceballos-Lascurain, the WTO Special Adviser on Ecosystems, first proposed the concept of ecosystem (Zhang and Chen, 2015) as “It is for the purpose of studying, tasting and evaluating the cultural and natural characteristics of different regions. And it is relatively unaffected by industrial pollution and will hardly suffer the destruction of tourism activities in natural areas.” In 1993, the International Ecotourism Society defined ecotourism as a tourism activity with the dual responsibility of protecting the natural environment and preserving the livelihoods of local people. Ecotourism is not only about enjoying beautiful scenery but also emphasizes behavior and way of thinking, i.e., conservation tourism. Compared with other types of tourism, ecotourism promotes better natural geographical environments, higher quality, and stronger development ability. At the same time, ecotourism has unique qualities such as sustainability and professionalism, which is consistent with the idea that tourism “applies to nature” and “returns to nature.” This concept, being very popular among tourists, has recently become an important tourism policy and development both at home and abroad (Zou et al., 2019). The emergence of environment-related tourism is an inevitable result of the human understanding of nature and the modification of behavior, reflecting the concept of sustainable development. Ecosystems are also a comprehensive embodiment of economic development, social progress, and environmental value and are social and economic activities that greatly protect the environment and

cultivate awareness of a good ecological environment. Ecosystems are a combination of the ecological environment and tourism to understand the natural landscape, increase ecological knowledge, maintain ecological balance, and provide ecological education (Geng and Luan, 2022). As a new type of tourism, ecotourism is an advanced activity to understand nature, play with nature, and protect nature. It takes environmental protection, ecological education, as well as knowledge sharing as the basic input. Simultaneously, ecotourism provides appropriate facilities to allow visitors to understand, evaluate, and enjoy natural and cultural attractions without damaging the biota or regional cultures (Zhao and Wang, 2018).

## 3 Relationship and conflicts between environmental protection and sustainable development of ecotourism in the Changbai Mountain nature reserve

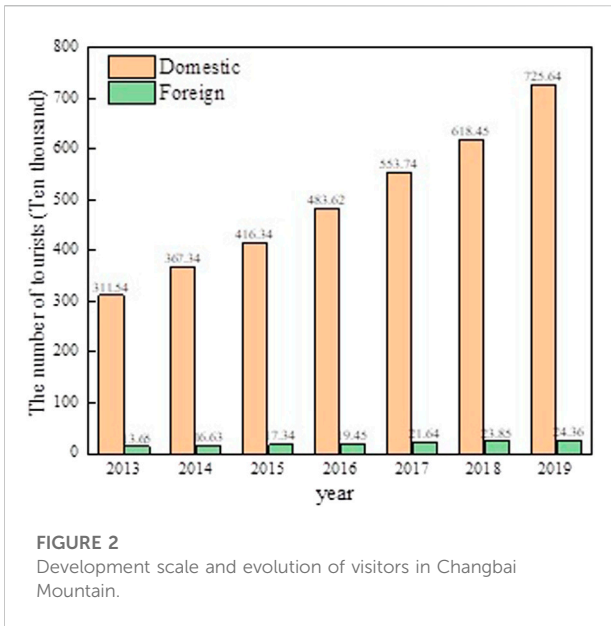
### 3.1 Ecological status of the changbaishan ecotourism area

The Changbaishan Nature Reserve has a relatively complete ecosystem and is one of the richest regions in the northern hemisphere in terms of the biological resources of the same latitude belt. Its four unique vertical distribution zones differ in altitude by nearly 2,000 m, concentrating thousands of kilometers of biological landscape from temperate to polar regions. The geomorphology is complex, and the ecosystem has remained intact; especially, the distinctive yet vulnerable alpine tundra zone surviving within a harsh environment. The Nature Reserve plays an important role in protecting biodiversity, maintaining ecological balance, conducting scientific research, and providing a tourism landscape.

The unique biological and landscape resources of Changbai Mountain offer a gene pool of species, natural laboratory, and museum for scientific research and teaching. Its major natural landscape has become a famous tourist destination for local and international tourists. Therefore, Changbaishan is an important window for scientific and cultural exchanges with the outside world.

At the same time, the dense Changbai Mountain forests, which are the origin of the second Songhua River, Tumen River, and Yalu River, play an important role in nourishing water, ensuring soil and water conservation, regulating the climate, improving the environment, maintaining ecological balance, and providing an important green barrier for Jilin Province.

In summary, the ecological status of the Changbaishan Nature Reserve is very important and it plays an important role in the economic development of Jilin Province and the country.



### 3.2 Development of ecotourism in the Changbai Mountain nature reserve

#### 3.2.1 Scale and evolution of tourist development

Hereinafter, the scope, structure, total tourism income, ecotourism model, and present situation of Changbai Mountain tourism between 2013 and 2019 are analyzed using comprehensive data.

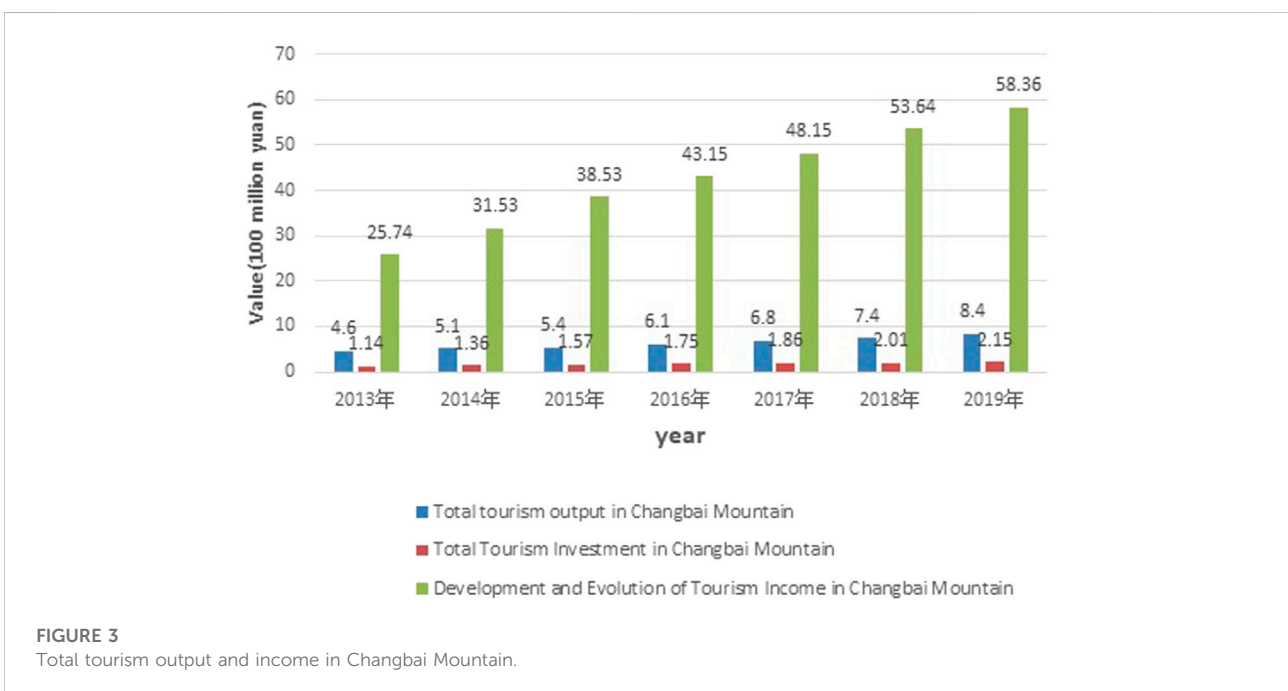
According to the official data of the Changbai Mountain Nature Reserve, the number of tourists has increased linearly since 2010. The number of domestic and foreign tourists increased from 3.154 billion to 7.256 billion and 136,500 to 243,600 in 2013 and 2019, respectively (Figure 2).

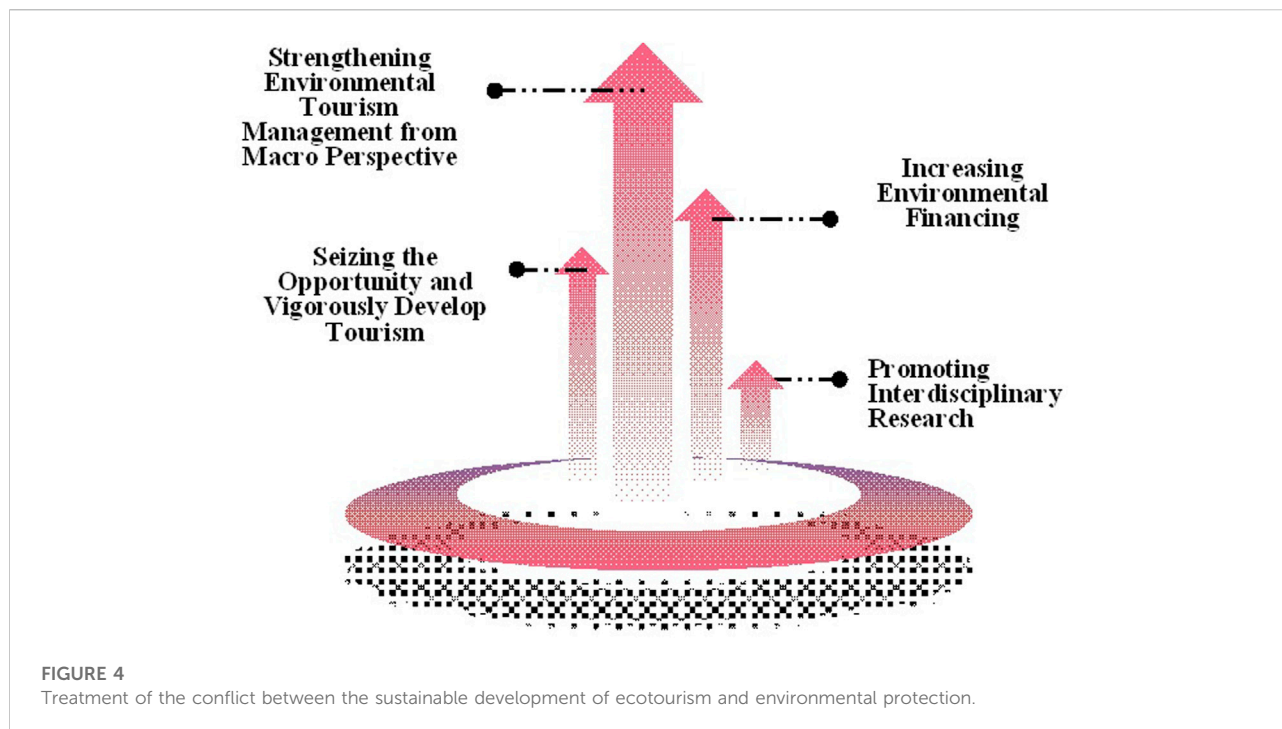
#### 3.2.2 Evolution of tourism income

As the number of tourists has linearly increased, the tourism income of Changbai Mountain has considerably risen in recent years. According to official data of the Changbai Mountain Nature Reserve, domestic tourism income increased from 2,574 billion yuan in 2013–5,863 billion yuan in 2019. According to the statistical science law of relevant experts and scholars, if not affected by the era of new nepotism, Changbai Mountain’s tourism income is expected to exceed six billion yuan by 2020. The tourism income in Changbai Mountain is shown in Figure 3.

#### 3.2.3 Evolution of ecotourism

With the significant increase in the number of tourists and tourism income on Changbai Mountain, the annual investment and efficiency of ecotourism have greatly improved. Investment increased from 114.24 million yuan in 2013 to 215.34 million yuan in 2019. The output increased from 460 million yuan in 2013 to 840 million yuan in 2019. The total resource value development of the Changbai Mountain Nature Reserve is shown in Figure 4, and the development of the total investment in the Changbai Mountain Nature Reserve is shown in Figure 3.





### 3.3 Environmental protection of ecotourism in the Changbai Mountain nature reserve

At present, the pollution prevention and control work of the food and entertainment industry in the Changbai Mountain Nature Reserve, including the conversion of coal into natural gas and promotion of biomass fuel, has not been solved. Central heating area boilers, stoves, and small bathtubs as well as integrated heat in the environment require pollution permits. Although small-scale boilers in Chibei were eliminated in 2012, old small-scale boilers are still being used in villages around Chixi and Changbai Nadal, which have poor burning conditions. Environmental regulators have not yet been established owing to insufficient funding. Although the ecological environment of Changbai Mountain provides tourists with various experiences, the rapid development of the tourism sector has violated some environmental protection regulations. The development of tourism on Changbai Mountain leads to fragile ecosystems and inevitably results in environmental problems.

### 3.4 Relationship and conflict between sustainable development and environmental protection of ecotourism in the Changbai Mountain nature reserve

There is a particularly complex link between sustainable ecosystem development and environmental protection, as

ecosystems have both positive and negative impacts on environmental protection. Positive impacts are manifested in the ability to improve the quality of the ecological environment and alleviate conflicts with the residents. Although ecotourism is currently recognized as the most environmentally friendly form of tourism, its negative impacts are also obvious such as the inevitable impact on local culture. To achieve sustainable development, it is necessary to understand the expansion and linkages between these relationships and provide a solid basis for follow-up research and resolution of conflicts between sustainable ecosystem development and environmental protection.

#### 3.4.1 Relationship between the quality of environmental protection and the value of ecosystem policies

Nature is a magical place with beautiful mountains and rivers, as well as beautiful scenery, all of which are part of the environment. By sailing in the beauty of nature, people meet their spiritual needs (Fu and Sun, 2010). Disrupting ecotourism will inevitably affect the tourists that cannot meet their spiritual needs, thus losing the value of ecotourism. This indicates that the quality of the environment directly determines the value of ecotourism. Therefore, compared to the value of the ecosystem, the quality of environmental protection is more important. People travel and create value for tourism only when the environment is pristine.

### 3.4.2 Positive impacts of ecosystem values on environmental protection

The value of ecosystems has many positive impacts on environmental protection. First, it provides funding for environmental projects. At present, the environmental protection funds for tourism mainly come from financial expenditure, but because of the limited funds of the municipal government, financial allocation is often insufficient. Therefore, environmental protection in eco-friendly tourist areas lack economic support, hence these areas cannot make full use of their value. However, increasing ecosystem travel can effectively solve the lack of funds for ecotourism and provide a solid foundation for improving the environmental quality of ecotourism areas (Zhou, 2018).

In addition, the richness of the natural environment and ethnicity of the region attracts tourists to an area, which allows the preservation of local customs, art forms, and handicrafts that may be in danger of gradual extinction. Visitors to the Changbaishan region spend money on food, lodging, entertainment, transportation, and shopping. This spending helps create employment opportunities for local communities in hotels, transportation, and travel agencies, thereby increasing tourism revenue. This, in turn, increases the economic income of the Changbaishan ecological reserve.

Second, it improves the quality of environmental protection. Whether tourism can sustainably develop and continuously benefit the economy, depends on the state of the environment and the adequacy of the tourist zones. Therefore, developers will improve the ecological environment of tourist areas by investing money, labor, and materials. The development of tourist areas will increase their influence and attractiveness (Zhao, 2018). Second, developers will build waste treatment plants and increase green areas in the area to create a better external environment for ecotourism.

Finally, ecotourism leads to community development and improves the standard of living for local people. The development of ecotourism reserves has mainly improved the income and employment of local people by improving the local environment.

To improve ecotourism and take full advantage of the resources and characteristics of the Changbaishan Reserve, ecotourism routes and key sightseeing spots need to be arranged, while service centers and ecological environment monitoring stations require development. Further, ecological tourism management and tour guide training should improve to ensure that ecological and cultural aspects can be sustained while providing tourists with high-quality services.

### 3.4.2 Conflict between sustainable development of ecotourism and environmental protection

The development of tourism depends on the environment (Zhang and Zhao, 2018). However, because of the vulnerability of the environment, the development of tourism is bound to cause

damage and environmental pollution. The management and systematic protection of the environment will inevitably affect the sustainable development of ecosystem policies. This contradiction between environmental protection and tourism development is manifested in the following aspects.

First, the sustainable development of tourism damages the environment. From a macroeconomic perspective, damage to the environment caused by sustainable tourism development is mainly manifested in the destruction and pollution of natural and cultural landscapes, such as mountains, lakes, forest resources, and wildlife. From a micro perspective, damaging the environment also affects tourists (Qiu and Kang, 2017). Tourists in the Changbaishan ecological tourism area may irresponsibly dispose garbage, pick flowers and plants, and cause environmental pollution. If environmental management and maintenance is not in place, the degree of pollution may be aggravated. Second, poor maintenance of the environment, such as water and air pollution, and ecological damage, can considerably affect the tourist attraction resources, which not only reduces the number of visitors to the attractions but also affects the economic and social benefits, resulting in considerable wasted resources. Third, the Changbaishan ecological tourist area can increase the number of commercial stalls and stores to cater to the tourists, generating a large amount of domestic wastewater, sewage, and garbage. For the long-term development of tourist attractions, these businesses are a significant source of ecological pollution, which is not conducive to the sustainable development of tourism.

Tourist attractions often attract many visitors, which leads to infrastructure and traffic congestion. During the peak season, tourist resorts are highly busy, which affects the wildlife and local environment. This damage has a significant impact on tourism in developing countries. The damage caused by tourism can be attributed to the following three points. First, tourism mainly focuses on the economic benefits, leading to excessive plundering of regional resources. Second, the excessive compression of tourists during the peak season lacks scientific and reasonable management methods such as nursing or price adjustment (Qiao, 2022). Third, while tourism is developing, the pathological development of places of interest and tourist facilities is becoming increasingly evident. As a result, reasonably and sustainably developing tourism resources has become an urgent problem for the tourism industry.

Second, the sustainable development of tourism has aggravated the malpractice of improper environmental protection. Since 1973, China has issued a series of laws and regulations on environmental protection and governance, to establish an environmental management system (Xu et al., 2018). Although environmental protection work, tourism managers, industry executives, and environmental regulators have cooperated in the field of prevention and monitoring, and have achieved some success, there are still many shortcomings.

On one hand, the system of environmental protection and management is imperfect (Zhang, 2018). Although China has promulgated a series of environmental protection laws and regulations, the tourism industry has not formulated specific environmental protection laws in the ecosystem field. It was not until 1985 that the Chinese government listed tourism as a key enterprise supported by the state. Therefore, despite environmental protection, ecological evolution remains at an early stage of development. Owing to the lack of proper supervision and enforcement of laws and regulations, most infrastructure projects in tourist areas do not comply with appropriate environmental practices. In addition, as there is no authoritative environmental protection agency, several separate tourism and environment departments have taken responsibility with various policy directions, which is not conducive to the development of environmental protection work.

However, there is a lack of environmental awareness in the tourism sector. The long-term, healthy development of the Changbaishan ecological tourism area needs to overcome the short-term behavior in the environmental carrying capacity. To establish a sense of concern about tourism resources, we must acknowledge the anthropogenic atmospheric pollution, reduction in forest vegetation area, and other serious environmental problems. Some scenic tourist areas are located in remote and underdeveloped areas of China, such as the southwest. They are partially closed or open, relying on their traditional agricultural practices; thus, when the area develops into a tourist destination, residents gain economic income by destroying the ecology or hunting animals for souvenir trading. Moreover, the low ecological consciousness of residents affects that of tourists. Uncivilized behaviors, such as littering, peeling, and writing on cultural relics, are common in these areas.

With the increasing promotion of tourism in Changbaishan, some potential ecological and environmental pressures have also increased, and the development of tourism has had a negative impact on the ecological environment and landscape, mainly due to adverse effects on the vegetation, water bodies, atmosphere, wildlife, and landscape. The development of tourism resources and construction of supporting service facilities has also had an impact on the environment. For example, the construction of a highway around Changbai Mountain and tourism facilities within the mountain gate have had a negative impact on the ecological environment, resulting in local soil erosion and vegetation destruction. The exhaust emissions and noise pollution from tourist vehicles have only polluted the atmosphere but also affected the habitat of wild animals in the area.

## 4 Conflict between sustainable development of ecotourism and environmental protection

Environmental protection is a systematic project and is the premise and responsibility of sustainable tourism development.

Therefore, scientific and comprehensive management practices are essential to protect and restore the good conditions of the tourism environment in China and to prevent further deterioration (Figure 4).

### 4.1 Strengthening environmental tourism management from a macro perspective

The work related to the environmental protection of tourism should concentrate more on “prevention” rather than on “management,” and emphasize the management idea that “prevention is better than management, prevention precedes management.” Activities related to tourism environmental protection should be carried out through planning and development, focusing on the development and consolidation of tourism in different stages. While planning, effective measures should be taken in environmentally protected areas and places of interest to control the possible extent of congestion using scientific and reasonable environmental forecasts and estimates for macroeconomic management. On the other hand, there is no need to employ short-term management methods to address behaviors that have no environmental impact.

The development of tourism in the Nature Reserve must be carried out under the premise of good ecological protection. For this reason, the protection and construction of tourist resources is a key concern while developing tourism. Based on the unique geological and geomorphological conditions, rich and unique flora and fauna, and varied landscape resources of Changbaishan, the area can be considered for the United Nations World Natural Heritage title while being developed protectively to obtain more effective supervision and develop a wider source of funding for environmental protection. Careful development of tourism resources in the Changbaishan Nature Reserve, comprehensive protection, construction of the ecological environment of the region, and early inclusion in the World Natural Heritage List should be the long-term development and ecological construction goals.

### 4.2 Increasing environmental financing

Environmental protection is a national priority. First, given the financial difficulties, relevant departments at all levels should adopt a multi-channel and multi-funded approach to ensure that sufficient resources are available for environmental tourism in China. Moreover, local governments should actively develop tourism and related industries, continue to promote economic affordability, and increase investment annually to protect the tourism environment.

Second, it is possible to establish a special supervisory institution for ecological compensation to ensure that both

sides of the construction follow the ecological compensation agreement. In response to this *status quo*, it is necessary to establish an interdepartmental institution to implement the management of the ecological compensation fund for Changbaishan National Nature Reserve.

The regional environmental characteristics and ecological status of Changbaishan National Nature Reserve determine the regular monitoring of the ecological environment in the area, including elements such as water, gas, and noise, in addition to plant and animal diversity and their population dynamics, changes in habitats, and ecological disasters, such as soil erosion, landslides, and mudslides.

#### 4.3 Seizing the opportunity and vigorously developing tourism

In recent decades, with the enhanced awareness of the environment, tourists have played an important role in environmental protection. In general, rural tourism, green tourism, and other environmentally friendly forms of tourism have solved the contradiction between tourism and environmental protection to some extent, which has become a new trend in the development of global tourism. China has abundant ecotourism resources and possesses many internationally-recognized nature reserves; therefore, it is time to raise environmental protection awareness at home and abroad. In short, tourism development should not run without environmental protection, as effective environmental protection enables tourism to develop better and more sustainable. Against the background of increasing awareness of the need for environmental protection through the comprehensive management of the tourism environment by macroeconomic and relevant departments, tourism resources can be continuously utilized, thus becoming a new sustainable industry in modern society.

The development of tourism in Changbaishan has a history of more than 20 years, and the number of visitors has reached a peak of over 10,000 people/year; however, the development of tourism in Changbaishan still lacks effective planning, which is an urgent task for the Administration of the Nature Reserve and tourism management departments. This is because the current tourism resources and environment of Changbaishan Mountain have undergone different degrees of impact and damage to a large extent, related to the lack of scientific tourism planning. During the 14th Five-Year Plan period, the Changbaishan Nature Reserve Administration should hire qualified units to develop comprehensive tourism plans for the area. Tourism planning should start with the overall ecological characteristics and resource conditions of the Changbaishan Nature Reserve, break administrative division boundaries, rationalize the layout of tourism projects, and propose the necessary conditions for development. The Changbaishan tourism area

should continue the development of science-based sightseeing tourism, including adventure, recreation, ice and snow, and leisure tourism.

#### 4.4 Promoting interdisciplinary research

Tourism science is a popular interdisciplinary and comprehensive discipline. Environmental protection in tourism encompasses a wide range of topics. Therefore, the development of tourism destinations with natural scenery requires interdisciplinary and in-depth scientific research to become sustainable.

### 5 Conclusion

Ecotourism is an advanced and scientific tourism model that can ensure the sustainable use and development of the ecological environment and improve the well-being of the residents, but it is not a panacea for all problems in tourism development. In China, the development of ecotourism started relatively late and many shortcomings remain, such as the large conflict between the sustainable development of ecotourism and environmental protection, especially in terms of planning delay, insufficient investment, lack of quality products, and environmental degradation. Sustainable ecotourism requires the use of comprehensive benefits, including strengthened management of environmental protection from the macro perspective and increased construction of environmental protection funds, in addition to the need to seize the opportunity to vigorously develop ecotourism. Further, we need to strengthen subject-based research, awareness of the need for environmental protection, and realize the common management between subjects and objects. Finally, it is necessary to provide strong legal and management systems for tourism environmental protection to realize the sustainable utilization of resources and development of tourism.

#### Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

#### Author contributions

JT: Conceptualization, methodology, investigation, formal analysis, and writing—original draft. JL: Data curation, writing—original draft, supervision, project administration, investigation, and resources.



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## References

- Buckley, R., Cater, C., Linsheng, Z., and Chen, T. (2008). Shengtai luyou: Cross-cultural comparison in ecotourism. *Ann. Tour. Res.* 35, 945–968. doi:10.1016/j.annals.2008.07.002
- Deery, M., Jago, L., and Fredline, L. (2012). Rethinking social impacts of tourism research: A new research agenda. *Tour. Manag.* 33, 64–73. doi:10.1016/j.tourman.2011.01.026
- Farrell, B. H., and Runyan, D. (1991). Ecology and tourism. *Ann. Tour. Res.* 18, 26–40. doi:10.1016/0160-7383(91)90037-c
- Fu, Z., and Sun, L. (2010). Study on development of travel industry and eco-environmental protection in Changbai mountain national nature reserve Chinese. *J. Environ. Manag.* 3, 25–27.
- Geng, R., and Luan, Z. (2022). A statistical measurement of the coupling and coordinative development of China's provincial tourism industry and the ecological environment. *J. Central South Univ. For. Technol.* 8, 191–201.
- Gossling, S., Scott, D., Hall, C. M., Ceron, J., and Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. *Ann. Tour. Res.* 39, 36–58. doi:10.1016/j.annals.2011.11.002
- Kousis, M. (2000). Tourism and the environment: A social movements perspective. *Ann. Tour. Res.* 27, 468–489. doi:10.1016/S0160-7383(99)00083-3
- Lee, T. H., and Jan, F. H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tour. Manag.* 70, 368–380. doi:10.1016/j.tourman.2018.09.003
- Li, Q. (2016). Analysis of rural tourism development model, problems and countermeasures based on natural landscape background. *China Agric. Resour. Regional Plan.* 37, 176–181.
- Ma, R. (2017). An analysis of the sustainable development of shunde fengjian water town tourism based on SWOT analysis. *Tour. Overview.* 2, 159–160.
- Qiao, M. (2022). Study on eco-tourism and eco-environmental protection in nature reserves. *Value Eng.* 11, 85–86.
- Qiu, S., and Kang, P. (2017). Concept of natural symbiosis—design thinking based on sustainable ecological development. *Ind. Des.* 1, 71–73.
- Sharpley, R., and Duffy, R. (2006). Ecotourism: A consumption perspective. *J. Ecotourism* 5, 7–22. doi:10.1080/14724040608668444
- Tao, F. (2018). Exploring ecotourism marketing strategies and standing issues. *Tour. Today* 18, 69–70.
- Weaver, D. B. (2005). Comprehensive and minimalist dimensions of ecotourism. *Ann. Tour. Res.* 32, 439–455. doi:10.1016/j.annals.2004.08.003
- Xu, G., Wang, Y., and Xin, P. (2018). Discussion of the ecological compensation mechanism for Changbai mountain national nature reserve. *Environ. Prot. Sci.* 2, 18–22.
- Zhang, B., Li, D., Liu, S., and Liu, Y. (2015). Practice and discussion of high-quality resource sharing courses in higher vocational education—Taking the course of “Environmental Protection and Sustainable Development” as an example. *J. of Hebei Agric. University (Agriculture and Forestry Education Edition)*, 17, 76–79.
- Zhang, J., and Chen, C. (2015). Research on the sustainable development of water tourism in Changzhou based on the analysis of municipal tourism industry. *Jiangsu Water Resour.* 223, 52–53.
- Zhang, T., and Zhao, X. (2018). Rural tourism development and optimization strategies from the perspective of global tourism—taking jinling village, dawu county, hubei Province as an example. *J. Hunan Univ. Technol.* 32, 76–83.
- Zhang, Y. (2020). Talking about the sustainable development of green building. *Shaanxi Water Resour.* 11, 174–175.
- Zhang, Y. (2018). The effect and limitation of environmental NGO participation in neighbour avoidance conflict—based on the investigation of ten typical cases in China. *China Adm.* 391, 41–47.
- Zhao, D. (2018). Qualitative analysis of pension information in online communication communities—Exploratory research based on topic framework method. *J. Inf. Syst.* 1, 50–61.
- Zhao, S., and Wang, H. (2018). Research on the path of sustainable development based on rural governance—an empirical study of yuanjia village in shaanxi Province. *Jiangsu Urban Plan.* 1, 22–25.
- Zhou, Y. (2018). Analysis the answers to the real questions of the college entrance examination and explore the way of thinking of answering questions—taking the college entrance examination questions for sustainable development of agricultural products as an example. *Teach. Exam.* 45, 33–34.
- Zou, Q., Lou, G., Yang, L., and Fu, J. (2019). Research on the sustainable development path of Shilin Taiwan Farmer Entrepreneurship Park from the perspective of environmental protection. *Environ. and Sustain. Dev.*, 44, 72–77.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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