

Study on the Construction Status and Science Popularization Methods of Qinling Zhongnanshan UNESCO Global Geopark

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Abstract

Qinling Zhongnanshan Global Geopark is one of the important global geoparks in China. Its unique geological structure and diverse landscape attract a large number of tourists to visit and explore. However, in the process of geopark development and construction, there are some areas that need to be improved, such as the science education. Therefore, this article aims to study the current construction status and popular science methods of Qinling Zhongnanshan Global Geopark, in order to provide valuable references for the management and popular science education of the Global Geopark. Firstly, an overview of Qinling Zhongnanshan Global Geopark is provided, including its geological features, beautiful sceneries and science popularization constructions etc; secondly, analyze the science popularization conditions of Qinling Zhongnanshan Global Geopark and present its science popularization modes; finally, several suggestions are proposed to improve the science popularization work of Qinling Zhongnanshan Global Geopark. This article proposes corresponding improvement suggestions based on the current situation of the science popularization construction in the geopark, in order to improve the quality of science popularization among geopark visitors. The significance of this study is to help geopark managers better understand the current situation of the geopark, master effective methods of science education, and further enhance the popularity and attractiveness of Qinling Zhongnanshan Global Geopark.

Keywords: Qinling Zhongnanshan Global Geopark, Science Popularization, Suggestions.

Introduction

Global geoparks are special areas with significant scientific, cultural, ecological, and economic value. They play an irreplaceable role in promoting sustainable development, protecting the ecological environment, inheriting human civilization, and promoting geological science. Therefore, conducting science popularization activities on global geoparks can enhance the cultural and scientific literacy of the public, promote the geopark's visibility and influence, guide the public to cherish and protect natural heritage, and promote the sustainable development of the tourism industry. Science popularization activities require various channels and forms, including exhibitions, lectures, interactive experiences, digital media, etc., to meet the needs and interests of different groups of people. In this paper, the author took Qinling Zhongnanshan UNESCO Global Geopark as an

example, analyzed its science popularization conditions and the according activities, and then gave some suggestions on its future the science popularization work.

Overview of Qinling Zhongnanshan UNESCO Global Geopark
Qinling Zhongnanshan UNESCO Global Geopark is located in Xi'an, Shaanxi Province, China, only 25km away from the city center. The geopark covers an area of 1,074.85km². Formally joined the Global Geopark Network in August 2009.

The geopark features geological relics of the Qinling orogenic belt, Quaternary geological relics, geomorphic relics, and ancient human relics. It consists of five distinct and interconnected regions: the Cuihuashan landslide landform area, the Lishan Rift Valley horst structure area, the ice crystal top ductile shear zone

and tectonic mixed rock area, the Yushan Island arc granite peak ridge landform area, the Naitaibai Plate collision suture zone, and the Quaternary glacier area.

Cuihuashan boasts a unique Chinese landslide wonder, where the scale of landslide relics is the largest in China and ranks third in the world, with a single landslide volume ranking first in the world. Mountains, rocks, caves, water, forests, temples, and other landscapes in Cuihuashan integrate into one, providing abundant tourism resources. The unique natural phenomenon has created a diverse stone forest in Cuihuashan, making it a "living fossil" and a "natural geological and geomorphological museum" for studying landslides.

The core landscape of Nanwutai Scenic Area is the granite scenic group, which is composed of gray white medium fine-grained granite, gneiss granite, etc., with developed faults and joints, clear characteristics of ductile shear zones, and abundant granite pegmatite veins.

The Huaqing Palace scenic area has formed an isolated earth barrier type fault block mountain, which has undergone great changes and left precious geological resources such as Neogene and Quaternary stratigraphic profiles and geothermal hot springs.

The Taiping Scenic Area mainly features water landscapes such as the filling of various mixed rocks in the ancient Qinling Mountains, valley erosion, and waterfall rockfall, as well as primitive forests, alpine meadows, and widely distributed peaks, cliffs, and ravines.

The unique high mountain granite landform and ice edge landform of Zhuque Scenic Area create a unique natural landscape.

The Wangshunshan Scenic Area has formed a spectacular peak ridge landscape.

The Heihe Scenic Area boasts a rich and colorful collection of Quaternary ancient glacial landforms and relics from Taibaihan, as well as mysterious and distant natural alpine meadows and primitive forests. The mountain building movement has created a picturesque green water landscape in the canyon.

The Lantian Ape Man Site Scenic Area has an upright human skull fossil dating back 1.1-1.15 million years. There are 12 national key cultural relics protection units, including Lantian Ape Man, Shangyu Ancient Road, Ziwu Plank Road, Zhou Qin Han Tang Dynasty flourishing garden palaces, religious ancestral temples, and the ancient Lantian jade, which are important representatives of the cultural resources in Qinling Zhongnanshan Global Geopark. More than 50 Paleolithic artifacts, over 2,000 animal fossils, and Quaternary loess profiles provide valuable physical materials for studying human evolutionary history, paleontology, paleoclimatology, paleogeology, and Quaternary geological activities; The complete vertical zoning lineage of organisms is an important gene bank in the warm temperate zone of East Asia; There are rare animals and plants represented by Qinling giant pandas, crested ibises, golden monkeys, Qinling golden antelopes, and one leaf grass living in the geopark; And since the Paleolithic era about 1.327 million years ago, ancient humans have been thriving and multiplying at the foot of Zhong-

nanshan. Therefore, this is the most representative area of harmonious coexistence between humans and nature, the birthplace of Chinese poetry culture and gardens, and a microcosm of the history and culture of the Chinese nation.

Analysis of Science Popularization Conditions in Qinling Zhongnanshan UNESCO Global Geopark

Current Status of Science Popularization Hardware Facility Construction

Qinling Zhongnanshan UNESCO Global Geopark Museum

Qinling Zhongnanshan UNESCO Global Geopark Museum, which integrates the natural and cultural aspects of the Qinling Mountains, has formed a leading science popularization venue system in China. With the main museum of Qinling Zhongnanshan UNESCO Global Geopark Museum as the center, according to regional characteristics, a number of distinctive science popularization venues have been established, including the main museum, Zhuque Museum, Lantian Ape Man Site Museum, Heihe Science Popularization Information Station, Qinling International Juvenile Campsite, Qinling Natural School, etc. Multiple characteristic exhibition halls, including the Earth Knowledge Hall, Geopark Hall, and Jinxiu Zhongnan Hall, have been established in the main museum to showcase the geological wonders, cultural history, folk customs, and development prospects of Zhongnanshan through graphic and textual displays, physical displays, multimedia displays, and 3D cinema displays. With a wide coverage, interesting content, and diverse interactive forms, the museum system provides a good platform for fully displaying geological relics, deepening geological science popularization, and improving the quality of science popularization, effectively enhancing the concept of protecting Qinling geological relics and ecological environment.

Cuihua Reading Room

Throughout history, both domestically and internationally, people have yearned to draw inspiration from nature for their creations. Love to read, read good books, and be good at reading have become a trend in Xi'an today, even in the mountains. In 1913, the Cuihua Reading Room by the Tianchi Lake in Cuihuashan was dedicated to spreading advanced scientific knowledge, making reading aspirations a trend in the surrounding areas. To vigorously promote nationwide reading, inherit library culture, and empower the deep integration of culture and tourism. You can sit facing the mountain at the Cuihua Reading Room, order a cup of coffee, hold a book, and fully enjoy the pleasure of slow life brought by the nature, savoring the wonderful world in the book.

Qinling Zhongnanshan UNESCO Global Geopark Digital Museum

Qinling Zhongnanshan UNESCO Global Geopark Digital Museum changes the 2,460m² exhibition content of the global geopark museum from "physical" to "virtual", which can be displayed to the public through websites, mobile phones and other media. With the help of "Internet plus", it provides the public with online exhibitions that are not limited by time and space, so that the public can freely enjoy the popular science pictures, articles, videos, exhibits and other related content in the physical museum without leaving home, achieving the same purpose as visiting the physical museum.

The construction of the digital museum can serve as a promotional medium for the geopark, establish new channels for com-

munication between the geopark and visitors and improve the science education function of physical museums.

Geopark Interpretation System

A comprehensive interpretation system has been established in the geopark, with 1,429 explanatory signs for geological relics, cultural relics, and biodiversity. Typical geological relics and landscape features are explained with words and pictures which are easy for visitors to understand. And the theme song and emblem of the geopark are designed and produced, which improve the geopark's recognition to the public.

Research Travel Base

The best research travel base for teenagers: Qinling International Juvenile Campsite, Qinling Natural School, and Heihe Science Popularization Information Station have been built, receiving more than 100,000 teenagers from more than 20 provinces and cities across the country, as well as South Korea, France, and Germany. Studying at Qinling Zhongnanshan Global Geopark has enriched children's knowledge reserves, improved their comprehensive literacy, and developed their innovative spirit and practical abilities.

Science Popularization Resources and Team Building Situation

Strength of science Popularization Team

There are currently over 80 tour guides in the geopark, providing science popularization and tour guidance services; During the winter tourism off-season each year, the geopark hires experts, who are university teachers and senior tour guides in geological relics and tour guide training, to provide training on geological relics, popular science knowledge, service etiquette and explanation methods for geopark guides.

Promotional Materials and Popular Science Reading Materials

The geopark is equipped with more than 10 types of promotional materials, and has successively published "Basic Knowledge of Qinling Zhongnanshan- The Most Beautiful Global Geopark", "Qinling Zhongnanshan Global Geopark Promotion Brochure", "Geopark Tour Guide Map", "Travel in Qinling Zhongnanshan Mountain" tour guide manual, "The Most Beautiful Global Geopark - Qinling Zhongnan Mountain" photography album, "Qinling Zhongnanshan Poetry and Odes", "Qinling Zhongnanshan Global Geopark Proceedings", etc; Produce promotional videos showcasing "Dragon Soaring in the South", "Beautiful Qinling Mountains, Enjoying in the South", the theme song of the geopark in both Chinese and English, the short film of "Beautiful Qinling Mountains" in traditional Chinese style, and the 3D animated short film of "Qinling Mountains Orogenic Movement and Cuihua Mountain Landslide"; The website also offers e-books and slides to provide more convenient science education information to the general public.

Design of Science Popularization Mode for Qinling Zhongnanshan UNESCO Global Geopark

Geopark Science Popularization Objectives and Targeted Visitors

Science popularization objectives

Enhance the public's interest in Qinling Zhongnanshan UNESCO Global Geopark.

Enhance the public's understanding and cognitive level of geological knowledge.

Increase public awareness of appreciation and protection of natural geological relics.

Promote public attention to the evolution history and natural environment of the Earth.

Guide the public to form a good concept of ecological environment protection.

Targeted Visitors Analysis

Tourists

Tourists including domestic and foreign tourists, tour groups, and individual tourists. They are interested in the landscapes and geological phenomena in the geopark and hope to learn relevant knowledge through science popularization activities.

Students: mainly primary and secondary school students and college students. Science popularization activities can help them increase their geological knowledge, cultivate scientific literacy and environmental protection awareness.

Organizational structure: such as schools, research institutions, communities, etc., have a high demand for science popularization education in geoparks, and carry out science popularization propaganda and cooperation exchanges.

Local governments and decision-makers: For government departments with decision-making and management responsibilities for promoting the development and protection of geoparks, science popularization activities can provide scientific support and knowledge consultation.

Selection of Science Popularization Methods and Case Introduction

Design Targeted Activities for Different Groups

For students

Introducing science popularization lectures to students in schools, allowing students to understand and cherish the Great Qinling Mountains, understand the unity of knowledge and action, and inspiring students to explore the mysteries of science outdoors. The science popularization lecturers make the science popularization interesting and attractive, which won rounds of applause from everyone. At the same time, there is also a prize-winning knowledge quiz interactive session on site, further conveying Earth Day theme knowledge to primary school students and telling the story of natural conservation in the beautiful Qinling Mountains.

Students are invited to take participation in activities in Qinling International Juvenile Campsite and Qinling Nature School as well, where the science popularization facilities are richer and more professional and students can go into the mountain to experience and explore.

For ordinary visitors: Organize Qinling Defender Hiking Activities, "Integration of Culture and Tourism for a Better Life", "Cloud Music Concert" and Cuihuashan Hiking Festival, etc.; The Zhongnan Cultural Scholars Reading and Sharing Club aims to make the geopark hear the sound of history, remember

historical changes, and feel the traces of time, creating a scenic area with culture, connotation, and soul; Cloud Music Concert, Cuihuashan Landslide Scenic Area in Qinling Zhongnanshan Global Geopark, delved deep into the hinterland of Qinling Mountains, leading people on a geological exploration journey of landslide wonders with notes and melodies. XSO Xi'an Symphony Orchestra&Choir and Xi'an Concert Hall Children's Choir allowed people to experience breathtaking geological wonders in the mystery of music through their instruments and beautiful voice.

For local residents: The series of science popularization activities, including Asia Pacific Geopark Week, World Earth Day, International Museum Day, and National Science Popularization Month, Qinling essay contests and photography contests aim to enhance the influence of science popularization in geoparks, promote the dissemination of earth science knowledge, attract public care for our planet, and promote the sustainable development of nature reserves such as geoparks.

Exploring Routes

For professional visitors: The Qinling Zhongnanshan Global Geopark is composed of 2 scientific research routes: Heihe scientific research route and Fengyu scientific research route, which have the most classic and well-preserved geological relics.

For ordinary visitors: 9 geological routes, which are more entertaining and interesting, are provided.

Suggestions on Strengthening the Science Popularization Work of Qinling Zhongnanshan Global Geopark Diversified Forms of Science Popularization

Organize various forms of science popularization activities, including lectures, guided tours, exhibitions, scientific experiments, etc., to meet the needs and interests of different audiences. At the same time, by combining modern technologies such as virtual reality and immersive experiences, more vivid and interactive popular science content can be provided.

Regularly organize science popularization activities: develop science popularization activity plans, organize a series of science popularization activities annually or regularly, and attract

more tourists and students to participate. Geological knowledge lectures, outdoor exploration activities, geological cultural exhibitions, etc. can be held to deepen the public's understanding and knowledge of geoparks.

Strengthen the enrichment of science popularization education resources: Establish science popularization education centers or venues, equip advanced display facilities and models, produce science popularization materials with pictures and texts.

Establish a cooperation mechanism: Establish long-term and stable cooperative relationships with schools, community organizations, research institutions, etc., and jointly carry out science popularization activities, such as geology research, science popularization activity and material development, and students promotions etc.

Strengthen talent cultivation: Cultivate a team of professional science popularization guides, provide relevant training and education, so that they have a deep understanding of geopark related knowledge, and can effectively disseminate geological science popularization content to the public.

Creating multimedia popular science materials: Creating popular science promotional videos, posters, manuals, and especially the multimedia popular science materials to facilitate the public's access to and dissemination of geological knowledge at any time.

Guide social media participation: Utilize social media platforms to expand the influence of science popularization propaganda, publish science popularization information, activity notifications, and interesting geological knowledge of geological parks, and attract more people to participate and pay attention.

Please note that in implementing these measures, attention should be paid to the accuracy and authority of science popularization information, respect the principles of natural environment and ecological protection, and ensure the scientific nature and sustainable development goals of science popularization content.