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Utilization and Protection of the World Heritage - Mixed Property in Huangshan Mount

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Abstract. The Huangshan World Geological Park in Huangshan City, Anhui Province, China is a double heritage of world culture and nature. The main feature is the granite peak forest landform. There are natural resources such as peculiar pine, rocks of grotesque shapes, etc. There are also cultural resources such as balconies, pavilions, bridges and other ancient buildings as well as ancient poems. This paper introduces the natural and cultural overview of Mount Huang from the perspective of utilization and protection of heritage. Using data from the Unesco website, a comparative approach is used to compare the mountain-type mixed heritage. Draw tables and find out the utilization value of Huangshan. Points out the problems of water quality pollution, biological protection and tourism environment in the development of Huangshan Mountains, and puts forward some feasible suggestions.

Keywords: Mount Huangshan, World Heritage - Mixed Property, Sustainable Development

1. Introduction

The Huangshan World Geological Park is located in the territory of Huangshan City, Anhui Province, China. Its geographic coordinates are 118 degrees 01'to 118 degrees 17' longitude east, 30 degrees 01'to 30 degrees 18' latitude north, and its elevation is 440m to 1864.8m [1]. The park is characterized by the granite peak forest landform, which is rich in both biological resources and human landscape. Huangshan World Geological Park is a World Heritage - Mixed Property. World Heritage - Mixed Property refers to the heritage of culture and nature. There were 39 items as of January 2020. Huangshan has not only natural wonders represented by strange pines, strange stones, clouds and hot springs, but also cultural resources such as balconies, pavilions, bridges and ancient buildings as well as ancient poems. Previous studies only analyzed the natural environment of the Yellow Mountains and introduced the tourism resources of the Yellow Mountains [2]. They did not reflect the advantages of Huangshan as a natural and cultural heritage, nor did they specifically point out the problems and solutions in the development process. From the point of view of utilization and protection of heritage, this paper analyses the development status and value of Huangshan, points out the problems in the process of protection, and puts forward suggestions for development.

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2. Overview

2.1. Overview of natural resources

Huangshan is located in the territory of Huangshan City, Anhui Province. It is located in the southern part of Anhui Province and the northern part of Huangshan City. It spans Shexian, Xiuning, Yixian, Huangshan and Huizhou districts, starting from Huangshiling in the east, going west to Xiaoling Foot in the north, Erlong Bridge in the north, and Tangkou Town in the South and about 40 kilometers in the East and west. It is roughly bounded by the administrative boundaries of Tangkou Town, Tanjiaqiao Town, Sankou Town, Jiaocun Town and Yanghu Forest Farm in the Huangshan Mountains. The total area is about 1200 square kilometers. Today, it has as much appeal to visitors, poets, painters and photographers as it did in ancient times. Known for its magnificent scenery, the heritage consists of numerous granite peaks and rocks exposed from the cloudy sea. The following table provides a statistical overview of the geographical environment and natural resources of the Yellow Mountains.

Table 1. Statistical overview of the geographical environment and natural resources of the Huangshan.

	Topographic features	Geological characteristics	Hydrological characteristics	Climatic characteristics	Natural resources
Mount Huangshan	Mount Huang has 72 peaks. The main peak, Lianhua Peak, is up to 1864.8 meters above sea level. It is also called the three main peaks of Mount Huang with the light peak and Tiandu Peak.	The Huangshan Mountains are mainly composed of Yanshanian granites, with well-developed vertical joints, strong erosion cutting, interlaced faults and cracks, and long-term water erosion, forming granite caves and channels.	There are more than 600 rivers in Huangshan, of which 108 are longer than 10 kilometers. Water resources in the Yellow Mountains come from natural precipitation. The average annual surface rainfall in this area is 1775.9mm.	Huangshan is a subtropical monsoon climate, with deep mountains and valleys, and the climate changes vertically. Local topography plays a leading role in the climate. Cloudy, humidity and precipitation are heavy, forming a special monsoon climate in mountainous areas.	The ecosystem of Huangshan is stable and balanced. There are 1805 species of 827 genera of 222 families of higher plants and 37 species of national protected plants. There are 24 species of fish, 21 species of amphibia, 48 species of reptiles, 176 species of birds and 54 species of animals, belonging to 32 species of state-level protected animals.

Note: Data are from the UNESCO website.

The Yellow Mountains are located in the subtropical monsoon climate zone. Because of the deep valleys, the climate changes vertically. At the same time, due to the large difference of sunlight radiation between the north and South slopes, local topography plays a dominant role in its climate, forming the climatic features of cloudy, humid and precipitation. It has two lakes, three waterfalls, sixteen springs and twenty-four streams. The four seasons have different scenes. Huangshan also has the nickname of "natural zoo and underground botanical gardens". There are 285 species of 827 genera of 222 families of higher plants and more than 500 species of animals. The pleasant climate of Mount Huang is a summer resort, a national scenic spot and a summer resort for recuperation.

2.2. Overview of Culture

There are more than 100 ancient buildings in Huangshan, such as balconies, pavilions, bridges and so on. Most of them are of the style of emblems. Among them, Hearing Tao resides in front of the herringbone waterfall and on the top of lava rock, once a place of confinement for General Zhang Xueliang. There are nearly 300 cliff stone carvings in the past dynasties in Huangshan. Seals, official scripts, lines, regular scripts and grass are all available, and there are all schools of Yan, Liu, Europe and Zhao. Huangshan has bred the "Huangshan Painting School", and created the landscape painting school whose main object is Huangshan. It has far-reaching influence in Chinese painting circle, and

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gives landscape to paintings, forming a wonderful realm of fusion between man and landscape [3]. The image of Huangshan has undergone the evolution from natural image to literary image. From the discovery of landscape, to the endowment of spiritual connotation, to the choice of expression methods, this laid a foundation for the image of Huangshan [4].

2.3. Comparison of the Mixed Heritage Sites of the Yellow Mountains and the World Similar to the Yellow Mountains

Table 2. Comparing the Mixed Heritage Sites of Mount Huang with those of the world.

Name	Date of Inscription	Criteria	Geographical Coordinates	Property
Mount Huangshan	1990	(ii) (vii) (x)	N30°8'43.199", E118°9'18.299"	16060 ha
Khangchendzonga National Park	2016	(iii)(vi)(vii)(x)	N27°45'53", E88°22'38"	178,400 ha
Wadi Rum Protected Area	2011	(iii)(v)(vii)	N29°38'23", E35°26'2"	74,179.7 ha
Göreme National Park and the Rock Sites of Cappadocia	1985	(i)(iii)(v)(vii)	N38°40'0.012", E34°51'0"	9,883.81 ha
Mount Athos	1988	(i)(ii)(iv)(v)(vi)(vii)	N40°16'0.012", E24°13'0.012"	33,042.3 ha
Historic Sanctuary of Machu Picchu	1983	(i)(iii)(vii)(ix)	S13°11'5.762", W72°32'0.395"	38,160.87 ha
Kakadu National Park	1981	(i)(vi)(vii)(ix)(x)	S12°49'60", E132°49'60"	1,980,994.92 ha
Tongariro National Park	1990	(vi)(vii)(viii)	S39°17'27", E175°33'44"	79,596 ha
Ngorongoro Conservation Area	1979	(iv)(vii)(viii)(ix)(x)	S3°11'13.992", E35°32'26.988"	809,440 ha

Note: Data are from the UNESCO website.

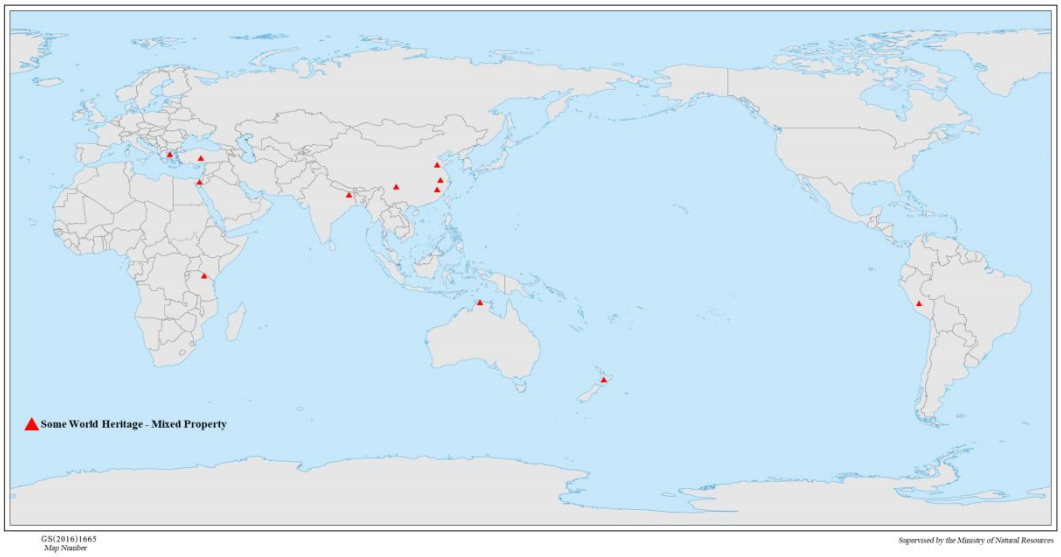

Figure 1. Distribution of mixed heritage with similar attributes in Mount Huangshan.

The common points of these heritage sites are the combination of mountains and local culture, but the standards for the application of mixed heritage in the five major regions have their own emphasis. It objectively reflects the differences and characteristics of natural and cultural resources in different

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areas. Among them, the standard (vii) is the most, that is, wonderful natural phenomena or areas with rare natural beauty and aesthetic value. It proves that the development of culture and natural beauty influence each other.

2.4. Comparison of the Mixed Heritage Sites in Huangshan and China

Table 3 A comparison of the mixed heritage of Mount Huang and China.

Name	Date of Inscription	Criteria	Geographical Coordinates	Features
Mount Huangshan	1990	(ii) (vii) (x)	N30˚8'43.199", E118˚9'18.299"	With an area of 16060 hectares and a buffer area of 49000 hectares, the Yellow Mountain is also of great importance for its plant richness and for the protection of many endemic plant species, either locally or nationally. The site consists of many granite peaks and rocks.
Mount Taishan	1987	(i)(ii)(iii)(iv)(v) (vi)(vii)	N36˚16'0.012", E117˚5'60"	Mount Tai covers 25,000 hectares and has been an important cradle of East Asian culture since ancient times. Mount Tai was an important object of mountain worship. All architectural elements, paintings, stone carvings, ancient trees and so on were integrated into the landscape of Mount Tai.
Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area	1996	(iv)(vi)(x)	N29˚32'41.64", E103˚46'9.3"	Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area occupy 15400 hectares, with a buffer zone of 46900 hectares. Mount Emei is an area of special cultural significance because it is the first time that Buddhism was established in Chinese territory and spread widely to the east. The Leshan Giant Buddha is the largest Buddhist sculpture in the world.
Mount Wuyi	1999	(iii)(vi)(vii)(x)	N27˚43'35", E117˚43'31"	The Wuyi Mountains cover 107044 hectares and the buffer zone 40170 hectares. Mount Wuyi has the most representative forest. The development and dissemination of New Confucianism in Mount Wuyi provided an environment, especially in the number of ancient Confucian academies from the 10th to 19th century A.D.

Note: Data are from the UNESCO website.

Comparisons show that although they are World Heritage - Mixed, their characteristics are different. The biggest difference between Mount Huang and other mountains is the steepness and peculiar grandeur of Mount Huang, as well as the difficulty of not having Mount Huang on the other mountains on the expedition, which leads to Mount Huang becoming famous later than other mountains. In the early years of Mount Tai, for reasons of imperial culture, Mount Tai was regarded as a symbol of national unity and power. It was too early to be famous. Taoism and Buddhism activities in Mount Wuyi were flourishing, and Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area, which were revered as sacred places of Buddhism, became famous for their religious reasons. However, before the Ming Dynasty, Huangshan was not so famous. Xu Xiake, a traveler and geographer in the Ming Dynasty, traveled to Mount Huangshan in February 1616 and September 1618 during the Ming Wanli year, and became famous only after he wrote two Journals of Mount Huangshan. There is great contingency. The four geographic locations of China's composite heritage are located in the east, south-central, southwest and Southeast directions. The four heritage items also have their own characteristics in cultural, natural and aesthetic attributes. According to the analysis of the heritage standards it meets, the standards (vi), (vii) and (x) appear three times with the highest

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frequency, reflecting the values of "direct tangible connection with prominent events, tradition", "natural aesthetic value" and "biodiversity". In addition, the standards (i), (ii), and (iii) that reflect the outstanding examples of human creative ability, cultural exchanges, and witnesses of civilization are also widely used [5].

3. Results and discussion

3.1. Water quality issues

As a world geological park, a large number of tourists enter the scenic area every day. Human activities affect the water quality of the mountain scenic area. Through the determination of permanganate index and oxygen demand in the water body to assess the water body contaminated by organic substances, monitoring the water quality of several reservoirs around the Huangshan scenic spot found that the biochemical oxygen demand of Tianhai Reservoir is significantly higher than that of other reservoirs. As the Tianhai Reservoir is close to the places where tourists gather, hotels, public toilets are gathered, and human activities are more, it may have a certain impact on the surface runoff that the rainwater washes into the reservoir, resulting in a slightly higher organic pollutant content in the water body of the reservoir than the other three large reservoirs around the scenic area [6].

3.2. Biological protection issues

The stable and balanced ecosystem in the Yellow Mountains and the large protected area of scenic spots are conducive to the protection of diversity [7]. But a large area means that you are vulnerable to natural disasters. Sudden lightning strikes and mountain floods in the Yellow Mountains are the main natural disasters. The Yellow Mountains are granite structures and lack of groundwater. The incidence of snow cover, ice hanging, gale, lightning and mountain torrent in the Yellow Mountains is high. There is also the threat of pine wood nematode disease to Pinus taiwanensis. Pine trematode nematode disease was transmitted to Anhui Province in 1988 through diseased pine box. It has been reported in 16 counties of 7 cities. The spread of pine wood nematode disease has seriously endangered the resources of Pinus taiwanensis and the ecological safety of scenic areas in Huangshan scenic area [8].

3.3. Passenger Flow Problem

In addition to the natural environment problems, there are also problems caused by the impact of the epidemic that lead to poor tourism environment. The most obvious is reflected in the passenger flow. Natural and cultural tourism resources are the most important influential factors in the evaluation of scenic resources, and are important incentives to attract tourists and stimulate tourism consumption [9]. The following is a trend map of the number of tourists in the Huangshan scenic spot from 2015 to 2021.

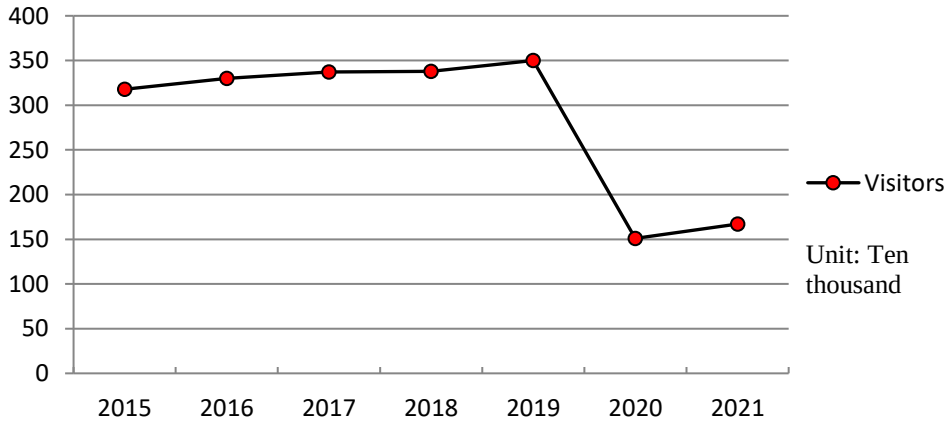

Figure 2. Trend of Tourist Attendance in Huangshan Scenic Area from 2015 to 2021.
Note: Data from Huangshan City Government website.

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From the chart, the number of visitors increased steadily from 2015 to 2019. However, due to the impact of the epidemic, there was a significant decrease between 2020 and 2021 compared with 2019. The city government of Huangshan needs to seize the opportunity to improve the quality of life of tourists. Make full use of the rich tourism resources in the Yellow Mountains region to bring into play the advantages of high-speed railway network. With the interconnection and support of railway transportation, Huangshan strives for the number of tourists to be restored to 2019 within a few years [10].

4. Conclusions and Suggestions

As a world cultural and natural heritage, Huangshan has natural resources such as peculiar pines, strange stones, clouds, hot springs, as well as ancient buildings such as balconies, pavilions, bridges and ancient poems. Mount Huang is of great value to people's aesthetic appreciation and cultural desire. In this paper, some suggestions are put forward. First, there is a large daily passenger flow in Huangshan, close to the places where tourists gather, and the Tianhai Reservoir in hotels, restaurants and public toilets is slightly polluted. The government should pay attention to this problem, improve the drainage structure and avoid sewage discharging into reservoirs. Second, due to the epidemic situation, the number of tourists in Huangshan has declined sharply in 2020. The relevant departments should make full use of the traffic advantages of Huangshan, improve the quality of life of tourists, and strive to restore the number of tourists in 2019 as soon as possible. Third, there are many sudden natural disasters in Huangshan, so safety facilities need to be built to prevent sudden accidents. Forest diseases caused by human factors need to set up multiple forest plant quarantine stations to prevent diseases from entering. Specialists are required to prevent and treat trees that are already sick. This paper focuses on the comparison of the nature and culture of Mount Huang and other heritage, and hopes that future research can find more perspectives to cut into the development of Mount Huang.

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