

THE MODEL AND PATH OF SUSTAINABLE DEVELOPMENT OF MINORITY COMMUNITIES PROMOTED BY WORLD HERITAGE PROTECTION: A CASE STUDY OF YAOSHAN VILLAGE IN LIBO, CHINA

Shizhen Xiao¹, Zhenrui Ma², Yingxi Shi², Rutie Mo²

¹**School of Karst Science, Guizhou Normal University, Guiyang,
Guizhou, China, 349871690@qq.com**

²**The Administration of Libo Karst World Natural Heritage, Libo,
Guizhou, China, mrtfe@163.com**

1. Introduction.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. This is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972. Till now, there are 1223 properties inscribed on the World Heritage List and 59 of them are located in China.

South China Karst is one of the world's most spectacular examples of humid tropical to subtropical karst landscapes. It is a serial site spread over the provinces of Guizhou, Guangxi, Yunnan and Chongqing and covers 97,125 hectares. It contains the most significant types of karst landforms, including tower karst, pinnacle karst and cone karst formations, along with other spectacular characteristics such as natural bridges, gorges and large cave systems. The stone forests of Shilin are considered superlative natural phenomena and a world reference. The cone and tower karsts of Libo, also considered the world reference site for these types of karst, form a distinctive and beautiful landscape. Wulong Karst has been inscribed for its giant dolines (sinkholes), natural bridges and caves. Guilin Karst is considered the best known example of continental fenglin and provides a perfect geomorphic expression of the end stage of karst evolution in South China. Shibing Karst provides a spectacular fengcong landscape, which is also exceptional because it developed in relatively insoluble dolomite rocks. Jinfoshan Karst is a unique karst table mountain surrounded by massive towering cliffs. Huanjiang Karst is an extension of the Libo Karst component.

In the process of World heritage protection and development, the role and influence of the community are constantly receiving attention. Whether it is a World Heritage site that has been inscribed on the World Heritage list, or a World Heritage nominated site in the process of nomination, the role of the community is becoming more and more important. The concern and participation of the community in heritage protection is an important driving force to promote sustainable development. How to share the benefits of World heritage protection and how to promote intercultural dialogue, peace building and sustainable development through heritage protection are the most basic development trends of world heritage in the 21st century.

The karst mountainous areas are identified as the most economically impoverished and most ecologically vulnerable areas in China. It has concentrated nearly 50% of the country's impoverished people, and is one of the areas with the highest concentration of impoverished people in China. Residents rely heavily on environmental resources for their livelihood.

2. Study Area.

The study area includes Libo Karst World Natural Heritage Site and the Yao village of Lapien Village, Yaoshan Nationality Township, located in the buffer zone of the Libo Karst World Natural Heritage Site. The Yaoshan Ancient Village is only 3 kilometers away from the world heritage property. It is a very typical Yao nationality village with well-preserved minority culture. Known as the Eastern Indians, the White Pants Yao ethnic group has lived here for generations, and is praised by UNESCO as "the living fossil of human civilization".

3. Material and methods.

3.1 Literature research.

Through various ways and methods, such as reading books and papers, reading literature and periodicals, browsing Internet websites, etc., after collecting, sorting out, analyzing and summarizing, the research guidance of world heritage protection and community sustainable development and other related theories is obtained. The relevant information in the practical Yaoshan Village is understood and mastered.

3.2 Field investigation.

Many field visits were made to the study area. Photography, survey, mapping and other methods are used to obtain detailed original data, investigate and collect the development history and current situation of the village, and master the path and preliminary results of its heritage protection and community development.

3.3 Analysis and summary.

Through summary, a model of world natural heritage protection to promote sustainable development of minority communities is established.

4. Results.

4.1 World Natural Heritage Protection Measures.

(1) Develop plans to promote both conservation and utilization of the world heritage site.

The Conservation and Management Plan for the South China Karst World Natural Heritage, the Special Plan for Libo World Natural Heritage Conservation Project, the Master Plan for Guizhou Maolan National Nature Reserve (2022–2030), the Master Plan for Libo Zhangjiang Scenic Area (2022–2035) and other related plans have been formulated. The delineation of the "three districts and three lines" in the territorial space planning has been completed, and the preparation of the "Master Plan for Libo World-class Tourist Attractions" is being promoted. Through the preparation and implementation of various types of planning, the protection and control of the heritage site are classified, scientific development and utilization, and the win-win situation between resource protection and local economic and social development is promoted.

(2) Protect the surface and underground resources and environments, and coordinate the protection and management of mountains, rivers, forests, fields, lakes and grasslands.

Measures such as afforestation, rock desertification control and soil erosion control have been taken to improve the forest coverage and ecological environment. Urban sewage pipe networks have been renovated, a number of township sewage treatment plants been built, rural domestic sewage treatment facilities been constructed, etc. In cooperation with Guizhou Normal University and Beijing Jinglang Ecological Technology Co., Ltd. to carry out surface and underground water quality monitoring, and carry out "natural-based solutions" water purification and algae control pilot work in Wolongtan, introduce local water purification zooplankton, indigenous benthic animals and indigenous fish in batches, and initially establish a water ecosystem with water purification and algae suppression effect. Wolongtan algae has been effectively controlled. Libo is also creating a Southwest Karst National Park to further strengthen the karst protection.

(3) Expand ideas to promote cooperation, and carry out in-depth resource investigation and research.

The local government actively cooperate with the Chinese Academy of Sciences, Guizhou Normal University, Guizhou University and other units to carry out scientific research and build the first "large sample land" of karst forest ecosystem in Southwest China that is in line with international standards. Since 2007, more than 60 monographs have been published, 50 master and erudite papers finished, and more than 1,000 papers been published. The relevant scientific research results provide a solid foundation for the conservation management and sustainable development of Libo World Natural Heritage Site.

(4) Actively promote international exchanges and communication.

Libo Karst has established friendly relations with Mammoth Cave in the United States of America and world heritage in France. In cooperation with relevant units of UNESCO, it has successfully held the "World Heritage and Sustainable Development" Forum and the "The Way of Nature Runs" UNESCO World Heritage Site Games, and jointly issued the Libo Consensus and Libo Declaration. The good experiences of Libo were presented in the 44th session of the World Heritage Committee.

(5) Develop tourism and lead the county's economic prosperity and development.

Libo pay attention to the influence of World Heritage sites. Libo implement the development strategy of strong tourism county, innovate the mode of global tourism to drive global poverty alleviation, build tourism complexes with deep integration of "tourism +", such as cultural tourism, industrial tourism, agricultural tourism, physical tourism, health tourism and research and study tourism, and promote community residents to get jobs in tourism-related industries. The tourism industry promotes the expansion of the whole area, accelerates the gathering of all factors, deepens the integration of the whole industry, and mobilizes the participation of the whole society, comprehensively drives the high-quality development of rural revitalization, and grows from a single industry to a whole-area pillar industry leading the green rise of the county economy.

(6) Extend publicity to enhance public awareness of natural heritage protection.

The publicity manual of Libo World Natural Heritage has been compiled and distributed, and publicity and education activities such as introducing World Natural Heritage Protection Knowledge into Schools, communities, scenic spots and market towns have been carried out. The Libo World Heritage Site has been promoted at the "China World Natural Heritage Day Achievement Exhibition", the theme activity of "Earth Emerald Romantic Qiannan Prefecture" at the Beijing International Horticultural Expo, and the Book Guizhou. Firmly grasp the popularization and education activities. It has edited and published popular science picture books and reading materials, and carried out popular science publicity through television and the Internet. Push fairy eight color thrush video information honored CCTV "secret eyes". Effectively raise public awareness of natural heritage protection.

4.2 Sustainable Development of Minority Communities Promoted by World Heritage Protection.

In the past, Yaoshan was famous for its poverty. Today, Yaoshan is famous for tourism. In recent years, Yaoshan Township, relying on the brand and resource advantages of Libo World Natural Heritage Site, takes advantage of the location advantage near the Da-Xiao Qikong scenic spot, deeply taps into and makes full use of Yao's unique bronze drum culture, architecture culture, clothing culture, gyro culture and other national cultures, and transforms its cultural resource advantages into tourism resources and economic advantages. Through the "heritage value + intangible cultural heritage + national culture + N = tourism +", with the "five becomes" starting point, deepen the diversified development of tourism poverty alleviation, and create a new pattern of beautiful countryside.

(1) Villages become scenic spots.

Relying on the traditional villages such as Libo Yaoshan Ancient Village and Dongmeng Ethnic Village, focusing on ethnic culture, taking advantage of the location close to Libo World Heritage Site, the traditional village style of Yaoshan in Lappian Ancient Village has been changed into a very attractive scenic spot, improving tourism service supporting facilities, transforming and upgrading traditional villages into tourist attractions, and successfully building Yaoshan Ancient Village into a national 4A level scenic spot in May 2020. Now the national culture tourism become the leading industry of Lappian village.

(2) Skills become skills used for tourism.

The Yao people of the ancient village of Yaoshan in Libo have very exquisite traditional skills, including monkey drum, top, Yao embroidery, paste dyeing, Yao pottery,

etc., which have become an important part of skills attracting tourists to visit and experience. Local governments carry out training on intangible cultural heritage of the Yao ethnic group, and through the mode of "co-operation-association-mass", they have built 24 workshops for poverty alleviation such as Yao embroidery, gyro and pottery, directly solving 130 jobs for the villagers, and leading more than 360 people from 275 households around to engage in tourism industries such as Yao embroidery, yarn spinning and handicrafts processing. Cultural poverty alleviation and "poverty alleviation at home" have become a bright business card for poverty alleviation in Yaoshan.

(3 Houses become hotels.

Adopting the model of "cooperative – company – farmers" and "cooperative – able people – farmers", the 36 old buildings of farmers in Lapien Village were transformed into folk inns and hotels, driving 46 households and 186 people to develop rural tourism reception to increase income and get rich, and the villagers can get employment at their doorstep, take the "tour bus", eat the "tourist meal", and create the "miracle" of getting rich.

(4 Villagers become actors.

Focusing on the development of Yao culture and tourism scenic spots, the Yao culture painting base has been built to attract art teachers, students and painting enthusiasts in colleges and universities to draw and sketch. Cooperation agreements have been reached with more than 70 colleges and universities, and more than 20,000 teachers and students in more than 80 batches have come to the village to sketch, directly providing stable employment for 18 people, and more than 30 people are engaged in farm scene work in Yaoshan Ancient Village scenic spot. Three Yao art performance teams of more than 80 people were formed to perform ethnic reality scenes in the scenic spot, and more than 300 Yao people were hired as models, with an increase of more than 3,000 yuan per capita.

(5 Products become commodities.

Through the "scenic area + farmers", "poverty alleviation workshop + farmers", "able people + farmers" and other models, they actively develop order agriculture, order tourism commodities, guide and encourage the masses to engage in agricultural special products breeding and ethnic handicrafts, creative handicrafts development, promote the transformation of agricultural products into commodities, further enrich the form of tourism scenic areas, and drive the masses to increase income and get rich. At present, more than 600 people from more than 450 households in the scenic spots, poverty alleviation workshops and sketched tribes develop agricultural special products breeding and handicrafts processing and sales, get on the "tour bus", eat the "travel meal", and launch the "tourism money".

4.3 Model Establishment.

Model of World Natural Heritage Protection to Promote Sustainable Development of Minority Communities was established. The protection of World heritage sites and the sustainable development of ethnic communities around the sites are interrelated and influence each other. If it can be well coordinated, like the case in this paper, there will be positive feedback: World heritage protection effectively promotes the preservation of world heritage values, the improvement of ecological environment and cultural display in the heritage sites and surrounding areas, greatly improves the living standards of the people of the minority communities in the heritage sites and surrounding areas, and promotes sustainable social and economic development; At the same time, the improvement of the production and living conditions of the residents in the surrounding communities has directly promoted the promotion of the awareness of protection, and more cherish the world heritage and protect and inherit it with intentions. Of course, if it is not well coordinated, it will also bring negative feedback effects.

5. Discussions and conclusions

5.1. World heritage is the common wealth of all mankind, and the protection, conservation, presentation and transmission of World heritage are very important. The Libo

Karst World Natural Heritage Site of the South China Karst has taken effective measures and been effectively protected.

5.2. Village communities in World Heritage properties and buffer zones face conservation and development issues. How to develop is a major challenge. Yaoshan Township in the buffer zone of Libo World Natural Heritage Site, relying on the outstanding natural heritage resources and local unique culture, has explored five "becomes" to achieve sustainable development of the village.

5.3. World heritage protection can provide high-quality natural resources, tourist resources and policy resources for the development of village communities, and the development of village communities can feed the protection of World natural heritage in terms of raising the awareness of local residents, improving the economic level, improving the appearance of villages and other aspects.

A SINGLE LATENT PLANT GROWTH-PROMOTING ENDOPHYTE BH46 ENHANCES *HOUTTUYNIA CORDATA* THUNB. YIELD AND QUALITY

Xi-tao Wang, Kai Yan, Tian-hua Yu, Zhan-nan Yang¹, Shi-qiong Luo¹
Guizhou Normal University, Guiyang city, Guizhou Province, China,
¹shiqiongluo@163.com

Plant growth-promoting endophytes (PGPE) can effectively regulate plant growth and metabolism. The regulation is modulated by metabolic signals, and the resulting metabolites can have considerable effects on the plant yield and quality. Here, tissue culture *Houttuynia cordata* Thunb., was inoculated with *Rhizobium* sp. (BH46) to determine the effect of BH46 on *H. cordata* growth and metabolism, and elucidate associated regulatory mechanisms. The results revealed that BH46 metabolized indole-3-acetic acid and induced 1-aminocyclopropane-1-carboxylate deaminase to decrease ethylene metabolism. Host peroxidase synthesis MPK3/MPK6 genes were significantly downregulated, whereas eight genes associated with auxins, cytokinins, abscisic acid, jasmonic acid, and antioxidant enzymes were significantly upregulated. Eight genes associated with flavonoid biosynthesis were significantly upregulated, with the CPY75B1 gene regulating the production of rutin and quercitrin and the HCT gene directly regulating the production of chlorogenic acid. Therefore, BH46 influences metabolic signals in *H. cordata* to modulate its growth and metabolism, in turn, enhancing yield and quality of *H. cordata*.

AN ASSEMBLED BACTERIAL COMMUNITY ASSOCIATED WITH *ARTEMISIA ANNUA* L. CAUSES PLANT PROTECTION AGAINST A PATHOGENIC FUNGUS

Yu Wang¹, Zhan-nan Yang², Shi-qiong Luo¹
¹School of Life Sciences, Guizhou Normal University, Guiyang, Guizhou, China,
**²Key Laboratory for Information System of Mountainous Areas and Protection
of Ecological Environment of Guizhou Province, Guizhou Normal University,
Guiyang, Guizhou, China, ¹shiqiongluo@163.com**

The microorganisms associated with a plant influence its growth and fitness. These microorganisms accumulate on the aerial and root surfaces of plants, as well as within the plants, as endophytes, although how the interaction between microorganisms protects the plant from pathogens is still little understood. In the current study, the impact of assembled