Study on Status, Problems and Countermeasures of Developing Popular Science Tourism of Geoparks in Yunnan, China

Wufu Qi 1, Xianfeng Cheng 1, Qianrui Huang 1
1 Yunnan Land and Resources Vocational College, 652501 Kunming, Yunnan, China
qiwufu@163.com

Abstract. Tourism development of Yunnan geoparks keeps in the stage of “sightseeing tour” and the real “popular science tourism” keeps in the explorative stage, thus it has a series of problems, such as uncorrelation between tourist attractions and geology, uncorrelation between geologic observation spot and tourism, and insufficient scientifi city of commentary, etc. By aiming at these problems, corresponding countermeasures and suggestion were proposed.

1. Introduction
The geologic body contains some unique geological information and other information and it is the “synthesis of substances and energy composed of rock, soil and underground water under the natural action” [1]. Before geoparks are established, many of them have been established into tourism areas (such as scenic spots, forest parks and holiday resorts). As a result, the “information” makes a general reference: experience, science, religion, ethics, myth and aesthetics—any information that it can attract tourists to consume can be used for tourism development. The tourism development has the primary feature of “core tourism products” and it is called as “sightseeing tourism development type” [2].

As the “information carrier” of geologic body in geoparks, the “information” almost refers in particular to the typical and rare geological (scientific) information after establishing geoparks—in order to promote “scientific taste” of the original sightseeing tour products and stand out intrinsic value of geoparks, tourism developers try to display the information in the popular science way that common tourists can accept. Thus, it is called as “sightseeing tourism development type.”

Until January 16th 2017, Chinese Ministry of Land and Resources has approved 201 national geoparks in succession, including 10 geoparks in Yunnan (figure 1) [3]. With the typical cases of “Kingdom of Geology”—Yunnan geoparks, status, problems and countermeasures of popular science tourism development in geoparks were analysed.

2. Popular Science Tourism Development Status in Yunnan Geoparks
10 Yunnan geoparks include national geopark of peak forest karst in Yunnan Stone Forest, national geopark of Yunnan Chengjiang fauna paleontology (the first batch, April 2001); national geopark of Yunnan Tengchong volcano geotherm (second batch, February 2002); national geopark of Yunnan Lufeng dinosaur; national geopark of Yunnan Yulong Yiling—Laojun Mountain (third batch, February, 2004); national geopark of Yunnan Dali Cangshan (fourth batch, April, 2005); national geopark of Yunnan Lijiang Yulong Snow Mountain and national geopark of Yunnan Jixiang Gorge Cave (fifth
batch, August 2009); national geopark of Yunnan Luoping biota and national geopark of Yunnan Luxi Alu Hole (sixth batch, November 2011), respectively.

Figure 1. Distribution of Chinese National Geoparks

2.1. Overview of Yunnan Geoparks

2.1.1. Levels. Level features of 10 Yunnan Geoparks are shown in table 1.

Table 1. List of Level Features of Yunnan Geoparks, Data source related data in Chinese geopark website

| Levels         | Geoparks                                                                 | Remarks                                      |
|----------------|--------------------------------------------------------------------------|----------------------------------------------|
| Unesco Geoparks| National geopark of peak forest karst in Yunnan Stone Forest and national geopark of Yunnan Dali Cangshan | Approved by UNESCO                           |
|                | National geopark of Yunnan Chengjiang fauna paleontology; national geopark of Yunnan Tengchong volcano geotherm, national geopark of Yunnan Lufeng dinosaur, national geopark of Yunnan Yulong Yiling—Laojun Mountain, national geopark of Yunnan Lijiang Yulong Snow Mountain, national geopark of Yunnan Jiujiang Gorge Cave, national geopark of Yunnan Luoping biota and national geopark of Yunnan Luxi Alu Cave | Approved by Ministry of Land and Resources of PRC on behalf of the Central government |
| National Geoparks| -                                                                       | Selection and construction of state geoparks and county geoparks haven’t been developed in Yunnan yet. |
| State Geoparks and County Geoparks | -                                                                       |                                              |


2.1.2. **Land Use Scale.** Land use scale features [4] of 10 Yunnan geoparks are shown in table 2.

| Levels         | Geoparks                                                                 | Remarks          |
|----------------|--------------------------------------------------------------------------|------------------|
| Small-scale Geoparks | National geopark of Yunnan Chengjiang fauna paleontology (total areas: 18km²), national geopark of Yunnan Luxi Alu Hole (total areas: 38.7km²; areas of subject geological relics: 18.3km²; subject area of Alu Cave park: 6.8km²) | ≤20km²           |
| Middle-scale Geoparks | National geopark of Yunnan Tengchong volcano geotherm (core zone areas: 100km²), and national geopark of Yunnan Luoping biota (areas of subject geological relics: 33.11km²) | 21km²≤areas≤100km² |
| Large-scale Geoparks | National geopark of peak forest karst in Yunnan Stone Forest (total areas: 400km²), national geopark of Yunnan Lufeng dinosaur (total area: 260km²; areas of subject geological relics: 170km²), national geopark of Yunnan Lijiang Yulong Snow Mountain (total area: 260km²; areas of subject geological relics: 170km²) and national geopark of Yunnan Jiuxiang Gorge Cave (total areas: 167.14km²) | 101km²≤areas≤500km² |
| Oversized Geoparks | National geopark of Yunnan Yulong Yiling—Laojun Mountain (total areas 1110km²) and national geopark of Yunnan Dali Cangshan (total areas 577.1km²) | Areas≥500km²     |

Data source: relevant information of China geological environment information site

2.1.3. **Geological Relics.** Geological relic features of 10 Yunnan Geoparks are shown in table 3.

| Geological relic features | Geoparks                                                                 | Remarks                                      |
|---------------------------|--------------------------------------------------------------------------|----------------------------------------------|
| Landform                  | National geopark of peak forest karst in Yunnan Stone Forest National geopark of Yunnan Dali Cangshan National geopark of Yunnan Tengchong volcano geotherm National geopark of Yunnan Yulong Yiling—Laojun Mountain National geopark of Yunnan Lijiang Yulong Snow Mountain National geopark of Yunnan Jiuxiang Gorge Cave National geopark of Yunnan Luxi Alu Cave | Karst landform Glacial landform and erosional landform Volcanic landform Danxia landform of plateau and mountains Glacial landform Karst landform Karst landform |
| Paleontology              | National geopark of Yunnan Chengjiang fauna paleontology National geopark of Yunnan Lufeng dinosaur National geopark of Yunnan Luoping biota | Palaeoinvertebrates Palaeovertébrés and paleobotany Palaeovertébrés and paleobotany |
| Water body                | National geopark of Yunnan Tengchong volcano geotherm | Geothermal spring |

2.2. **Popular Science Tourist Development Status Analysis of Yunnan Geoparks**

Before establishing Yunnan geoparks, the development status of “scientific information” in geologic body” is unsatisfactory. Scientific content is generally lower. Lots of geologic bodies in many tourist areas are available for tourists to view the small-scale geologic body in a close distance. The “scientific information resources” are far away from being well developed. Development information generally includes analogy of empirical information, personification and zoosemy or it is partial to tales of...
legendia, such as “Ashima”. These scenic names and commentaries are easy to misunderstand tourists to notice appearance of scenes, instead of scientific causes.

After Geoparks are established, the unique geological (scientific) information contained by the geologic body can be valued to some extent. The investigation of professional geological workers is revealed. In order to improve the so-called “scientific taste” of the original sightseeing tourist products, tourist developers almost attach the information to or integrate it to “watching focus” in the form of “knowledge points”. What’s more, some “geological (knowledge) points” are developed as core tourist products, thus the dilemma of carrying out popular science tourism is generated under the circumstance [5].

Generally speaking, for landform relics in geoparks or geoparks giving priority to landform relics, visitors can see it in naked eyes and image “what does it look like?”, such as Stone Forest in Yunnan—“Sun Wukong”, “Lovers” and “Flyer” and so forth. Even if tour guide uses theories and knowledge of geomorphology to explain it to visitors, some visitors may be extremely interested in it, but “empirical analogy and tales of legendia” contained in geological body of scenic spots greatly attract visitors from the current status. Relatively speaking, this is easier to be accepted, comprehended and consumed than “geological science information. Many visitors once sighed with emotion, “I am extremely sensitive to it. I want to see and listen to it, but I can’t understand it at all. Therefore, I have to give up.” As a result, such tourism actually is the traditional sightseeing dominance type.

For geoparks with stratum, paleontology and construction relics or geoparks giving priority to geological relics, such as national geopark of Yunnan Chengjiang fauna paleontology, it may not have great attraction for both common visitors or expert visitors in non-geological paleontology—firstly, visitors can’t use naked eyes to experience “reputation”, “beauty” or “peculiarity” in these landscapes. They only can be based on existing background knowledge and experience abstract scientific principles in these landscapes through reflection. As a matter of fact, no visitors can really understand it. Secondly, except that tour guide in geoparks has accepted systematic education of geological geomorphology, almost no one can figure it out.

What’s the value when geological landform relics in geoparks are used as tourist attractions? How to use the mode accepted and interested by common visitors to present the value? Obviously, this is the core problem of popular science tourist development. For this problem, we can’t handle affairs with emotional reasoning. Instead, it is necessary to do intellectual scientific study and analysis.

3. Existing Problems in Geological Popular Science Tourist Development in Yunnan Geoparks

3.1. Uncorrelation between Common Scenic Spots and Geology [6]

Walking in the stone forest, there are numerous pictographic stones, including food eaten by two birds, Peacock combs wings, appearance of phoenix, elephant on the stone table, rhinoceros seeing the moon, Tang Monk Stone, Wukong Tone, Baijie Stone, Monk Sha Stone, Avalokitesvara Stone, General Stone, Poet Chant, Parent-son tourism and Ashima, etc. In addition, some stones are extremely similar to plants, such as bamboo shoots after a spring rain, mushroom and Yuguan flower, etc. “Stones” also have different tones [7].

The development of “watching focus” in essence has grotesque pictographic information in the geologic body, as well as additive tales of legendia. Pictographic rocks or animal-alike, person-alike or object-alike have concrete and vivid images and bright and clear outline. It is very easy to form the integrated sense of beauty between emotions and scenes, meanings and situations for visitors and it also makes visitors praise it as being created by nature. It is extremely skilful and miraculous. However, these scenic spots are always common and they almost have no correlation with “geology”—obviously, it is unmatched with the title of world geoparks.
3.2. Uncorrelation between Geologic Observation Spots and Tourism

In Tengchong Geopark, “columnar jointing scenic spot of basalt” is introduced as follows (figure 2). Basalt was cut into polygonal columns by fracture. Magma condensation process of cutting basaltic fracture is the primary joint. When basaltic magma surface realizes rapid condensation, there is a cooling center in the magma (such as olivine, pyroxene and plagioclase, etc.). Magma is shrunk to the cooling center. The fissure surface is formed on the cooling surface of vertical magma—joint. The cooling center distance is basically equal. Joint distance focusing on every cooling center is also the same. The regular polygonal columns of basalt developed in general hexagonal columns, but also pentagonal and heptagonal ones.

The development for such “scenic spots” moves towards another extreme. It totally lays particular emphasis on developing scientific information contained in the geologic body. Within 200 words, it contains “basalt”, “magma”, “primary joint”, “olivine”, “pyroxene”, “plagioclase”, “mineral”, “tension field” and “tension joint”, etc., which are “professional terms” involved in petrology, mineralogy and structural geology, etc, showing a “geologic observation spot” with strong academic style-a “scenic spot” titled as “popular science tourism” irrelevant of tourism.

![Figure 2. Columnar Jointing Display Card of Tengchong National Geopark](image)

3.3. Existing Problems of Explicatory Scientificity

In petrology, the rock constituted in stone forecast is called as “limestone”. There is famous “marble” in Dashan Cangshan. There is “pumice” around Tengchong crater.

However, in interpretation system, especially for visiting guide, it seldom distinguishes mineral from rock scientifically. The prominent performance aims to reach the so-called “easy understanding”. The above-mentioned rock is called as “limestone”, “marble” and “pumice stone”.

As a matter fact, stones in my daily life are called as the rock in geology. Various minerals are gathered to constitute different rocks and the earth’s crust is composed of rocks.

When the rock hasn’t formed an independent subject, no matter for mineral or rock, “stone” is in common use, such as limestone, granite and diamond. “Rock” and “rock” are mixed and it is confused.
Now mineral and rock have independently special subjects and proper nouns. The name of general minerals commonly uses “mineral” or “stone”, such as galena and calcite, etc. Rock name often uses “rock”, such as “granite, limestone and pumice, etc.

4. Suggestion on Carrying Out Geological Popular Science Tourism in Yunnan Geoparks

4.1. Scientific Interpretation System of Establishing Geoparks

The biggest feature of issuing national Geoparks is to separate some geological landscape from personification, zoosemy and some fairy tales to restore the original landscape of geological science. As a result, massif rock, geologic structure and paleontology of national geoparks are translated into appreciative scientific landscape. This is the important content of tourist development in geoparks[8].

Geopark museum is the media and important place for commentary education. It is the essential foundation to determine educational functions, service functions and use functions in geoparks can be developed [9]. Nowadays, there are lots of geographical exhibition halls or geological museums, with the purpose of using geological science to present geological phenomena. It is served for geological popular science services. On the contrary, geological popular science tourism exhibition halls are different. Lots of real objects in geological popular science tourism exhibition halls combine with modern high-tech means to display and narrate. All of them aren’t based on geological science. Instead, it is based on the interest caused by several geological phenomena in playing process and it is assisted by some geological science knowledge.

In addition, the interpretation system also includes tour description, interpretation manual and interpretation signboards, etc. Tour description has the larger flexibility. Interpretation contents and modes can be confirmed according to tourists’ interests. It can communicate with visitors face to face. High-level tour description can increase park attraction and customer satisfaction. Interpretation manual introduces basic information of geoparks. It is available for visitors to carry. This is an interpretation means, but also an effective promotional tool.

Interpretation signboards are set up along the paths or scenic spots. In the form of diagrams or characters, it explains the surrounding geological relic landscape, human landscape or natural phenomena with educational significance. Relevant contents are compiled by special geological workers. They always want to make it professional and conform to scientficity, but it neglects enjoyment and popularity. Due to short of geological knowledge, they can’t comprehend these contents. This reduces visitors’ appetency and interest in geological relic resources. Meanwhile, limited by conditions, it can’t write too much. Some professional terminologies can’t be understood by visitors or can’t meet demands of professionals. Therefore, it can’t ingratiate themselves from both bodes. According to the above-mentioned discussion, it must reach a consensus and it must divide different signboard types according to science of geological relics and degree of landscape property [10]. Parks shouldn’t be changed into a place to educate or infuse geological knowledge rigidly. It is necessary to teach through lively activities. After all, it is a park rather than rigid classroom.

4.2. Promotion of Professional Level in Geoparks

In the future development process of Yunnan Geoparks, it isn’t short of geographical professionals or tourist professionals or tourist and geological professionals. Instead, it is short of professionals of geological popular science tourism—geographical professionals are good at geographical studies and declaration of geoparks. Tourist professionals are good at sightseeing development in geoparks. Only professionals of geographical popular science tourism are likely to engage in geological popular science tourism development.

Tour guide of geoparks can’t be competent by general tourist guide, geological scientists, geological professional teachers or geological engineers. Only special and systematically trained geological tourist guide has the qualification to engage in tour guide of geoparks.
References

[1] W. F. Qi, “The study on definition of geopark concept and type division—based on ecological protection and tourist development coordination,” Resource Environment and Engineering, iss.4, pp. 163-167, 2011.

[2] W. F. Qi, “The study on sightseeing tourist development type of geoparks,” Memoir of Exploration and Study on Territorial Resources, pp. 56-59, 2011.

[3] http://cn.globalgeopark.org/fytt/distribution/6497.htm

[4] Chinese Ministry of Land and Resources, Overall Planning Guidance of Chinese National Geoparks, 2000.

[5] W. F. Qi, “Research progress of tourist resources in geoparks,” Green Science, iss.5, pp. 46-48, 2011.

[6] S. Q. Zhuang, “Discussion on geological tourist development and intellectual property protection in geoparks,” Memoir of the 10th National Regional Tourist Development, 2004.

[7] http://cn.globalgeopark.org/gyzt/one/shilin/jianjie/4950.htm.

[8] G. T. Yan, “Scientificity of national geopark interpretation planning,” Journal of Tongji University (Natural Science Version), vol. 35, iss.8, pp. 1133-1137, 2007.

[9] C. Fan, “Development and protection of national geoparks,” Theory of Commercial Age, iss.36, pp. 76-77, 2004.

[10] C. J. Wu, L. Y. Han, Y. K. Tao and J. Q. He, “The coordinative operation of national geoparks based on the protection and utilization of geological remains—a case study of the national geopark of the landslide landscape, Cuihua Mountain,” Journal of Mountain Science, vol. 22, pp. 17-21, 2004.