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# BUILDING AN EVALUATION FRAMEWORK OF ENVIRONMENTAL INTERPRETATION FOR CHINESE GEOPARKS---CASE STUDY OF YUNTAISHAN WORLD GEOPARK

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BUILDING AN EVALUATION FRAMEWORK OF ENVIRONMENTAL  
INTERPRETATION FOR CHINESE GEOPARKS---CASE STUDY OF  
YUNTAISHAN WORLD GEOPARK

by

DONGYING WEI

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## **ABSTRACT**

Environmental interpretation is a key tool for integrated management of tourism, with potential for greater use in managing visitor numbers, behavior and impacts, and enhancing experience. Evaluation is necessary to determine whether interpretation is achieving its goals. It is vital for park managers to know if their management is effective in order to determine what techniques can be used to address a particular problem.

The study first introduces the background of Geoparks, and clarifies the definition of environmental interpretation. Next, the study identifies the context that a comprehensive evaluation framework for environmental interpretation in Geoparks is used in order to help Geopark managers to institute the continuous improvement of environmental interpretation. The detailed objectives include: 1. To build an evaluation framework that can be used by Geoparks to evaluate environmental interpretation; 2. To use the evaluation framework to study Yuntaishan World Geopark; 3. To use the data provided by Yuntaishan World Geopark to identify the perceptions of the visitors; 4. To use the data provided by Yuntaishan World Geopark to identify the perceptions of experts and peers.

In the literature review, the purpose of interpretation evaluation is presented. In addition, the different kinds of interpretation evaluation are discussed, as well as the process, the methods and the criteria of interpretation evaluation.

A “logic model” is being applied to obtain the objectives of Yuntainshan Geopark regarding environmental interpretation. According to Maslow’s hierarchy of needs model, environmental interpretation can meet the functional needs, social needs and experiential needs which can be seen as the triangle of environmental interpretation evaluation. The

hierarchical structure of the evaluation indicator framework is established according to the triangle evaluation model of environmental interpretation, then the indicators of the evaluation are identified and their weights are calculated through Analytical Hierarchy Process (AHP). Then the evaluation indicator framework of environmental interpretation for a Geopark is built. In order to identify who to evaluate, the tripartite evaluation model of environmental interpretation is developed. The study takes Yuntaishan World Geopark as a case to evaluate the status quo of environmental interpretation from three aspects: self-evaluation, visitor evaluation and peer and expert evaluation, and make recommendation for improving the quality of the service.

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# **Building an Evaluation Framework of Environmental Interpretation for Chinese Geoparks Case Study of Yuntaishan World Geopark**

## **Chapter 1 Introduction of the Study**

### **1.1 Introduction**

*Evaluation is about making improvements. If all you want is praise, skip evaluation.... But if you want to do a better job, and you can face a little constructive criticism, evaluation can lead to making a better match between what you want to achieve and what actually might happen.*

---Serrell (1996)

Interpretive services can be viewed as a fundamental component of the visitation experience. Many people come to Geoparks with little or no understanding about the Geopark system, conservation, and tourism development constraints. Through interpretative programs, a Geopark's management can communicate these messages to visitors. Not only can they increase visitor understanding and appreciation for what they are experiencing but may also increase their commitment to natural and cultural resources conservation. Implementation of interpretation programs will also increase the quality of tourism products and services. It can enhance visitor experiences while they visit the Geoparks.

Used in combination with other regulatory management tools such as physical barriers and legal sanctions, environmental interpretation is frequently touted as playing a role in influencing visitor beliefs, attitudes, knowledge and behaviors and as such is purported to be a desirable visitor management tool (Hughes & Morrison-Saunders, 2005; Knapp & Poff, 2001; Kohl, 2004; Kuo, 2002; Moscardo, 1998). Interpretation has also

been identified as a means of entertainment, a tool for encouraging increased visitation to a site, encouraging repeat visitation, longer stays and greater visitor satisfaction (Bramwell & Lane, 1993; McArthur, 1994; Moscardo & Woods, 1998). Some or all of these perceived benefits often manifest in management aims and goals for natural areas (Kuo, 2002).

Environmental interpretation is a key tool for integrated management of tourism, with potential for greater use in managing visitor numbers, behavior and impacts, and enhancing experience. It is closely associated with a set of more specific tools that fit under the broad topic of interpretation - see visitor marketing, visitor centers, wayside exhibition, multimedia facility, personnel interpretation and guidebooks. Considerable potential exists to apply interpretation principles and techniques more fully in visitor information centers and in both guided and self-guided tours.

Evaluation provides information for decision making, allowing evidence-based decisions about program design and improvement, and the evidence needed to make strategic decisions about program investments. Patton (1997) said: "Evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future programming" (p. 36).

Evaluation of environmental interpretation is not driven solely by the need to comply with statutory or regulatory requirements. More importantly, a systematic evaluation process simply makes sense in the face of ever-increasing fiscal challenges. Evaluation is an important strategy of successful organizations because it delivers sound feedback on effectiveness. Evaluation builds organizational capacity to make decisions



based on systematic data collection and analysis. As such, it is a valuable tool for ensuring accountability, conducting performance assessments, evaluating budget prioritization, and strategic planning.

Evaluation is necessary to determine whether interpretation is achieving its goals. It is vital for park managers to know if their chosen management tool is effective, in order to determine what techniques can be used to address a particular problem. Managers are then prevented from spending scarce money on tools which do not work (Brownell, 2001).

In summary, evaluation is a tool for achieving management excellence and relevancy. For Chinese Geoparks, an effective and systematic evaluation method is needed and the focus of this research is building a systematic evaluation framework for Chinese Geoparks.

## **1.2 Background**

Since the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, where Agenda 21, the Agenda of Science for Environment and Development into the 21st Century, was adopted, the protection and enlightened management of the environment have been widely acknowledged as a top priority. UNESCO, the United Nations Educational, Scientific and Cultural Organization contributed to this priority by promoting the protection and sustainable development of geological heritage mainly through some program frameworks, like the World Heritage Convention and Global Geoparks Network (Eder, 1999).

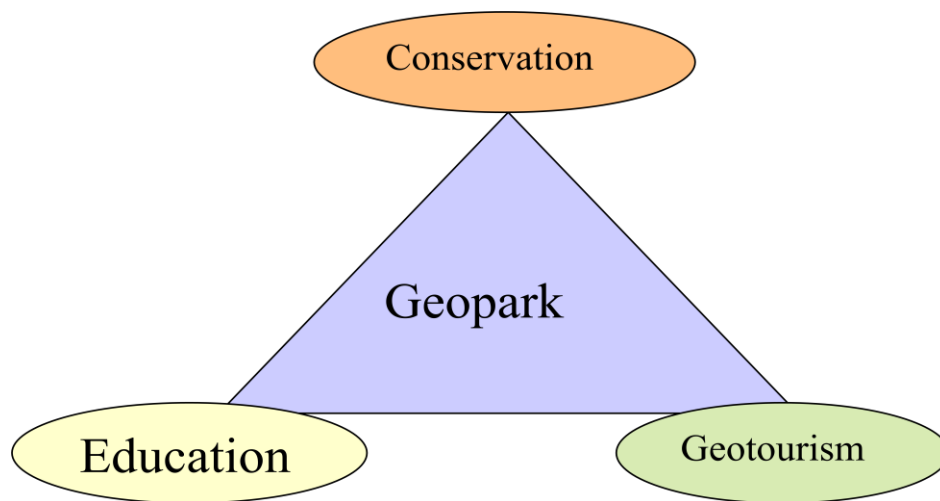
The ‘Geopark’ concept is a rapidly growing one, more so because of a growing consciousness among humankind worldwide for protecting nature, especially geo-

resources. This has precipitated into the birth of the ‘geoparks’ movement in some of the European Union countries in the year 2000, followed closely in China, paving way for creation of the ‘European Geoparks Network’ and ‘National Geoparks of China’. In early 2004, during an international meeting held at the UNESCO headquarters in Paris, a decision was taken by UNESCO to provide support to certain national geoparks, thereby paving the way for the creation of a new network, named as the ‘Global Geoparks Network’ (GGN). The aim of the GGN is to promote high quality standards in Geopark services, and the sharing of common strategies and best practice. This involves the integration of geo-conservation, geo-science education and geo-tourism development ( Figure 1.1). The GGN works in close synergy with many other organizations, such as UNESCO’s World Heritage Center, the Man and the Biosphere program (MAB), and World Network of Biosphere Reserves. Since the launching of the Network in 2004, 57 selected high quality National Geoparks from 18 countries (Australia, Austria, Brazil, China, Croatia, Czech Republic, France, Germany, Greece, Ireland, Italy, Iran, Malaysia, Norway, Portugal, Romania, Spain, United Kingdom) are currently members of the Global Geopark Network assisted by UNESCO (Wei, 2007).

A Geopark is a nationally protected area containing a number of geological heritage sites of particular importance, rarity or aesthetic appeal. A Geopark achieves its goal through a three-pronged approach (Figure 1.1), viz. conservation (a Geopark seeks to conserve significant geological features, and explore and demonstrate methods for excellence in conservation), education (a ‘Geopark’ organizes activities and provides logistic support to communicate geo-scientific knowledge and environmental concepts to the public, through various modes), and tourism (a ‘Geopark’ stimulates economic

activity and sustainable development through geo-tourism, and encourages the creation of local enterprises and cottage industries involved in geo-tourism and geo-products) (Dowling & Newsome, 2006).

Figure 1.1 Three Aspects of a Geopark

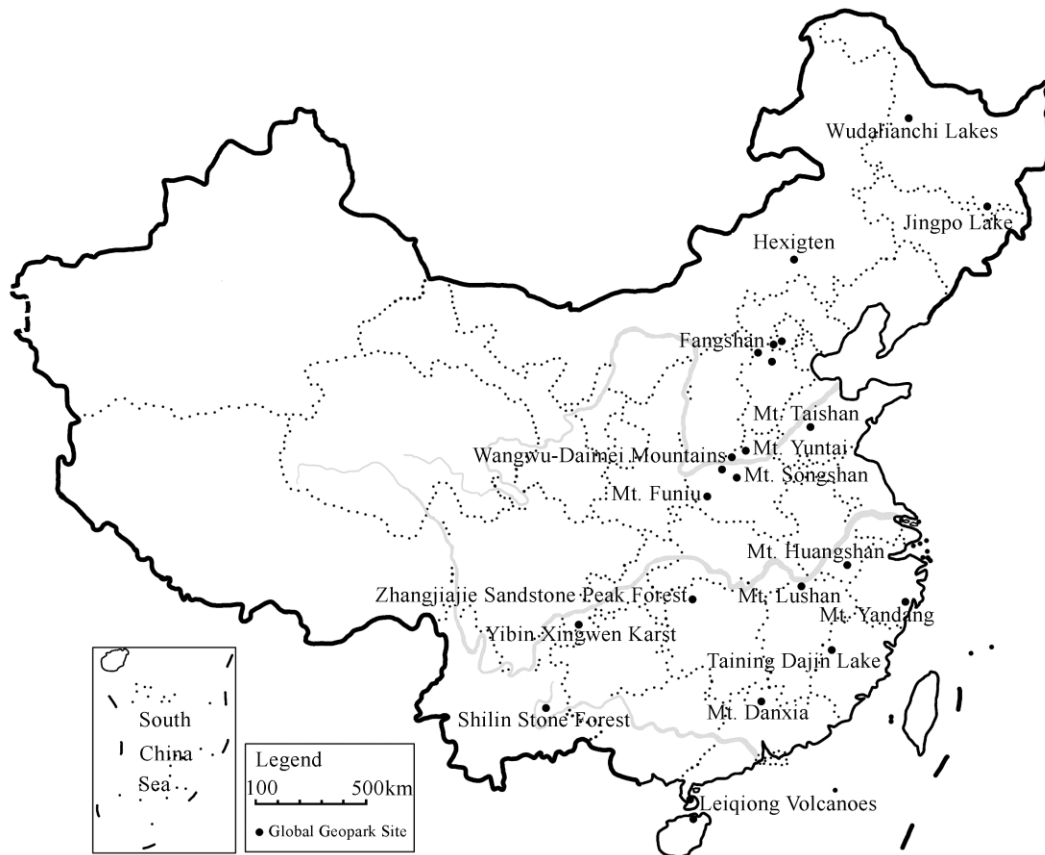


China set up 11 national Geoparks for the first time in the year 2000, under the guidance of the UNESCO Earth Science Division, and hence has become one of the pioneers in this aspect and till now China has established 138 national Geoparks and 21 of them are the members of Global Geopark Network (Zhao Xun & Zhao Ting, 2007).

Figure 1.2 shows the distribution of Chinese Geoparks and they are as follows:

- Wudalainchi Volcanoes Geopark in Heilongjiang
- Jingpohu Geopark in Heilongjiang
- Yuntaishan Geopark in Henan
- Songshan Geopark in Henan
- Funiushan Geopark in Henan

Figure 1.2 Distribution of Global Geoparks in China



Source: “Multi-designated geoparks face challenges in China’s heritage conservation” by Wang (2007, p. 192).

- Wangwushan-Daimeishan Geopark in Henan
- Huangshan Geopark in Anhui
- Lushan Geopark in Jiangxi
- Longhushan Geopark in Jiangxi
- Zhangjiajie Sandstone Peak Forest Geopark in Hunan
- Shilin Karst Forest Geopark in Yunnan
- Danxiashan Geopark in Guangdong
- Taining Geopark in Fujian
- Yandangshan Geopark in Zhejiang

- Xingwen Geopark in Sichuan
- Hexigten Geopark in Inner Mongolia
- Keshiketeng Geopark in Inner Mongolia
- Fangshan Geopark in Hebei
- Leiqiong Geopark in Heinan
- Taishan Geopark in Shandong
- Zigong Geopark in Sichuan (Ministry of Land and Resources, 2002).

But for many Geoparks, they have no specific education and interpretation planning and objectives, and lack detailed implementation and evaluation strategies (Wei, 2007).

### **1.3 Defining Environmental Interpretation**

In 1957, the term interpretation was spelled out by Tilden with his book, *Interpreting Our Heritage*, which has been regarded not only as classic philosophical literature, but also establishes the ideals or principles regarding the art of interpretation that are still being used at present (Kye, 2005). Tilden (1957) defined interpretation as: "An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information" (p. 9).

The interpretation field began to focus interest in ecological and environmental concepts during the 1960s and 1970s. With this mindset, interpretation grew dramatically during the Earth Day movement of 1970 and 1971 as can be seen by the number of new interpretive sites and programs that were added both in the U.S. and other developed countries. It was at this time that environmental interpretation became the common term

for the field of interpretation (Kye, 2005). Brown's Islands of Hope (1971) gave it a definition: "Environmental interpretation is that body of communications, devices, and facilities that conveys environmental knowledge, stimulates discourse on environmental problems, and results in environmental reform" (p. 77).

Other definitions of "environmental interpretation" from the literature include the following:

- Ham (1992) reinforced Brown's definition by elaborating that "Interpretation is simply an approach to communication. Environmental interpretation involves translating the technical language of a natural science or related field into terms and ideas that people who aren't scientists can readily understand" (p. 3).
- The National Recreation and Park Association's (NRPA, 1988) philosophy of environmental interpretation claims that environmental interpretation not only informs but is, in many cases, action itself.
- Risk (1994) defined that "Environmental interpretation is the translation of the technical and often complex language of the environment into nontechnical or lay language with no loss in accuracy in order to produce in the listener or participant the development or enhancement of sensitivity, awareness, understanding, appreciation and commitment" (p. 132).
- Reyburn (1974) thought "Environmental interpretation is a form of education by which civilized man can learn his function in the ecosystem" (p. 55).

- Mahaffey (1972) mentioned that “Environmental interpretation has emerged as a specific profession involved with educating the public primarily in formal recreation and park areas--especially those areas administered by various levels of government” (p. 23).

Analyzing the above definitions, we can conclude that environmental interpretation is a transformation through its communication, inspiration, provocation, and entertainment, which provides enjoyable recreational experiences to non-captive audiences in diverse settings, such as forests, wilderness areas, museums, zoos, historical or cultural sites, and all types of parks.

There are essentially two ways to deliver interpretation: personal services and media (non-personal) services. Personal services provide opportunities for visitors to interact with an interpreter in person. They include such things as informal contacts, talks, guided walks and demonstrations. However, personal services reach only as much as 22% of the visitors. In contrast over 62% of visitors receive interpretation through media services such as brochures, newspapers, audio tours and exhibit labels. Regardless of the type of interpretative service being provided, the definition of interpretation remains the same for both (Forist, 2003).

## **1.4 Study Context**

The goal of evaluation of environmental interpretation in Geoparks is to facilitate continuous improvement of interpretive service. Each evaluation method presented in this study results in a type of data with its own unique application. The data may show an individual interpreter needs to improve in subject research, visitor involvement or

presentation skills. The evaluation also provides data that can be used to identify needs within the entire Geopark such as further training, revised exhibits or new interpretive themes. So evaluation data can be used to address an element of a Geopark's interpretive services and also an entire Geopark's interpretation program.

Evaluation of environmental interpretation can provide short-term and long-term benefits for visitors, staffs and ultimately for the preservation of Geopark resources. Thus, it is very important for Geoparks to plan the evaluation strategy to produce and maintain high quality programs.

In order to maintain high quality service and keep the continuous improvement, the interpretive services need to be monitored and evaluated on a regular basis.

Environmental interpretation services include the complete interpretive offerings that a visitor might encounter in an individual Geopark. They include personal interpretation and interpretive facilities, as well as wayside exhibits, publications, orientation information, audio-visual media and more.

For evaluating the quality of environmental interpretation, a lot of questions can be asked, among them are the following:

- Is it possible to measure quality objectively?
- Whose perspective on the quality of a program is most important – the supervisor's, the visitor's or an expert's?
- How do Geoparks account for visitors' individual opinions, tastes and special needs?

In theory, a combination of perspectives and a variety of evaluation methods are more likely to provide balanced, reliable data about the quality of interpretive programs.



A supervisor may not see a program from the point of view of a visitor and a visitor may not understand the Geopark's mission and how interpretive programs support that mission(California Department of Parks and Recreation, 2006).

Interpretation is an art form. At its best it is inspirational, transformational communication. We cannot measure the quality of a visitor's inspirational experience, but we can evaluate the elements of good interpretive programs. It is very important to find meaningful measures of quality. Finding the measures is only the first step to gathering information and in turn using it to develop, test and implement improvements. (California Department of Parks and Recreation, 2006).

The constant and ongoing evaluation of environmental interpretation in Geoparks is essential to its success. This study develops an environmental interpretation logic model that identifies the educational objectives of Chinese Geoparks, and these key evaluation indicators leads to a detailed standard for environmental interpretation. In summation, this study identifies critical success factors for interpretation, their levels of importance, and builds the evaluation indicator framework. In addition, this study builds a tripartite evaluation model of environmental interpretation and uses Yuntaishan World Geopark as an example to evaluate the environmental. Generally, through this study, a comprehensive evaluation framework for environmental interpretation in Geoparks is built in order to help Geoparks to institute the continuous improvement of environmental interpretation.

### **1.5 Purpose of the Study**

In the Guidelines and Criteria for National Geoparks seeking UNESCO's assistance to join the Global Geoparks Network, UNESCO (2008) states in Part I – Criteria that

education is an important part of the sustainable development of Geoparks and they should meet the following criterion:

- A Geopark must provide and organize support, tools and activities to communicate geo-scientific knowledge and environmental concepts to the public (e.g. through museums, interpretive and educational centers, trails, guided tours, popular literature and maps, modern communication media). It also allows and fosters scientific research and cooperation with universities, and between geoscientists and the local populace.
- The success of Geopark educational activities depends not only on the content of tourism programs, competent staff and logistic support for the visitors, but also on the personal contact with the local population, media representatives and decision-makers. The aspects of wide community participation and capacity building on the local level (e.g. training of visitor guides) helps to develop a wide range of acceptance of the Geopark philosophy (and transfer of knowledge and information) in the population. It cannot be repeated often enough that local people are of primordial importance for the successful establishment and maintenance of a Geopark.
- Among the instruments available for the transfer of information are events such as excursions for school classes and teachers, seminars, and scientific lectures for the environmentally and culturally interested public and for residents who enjoy introducing their landscape to visitors. One of the main issues is to link geo-education with the local context, thus local students must learn the importance of their geological heritage. Creating geo-curricula for primary and secondary

schools, using the local information about geology, geomorphology and physical geography will help to preserve the Geoparks while at the same time reinforcing local awareness, pride and self-identity. Geoparks may be great educational tools at local and national levels.

- Within the educational concept, museums, 'discovery centers', interpretive centers and other innovative new tools must be developed to promote the principle of geological heritage conservation and the necessity of its safeguarding and archiving. The museums and centers also serve for developing different educational programs for visitors and local actors.
- All educational activities should reflect the ethical considerations around holistic environmental protection.

It can be seen from the above that education is emphasized in the guidelines. In order to achieve the aim of education in Geoparks, a systematic and scientific environmental interpretation is in the great need.

In China, environmental interpretation is just emerging and in many Geoparks there is no scientific wayside exhibition, maps and brochures and there are not education programs for children and no interpretation that is targeted at different age groups. For most of the interpreters, they have few chances to accept the regular training. Generally speaking, there is a lack of scientific environmental interpretation in many Geoparks in China. The Geoparks face the multiple challenges on how to establish a scientific environmental interpretation system, how to know the pros and cons of the interpretive service, how to improve the quality of environmental interpretation and provide better management.

This study focuses on building the evaluation framework of environmental interpretation for Chinese Geoparks. In order to do this, a systematic and comprehensive evaluation system need to be developed which combines qualitative and quantitative methods. A tripartite evaluation model which includes self-evaluation, visitor evaluation and expert evaluation is also developed in order to evaluate the environmental interpretation in Geoparks. In addition, it provides the bases for decision-making for Geopark management. The detailed objectives include:

1. To build an evaluation framework that can be used by Geoparks to evaluate environmental interpretation.
2. To use the evaluation framework to study Yuntaishan World Geopark.
3. To use the data provided by Yuntaishan World Geopark to identify the perceptions of the visitors.
4. To use the data provided by Yuntaishan World Geopark to identify the perceptions of experts and peers.

### **1.6 Significance of the Study**

Evaluation of environmental interpretation is an important strategy for effective Geopark management because it delivers sound feedback on program effectiveness and impact. Evaluation also builds organizational capacity to make decisions based on data collection and analysis. As such, it is a valuable tool for ensuring accountability and conducting performance assessment, budget prioritization, and strategic planning in Geoparks.

Of equal importance, conducting the evaluations helps Geoparks encourage a more reflective practice that leads to stronger programs, documents accomplishments, and

justifies investments. A culture of evaluation encourages staff to combine their intuition and experience with data collection, analysis, and use of results.

Essentially, a culture of evaluation demands that staff ask both formally and informally: How does my program work? What impacts are we having? What elements are most and least effective? What can I do better? What will be most effective for our visitors? What strategies will be most likely to help us reach our goals in the most cost efficient way? (California Department of Parks and Recreation, 2006)

Limited studies have been conducted to evaluate interpretive services such as interpreters, brochures, signs, interpretive media, and maps (Moscardo, 1998). Even fewer studies have been undertaken to study evaluation framework of environmental interpretation. No studies regarding interpretation evaluation in Geoparks are identified in the literature; therefore, this study served as the first of its kind in interpretation evaluation for Geoparks.

A systematic evaluation framework makes good sense in the face of ever-increasing fiscal challenges in Geoparks. Outcomes of this study may benefit a number of stakeholders such as interpreters, the educators, management staff of the Geoparks, and the visitors. The evaluation can help management staff improve efficiency and effectiveness at all levels of the environmental interpretation. For example:

- Field staff gain access to valuable tools to help them identify and share good experience, including mechanisms for the study of current and potential visitors and innovative use of technology to maximize visitor experience and employee effectiveness.

- Managers learn how best to make decisions to apply rigorous accountability measures that support continual management improvement.
- Meanwhile, internal and external stakeholders develop an enriched understanding of the state of environmental interpretation, thus helping to advance the work at the different levels (California Department of Parks and Recreation, 2006).

## **Chapter 2 Review of Literature**

Evaluation, auditing, coaching, assessment---these terms describe a set of powerful tools to make interpretation better service its clientele. Evaluation refers to the process of collecting and analyzing information about interpretive effectiveness. It considers message delivery, content, activities, connections, and creativity on one hand and visitor reactions and responsiveness on the other (Knudson, 2003).

The National Association for Interpretation (1990) defines evaluation of interpretation as a multidimensional process used to determine the qualities of interpretation and as an integral part of all interpretive operations. The process includes input and feedback and considers the interrelationship among people, organizations, environments, and technologies.

On the other hand, Ham (1986) states that evaluation may be further distinguished from other research activities by its focus on judgments about program effort, effectiveness, efficiency, and adequacy, its reliance on systematic methods, and its applied orientation to management and decision-making.

This chapter reviews the literature on evaluating interpretation in parks, zoos, museums, forests and other settings in which interpretation takes place. The focus is on evaluating interpretation not interpreters. This chapter discusses first the purpose of the evaluation, second the kinds of interpretation evaluation, third the process of evaluation; fourth the methods of environmental evaluation, and lastly the kinds of evaluation criteria.

### **2.1 Purpose of Interpretation Evaluation**

Any profession needs to evaluate the effectiveness and quality of its services if it is to continue to appropriately serve its clientele, as well as to be viewed as legitimate.

Interpretation is not an exception to the rule. According to Knudson, Cable and Beck (2003): “An organization that fails to evaluate indicates disrespect for its interpreters and disregard for the products of their work. This translates into little concern with the quality of experience of the visitors. To show value, evaluate” (p. 367). Much work has been done in regard to the need for, and the merits of, the evaluation of interpretive services. Ham (1986) completed a comprehensive literature review on this topic. Although his review is 23 years old, his list as to “why evaluate interpretation” is still valid today:

1. Present austerity has heightened public awareness of government spending, and increasingly agencies are required to demonstrate the cost-effectiveness of their programs.
2. Within agencies, different administrative units vie for limited operational funds. Showing measurable benefits of an interpretive program provides a competitive edge in the budget race.
3. Evaluation programs require periodic scrutiny of interpretive objectives to ensure that interpretive objectives reflect changes in agency mission, management policy, or political climate.
4. Evaluation provides feedback about individual interpretive services and the program as a whole.
5. Decisions about upgrading, updating, deletion, and addition of interpretive services become easier when the relative accomplishments of the services are known.
6. Objective evaluation of interpretive staff can reveal insights into training needs and hiring priorities (p. 11).



Echoing Ham's views, Knudson et al. (2003) emphasized the following:

“ . . . that every exhibit, every performance, every service, and the entire program merits serious, systematic, open, fair analysis, even if it is by the process of self-evaluation. Without using the various types of evaluation . . . interpreters have little basis for asking for new funding, new positions, and continuing support of administrators and funding sources. Likewise, unless they provide for evaluation, the interpreters and curators have only a vague sense of how effectively their programs serve the public – or even what portion of the public they serve now and perhaps whom they could serve with minor adjustments. With evaluation, they can put a value on their work and astutely improve it. ” (p. 383)

Evaluation provides immediate and long-term benefits for visitors, employees and ultimately for the preservation of park resources (California Department of Parks and Recreation, 2006).

## **2.2 Kinds of Interpretation Evaluation**

Evaluations can be classified according to the types of questions addressed or the methods utilized. A common classification is Wu et al. (2002) scheme, which suggests four major areas on which program evaluations should focus: summative evaluation, process evaluation, outcome evaluation and impact evaluation (see Table 2.1, p. 20).

In interpretation, the word "evaluation" usually means assessing program accomplishments after the program has ended (Ham, 1986). Wu's typology makes us think of other questions, some in need of answers before program implementation, others

during and after implementation. Following is an explanation of each of the four kinds of evaluation with examples of how they have been applied in evaluating interpretation.

Table 2.1. Four types of program evaluation (adapted from Wu et al., 2002)			
Type of Program Evaluation	Purpose	When used	Questions Addressed
<b>Formative Evaluation</b>	Identifies the “fit” between the program activities and the needs identified in the assessment	Before implementing the program – helps test the logic used in planning	* Will the activities meet the needs? * Can the program be improved before implemented?
<b>Process Evaluation</b>	Examines the actual activities used in the program compared to what was planned	During implementation – used to understand what is occurring in service delivery	*How are interventions related to outcomes? *What is actually happening compared to what was planned?
<b>Outcome Evaluation</b>	Looks at actual program outcomes	Immediately following the end of an activity or intervention cycle – used to determine the program’s short term influence	*Is the program achieving the predicted changes? *Is the program achieving any stated objectives?
<b>Impact Evaluation</b>	Assesses the net effect a program has had in the long term	After a program has concluded – at least a year after activities have ended	*Have the immediate effects been sustained over time? *Is the program making a difference over the long run? *What are the results of the program, both intended and unintended?

### 2.2.1 Formative Evaluation

Formative evaluation is typically used in program planning. This evaluation helps determine which program aspects or activities are most needed and for which population. Generally speaking, this method is used to help develop new programs or justify existing

program components (Wu, 2002). Formative evaluation is a systematic program planning tool that can help to:

- Identify client needs
- Clarify objectives
- Set priorities
- Identify strengths and weaknesses
- Plan changes
- Allocate resources

Questions addressed by formative evaluation might include:

- What services should the program provide?
- How should the program be organized?
- What are appropriate program objectives?
- What need(s) is the program addressing?
- What is the most effective way to provide services?

In interpretation, program planning evaluations are used to provide information for designing an interpretive program to address some specific problem. Chiang (2001), for example, collected information on visitor characteristics, visitation patterns, and visitor activities with the aim of improving interpretive planning in Taiwan National Science and Technology Museum. The results suggested that both composition and behavior of the audience changed during each day and throughout the week. Interpretive programming also could change to accommodate temporal differences in the visitor population. Caughey (2003) outlined three broad categories of information that might be helpful to interpretive planners:

Visitor characteristics, visitor attitudes and visitor motivations and expectations. In his view, such data are needed not only a program is implemented but throughout the life of the program. Other studies have developed planning implications from data on visitors' expectations (Zeng, 2007), visitor characteristics and behavior (Chang, 1996), and visitors' patterns of participation in interpretive services (Ham, 2002).

### **2.2.2 Process Evaluation**

Process evaluation is geared to fully understanding how a program works---how does it produce that results that it does and can be seen as the process of program monitoring. Process evaluation is useful if programs are long-standing and have changed over the years, employees or customers report a large number of complaints about the program, there appear to be large inefficiencies in delivering program services and they are also useful for accurately portraying to outside parties how a program truly operates (McNamara, 2008). It is the most effective to begin the process evaluation when a program begins, so the evaluation should be planned when a program is in development stages. Process evaluation ideally is an ongoing process, including planning, data gathering, and analysis. Process evaluation could help to:

- Determine if the program is operating according to established policy
- Document how a program works
- Understand the impact of program changes
- Eliminate inefficiencies in program operations
- Remedy sources of the complaints from the visitors, staff etc.

There are numerous questions that might be addressed in a process evaluation. These questions can be selected by carefully considering what is important to know about the program, and they could have the following:

- How well is the program being implemented and what are the barriers to implementation?
- What is required for staff to implement the program?
- How is staff trained about how to deliver the program?
- How do visitors enter into the program? How do they exit?
- What do visitors consider to be strengths of the program?
- What does the program do well? What is not being done well?
- What are typical complaints from visitors?
- Are established program policies and procedures being followed?
- Are program resources being used efficiently? (McNamara, 2008).

According to Wu (2002), a program cannot benefit target audiences it never reaches. For most interpretive programs, they need to attract sufficient numbers of visitors to activities and facilities and justify continuation of services according to that. Today, number of visitor contacts is a well-established criterion for budget decisions, and interpreters are increasingly required to defend their programs on the basis of figures of attendance. Evaluations of this type are an obvious application of program monitoring, though as Ham (1986) thought, attendance figures alone may be a misleading criterion for interpretive evaluations.

Another application of program monitoring is determining whether the visitors who participate in interpretive services are the kinds of visitors the program was intended to attract. For example, a growing body of evidence indicates that participants in interpretive services may represent a select, sophisticated segment of the user population. Compared to nonparticipants, they are often more highly educated, more used to going to parks, more knowledgeable about park activities, and more experienced at attending interpretive events (Ham, 1986). As Lewis (1983) contended, such audiences may not represent the visitors many interpretive programs were designed to serve. Periodically monitoring audience characteristics may help to determine whether this is true, and if so, may suggest program changes or publicity efforts to attract greater proportions of the target audience. Similarly, process evaluation of program content, media, scheduling, and geographical distribution can indicate whether the program has been implemented as intended. Procedures to this kind of monitoring have been developed by California Department of Parks and Recreation (2006).

### **2.2.3 Outcome Evaluation**

Outcome evaluation helps determine the overall effects or outcomes of the program in relation to program objectives. This method may indicate whether the program objectives were met, and also includes any recommendations for improvement. Outcomes evaluation can help to:

- Demonstrate program effectiveness
- Evaluate instruction
- Understand the impact of program changes

- Assess service and make changes
- Advise interpreters with a set of learning outcomes (McNamara, 2008)

For the outcomes-based evaluation in a Geopark, visitor learning outcome which is expected visitor to know, think, and be able to do by the end of designated time as a result of their educational experiences are the focus of evaluation. It is a continual process, not a one-time evaluation and it should be implemented holistically.

For interpretation, outcome evaluation includes the evaluation of change of the knowledge, attitudes and behaviors by interpretation, and the cost-benefit evaluation etc. Through the literature review, the overall empirical research of an evaluation of the effects of interpretation on knowledge, attitudes and behavior change are likely to suffer inconsistencies and inefficiencies in relation to different management issues and different tourism settings (Orams, 1997). Some studies have found that interpretation has a significant impact on increasing visitors' knowledge and promoting favorable attitudes toward the environment or management policies, which in turn lead to their willingness to engage in low-impact behavior. Thus, it was assumed that the positive link of knowledge, beliefs, attitudes and intention may modify inappropriate on-site behavior or promote long-term conservation behavior (Howard, 2000; Moscardo & Woods, 1998). On the other hand, recent researchers found only modest levels of effect on awareness and behavior and an unclear link between knowledge, attitude, intentions and behavior (Orams, 1997) or leading to no significant improvement in attitudes and behavior ( Chandool, 1997).

Several research studies have suggested that personal interpretation services are more effective than non-personal interpretation services. Jacobson (1988) tested the effectiveness of several interpretive media (interpreters, brochures, and signs) in a Malaysian National Park and suggested that there are significant differences between personal interpretation and non-personal interpretation. Respondents who received guided services showed higher satisfaction levels for their visiting experience. Zeng (2000) assessed the degree of tourists' satisfaction and the association between different tourist attributes and their preferences for interpretation services in a recreation area. Visitors used non-personal interpretation services such as signs, brochures, and a self-guided trail most frequently, but they preferred personal interpretation more.

Chang (1996) compared the visiting experience in an historical site in Taiwan between visitors who use interpretation facilities and those who do not. She concluded that the use of interpretative facilities enhances visitors' visiting experiences and also reinforces their knowledge acquisition at tourist destinations. Because no interpreter service was provided at this destination, the study further recommended that interpreters should be provided in order to enhance visitors' satisfaction.

While it is relatively straightforward to evaluate what visitors think and feel about the on-site interpretation, establishing links with behavioral influences and how the interpretation might be altered to elicit different outcomes is more complicated (Ham, 2007).

#### **2.2.4 Impact Evaluation**

Impact evaluation is the systematic identification of the effects – positive or negative, intended or not – on individual households, institutions, and the environment caused by a



given development activity such as a program or project (The World Bank, 2004). Impact evaluation can help better understand the extent to which activities reach the poor and the magnitude of their effects on people's welfare. Impact evaluations can range from large scale sample surveys in which project populations and control groups are compared before and after, and possibly at several points during program intervention; to small-scale rapid assessment and participatory appraisals where estimates of impact are obtained from combining group interviews, key informants, case studies and available secondary data (The World Bank, 2005).

Outcomes evaluation can help:

- Measuring impacts of an activity and distinguishing these from the influence of other, external factors.
- Helping to clarify whether costs for an activity are justified.
- Informing decisions on whether to expand, modify or eliminate projects, programs or policies.
- Drawing lessons for improving the design and management of future activities (The World Bank, 2004).

Recently, several efforts have been made in assessing the beneficial impacts of interpretation in promoting pro-environmental attitudes and behavior in natural areas (Beaumont, 2001; Kuo, 2002; Moscardo, 1998; Orams, 1997). However, the overall empirical research of an evaluation of the effects of interpretation on knowledge, attitudes and behavior change are likely to suffer inconsistencies and inefficiencies in relation to different management issues and different tourism settings (Orams, 1997; Roggenbuck, 1992). Some studies have found that interpretation has a significant impact

on increasing visitors' knowledge and promoting favorable attitudes toward the environment or management policies, which in turn lead to their willingness to engage in low-impact behavior. Thus, it was assumed that the positive link of knowledge, beliefs, attitudes and intention may modify inappropriate on-site behavior or promote long-term conservation behavior (Howard, 2000; Moscardo & Woods, 1998). On the other hand, recent researchers found only modest levels of effect on awareness and behavior and an unclear link between knowledge, attitude, intentions and behavior (Beaumont, 2001; Orams, 1997) or leading to no significant improvement in attitudes and behavior (Chandool, 1997).

As an interpreter could assess the impact of a service or program by measuring actual accomplishments and comparing them to intended performance levels as stated in the objectives. For example, if an objective of an interpretive service was to increase audience knowledge of raptors by ten percent and to reduce audience littering by fifty percent, before and after measurements of both knowledge and littering would provide an indication of whether the service was having its intended impact on the target audience (Ham, 2002).

Besides intended outcomes, impact assessments may also reveal outcomes that were not intended. In interpretation, these could be "extra benefits", such as good press or letters of praise from visitors to administrators. Unintended outcomes could also be undesirable, as when teenagers get the idea to put detergent in a geyser after hearing a related anecdote at the previous evening's campfire program, or when visitors complain about too many rules and regulations -information typically acquired through interpretive services (Ham, 2002).

An impact assessment is premature if the program being evaluated has never been implemented as planned (i.e., has not reached the target audience or is not delivering intended services). For this reason, Rossi et al. (1979) see program process evaluation as critical partners to impact evaluation.

### **2.3 Process of Interpretation Evaluation**

According to University of Tasmania (2003), as for a program, there are three key focal points for evaluation:

#### 1. The design stage

Evaluation here can check the soundness and worth of the evaluation plan:

- In its purpose, objectives, questions to pursue, stakeholders considered
- In the methodology chosen and data gathering techniques selected
- In the analysis strategies selected
- In the reporting strategy, format and identified target audiences
- In respect to the management plan for the evaluation.

#### 2. The evaluation

Evaluation can monitor the progress of the project evaluation and provide feedback for remedial or other action. Each phase or step in the evaluation process can be the subject of this (formative type of) evaluation.

#### 3. The completion stage

There will always be room for improvement and the opportunity to learn from experience. Both the outcomes of the evaluation and its processes can be reviewed to inform future practice. Particular foci for evaluation could include:

- Review of the range of, and worth, of the questions posed
- Review of the design and its implementation
- Assessment of the quality and usefulness of the data gathered and data gathering tools used
- Review of the analysis techniques and validity of interpretation
- Review of the reporting regime (frequency, format, contents etc.)
- Review of the evaluation management structure and processes.

Appropriate management decisions concerning interpretation are supported by the important activities carried out during the evaluation process (Sealey, 1986). Evaluation should be the essential part of the process for improving the exhibits and visitor centers. It should be an ongoing process in order to improve the effectiveness of the interpretive program (Uzzell & Ballantyne, 1998).

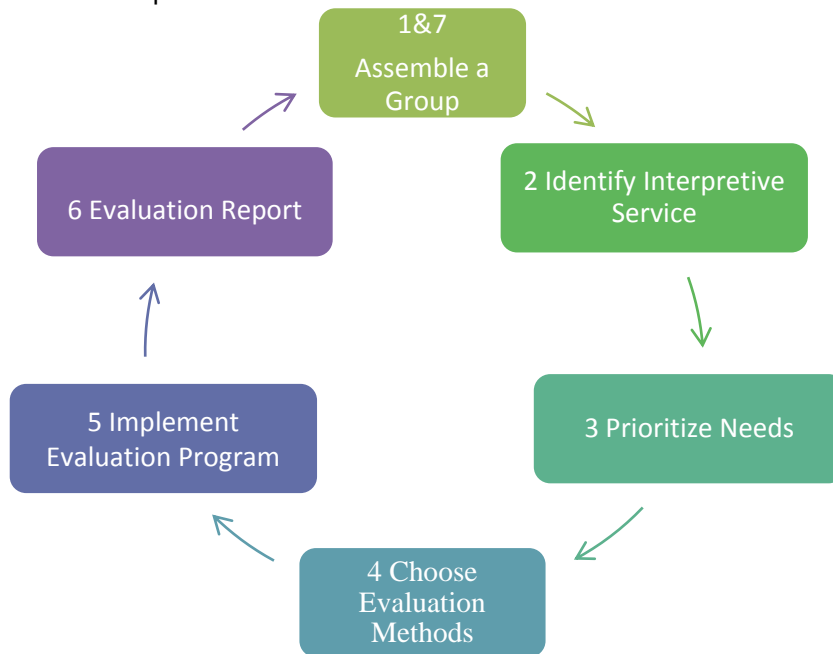
According to California Department of Parks and Recreation (2006), the evaluation process can have seven steps (Figure 2.1).

Step 1: Assemble a group of people to develop the evaluation plan. Staff from a variety of program areas, such as maintenance, public safety, administration, interpretation and the volunteer program should be included to provide a broad perspective. Leads and supervisors of interpretive programs should play a major role in the group process.

Step 2: Identify interpretive services offered to visitors at each park, like campfire programs; guided tours and hikes; talks and demonstrations; audiovisual programs; school programs; environmental living/studies; living history programs; visitor

centers/museums; information stations; self-guided tours/trails; interpretive special programs; exhibits; geological museums; historic structures; publications; websites.

Figure 2.1 Process of Interpretation Evaluation



Step 3: Prioritize needs for improvement. The evaluation methods should be used to prioritize improvement needs and assess visitors’ perceptions of park interpretive programs. Each park can use the survey to gather specific data and assess priorities based upon their own visitors’ needs. Additionally, a simple response card survey may help to identify priorities by focusing on the visitor’s needs. Other priorities, such as critical resource protection, must also be incorporated in the planning process.

Step 4: Choose the appropriate evaluation method(s). The methods should be appropriate for the type of interpretive service, the outcomes the group is interested in measuring, the resources available, and the usefulness and acceptability of the data for field staff. A familiarity with data gathering principles is very beneficial in planning

certain evaluations. After identifying the interpretive programs to be evaluated, the evaluation planner(s) can use the following method:

- Visitor Evaluation
- Expert Evaluation
- Peer Evaluation
- Self Evaluation
- Team Evaluation

Step 5: Schedule and implement the evaluation program. Once a plan is developed, each person who will be participating in the evaluations should be informed. This includes leads and supervisors, interpretive staff (full-time permanent, seasonal and volunteer) and other participants who might be involved in various evaluation projects. Advanced scheduling demonstrates good planning and preparation. It also helps staff make evaluation a priority.

Step 6: Prepare and submit an evaluation report. This report briefly summarizes the recommendations of the evaluation team, highlighting significant data, analysis and improvements that were implemented.

Step 7: Assemble groups every year to assess and revise the evaluation plan for the parks.

## **2.4 Methods of Interpretation Evaluation**

Evaluation may occur at all phases of the interpretive effort---before, during and after the preparation of exhibits and signs, as well as talks, hikes, or special events. Evaluation can combine many approaches, using both qualitative and quantitative research methods (Knudson, 2003).

Qualitative methods which attempt to describe the visitor's opinions, attitudes, perceptions and feelings. This information will require further interpretation and organization. Quantitative methods are research techniques that are used to gather quantitative data - information dealing with numbers and anything that is measurable. Statistics, tables and graphs, are often used to present the results of these methods.

A number of reports on evaluation methods for interpretation exist. One of the earliest was Wagar's (1976) critique of twelve evaluation techniques, including direct measures of behavior, observation of audience feedback, timing of audience viewing/listening time questionnaires, mechanical self-testing devices, time-lapse photography, and other formal and informal measurement procedures. His discussion also included prior applications of these procedures and a review of advantages and disadvantages associated with each. In a separate report on evaluation of an energy exhibition, Wagar, et al. (1976) concluded that the main trade-offs in choosing evaluation methods were precision and cost and proposed that volunteered comments (via a suggestion box) could help identify trends in the effectiveness of exhibits and would cost less than scientific measures such as participant observation, time-lapse photography, and surveys (Ham, 1986).

Veverka (1994) also provided a summary table that listed eleven evaluative techniques, describing the technique, listing their pros and cons, and providing additional comments. The list of techniques included: direct audience feedback, auditing by an expert, direct measures of behavior, observation of audience attention, length of viewing or listening time, questionnaire, interviews, self-testing devices, panel of outsiders, other unobtrusive methods, and a suggestion box (see Table 2.2).

Table 2.2. Visitor Evaluation Techniques

<b>Evaluation Technique</b>	<b>Description</b>	<b>Pros</b>	<b>Cons</b>	<b>Comments</b>
<b>Direct Audience Feedback</b>	Interpreter analyzes visitors' responses in face-to-face settings during the presentation.	Allows for immediate analysis of visitors' reactions. The interpreter can change his/her approach on the spot to elicit a better response.	Technique is subjective since the interpreter must "interpret" the visitors' reactions.	The number of questions asked, facial expressions, restlessness, etc. are often good indicators of enjoyment, boredom, etc.
<b>Auditing by an Expert</b>	Have an experienced interpreter watch and critique an interpretive presentation.	Allows for the input of an experienced professional.	The expert judges how he/she thinks a presentation will affect a visitor. (This is subjective.)	Where live representations cannot be evaluated on site, video tapes can be used.
<b>Direct Measures of Behavior</b>	Determine what Interpretive service options visitors take when given a choice (e.g., hike vs. movie).	Allows for determination of which services are most preferred.	Can determine what services visitors prefer but not why .	Usually determined by head counts, ticket stubs, etc. Additional techniques could be used to determine why visitors had certain preferences.
<b>Observation of Audience Attention</b>	Plant scanners in the audience to watch and document how many people are focusing their eyes on the interpreter.	Allows for the determination of visitor responses during a presentation.	Assumes that watching the interpreter is synonymous with interest, understanding, enjoyment, etc.	Scanners should be trained in what to look for and how to be inconspicuous.
<b>Length of Viewing or Listening Time</b>	Compare the amount of time people look at or listen to a presentation with the amount of time it would take to completely read or hear it.	Allows for the determination of whether or not people are spending enough time with an exhibit, sign, etc. to absorb the entire message.	Cannot determine Visitor enjoyment, understanding, or interest. Thus, no judgment can be made as to whether or not the message is too long.	Studies show visitors look at displays only 15 to 64% of the time required to read or listen to the total message. The longer the printed message, the shorter the viewing time.
<b>Self-Testing Devices</b>	Mechanical devices are operated by visitors to answer Questions or uncover more interpretive information.	Allows for active participation. A "fun" evaluation technique from the visitors' point of view.	Subject to mechanical breakdowns and vandalism. Often monopolized by children.	May be adapted for use on a web site.
<b>Interviews and Informal Groups</b>	An orally administered survey of visitors to determine demographic and experiential data.	A great deal of visitor information can be obtained using well designed questions. Many people are more willing to communicate orally than in writing.	Questions must be designed objectively to avoid bias. They can be time consuming to design, administer and evaluate.	Interviewers should be sensitive to how they may impact the visitor's experience.
<b>Suggestion Box</b>	A locked box where visitors can drop any comments or suggestions.	Anonymity and very simple implementation.	Usually comments are biased towards a positive or negative extreme.	Boxes can be decorated to reflect the site's resources.

(Veverka, 1994, p. 84-86).



Knudson (2003) recognized that evaluation need not be done only by a supervisor and that there is value to using multiple approaches: “The agents of evaluations include supervisors, peers or outside experts, self-evaluation, and audiences responses. . . . Each has advantages and problems, so combining them makes a complete package to improve the interpretive effectiveness” (p. 370).

Morfoot and Blake's (1979) analyzed evaluation methods and criteria for personal and non-personal interpretive services. They concluded that past evaluation methods have been useful but limited in scientific validity, and recommended that single-criterion measures of effectiveness be replaced with multiple measures. Drawing upon advances in multitrait-multimethod measurement, Morfoot and Blake (1979) reasoned that if several measures of the same evaluative criterion (e.g. audience interest) provided the same evidence about the effectiveness of a service, decision-makers could have greater confidence in the findings, and hence in their ultimate judgments about the effectiveness of that service (Ham, 1986). Similarly, Callecod and Gallop (1980) reviewed several evaluation methods, including interviews, mail questionnaires, and unobtrusive measures, according to their ability to provide useful information about interpretive services.

Propst and Roggenbuck (1981) have offered a comprehensive critique of thirteen separate data collection procedures for evaluating interpretive services. They rated each of the methods according to seven criteria:

1. Speed of feedback,
2. Cost,
3. Burden on visitors,
4. Burden on staff,

5. Resistance to bias,
6. Overall usefulness, and
7. General limitations.

Conclusions they drew about the precision and costs of several evaluation methods are summarized in Table 2.3. Generally, the more precise and resistant to bias the data, the more costly the technique(s) needed to collect them; often such costs will be related to the amount of staff time required to administer or conduct the procedure. Their analysis, in basic agreement with those by Wagar (1976), revealed that:

1. Precision is costly and is generally sacrificed when inexpensive evaluation methods are employed, and
2. The best evaluations are those which rely on more than one data collection method since the strengths of one method can often compensate for the weaknesses of another.

In order to achieve the assumed impact, parks may use a range of interpretive media and techniques. Some interpretive media may be described as having more intensity than others where more intense interpretation supposedly has a greater probability of influencing the visitor. For example, interpersonal interpretation is usually ascribed as having greater intensity (and thus influence) than non-personal interpretation (Hughes & Morrison Saunders, 2005). Wearing and Neil (1999) noted interpersonal communication can respond to changing contexts, diverse audience needs and spontaneous events and so can potentially exert more influence on the visitor. Interpersonal interpretation allows a dynamic two way interaction between the management representative and the visitor. However, given the costs, such as training and wages, interpersonal interpretive programs can be relatively expensive.

Table 2.3 Summary Regarding the Precision and Expense of Selected Evaluation Methods for Interpretation.

<b>Method</b>	<b>Precision/ Resistance to Bias</b>	<b>Cost/Burden on Staff</b>
1. Review by peers, experts or outsiders representative of the target audience	Low to Moderate	Low to Moderate
2. Observation of behavior traces (e.g., litter left on a trail, nose prints on exhibit glass, etc.)	Moderate	Moderate
3. Self-testing devices (e.g., recording quiz boards, interactive computers, etc.)	Moderate	Moderate
4. Observation of audience behavior during activities (attention, listening and viewing time, etc.)	Moderate to Good	Low to Moderate
5. Questionnaires (i.e., written self-reports of visitor enjoyment, teaming or behavior)	Good to High	Moderate to High
6. Formal and informal interviews (i.e., verbal self-reports of visitor enjoyment, learning, or behavior)	Moderate (informal) to High (formal)	High
7. Observation of audience behavior after activities (i.e., behavioral responses)	High	High

Propst and Roggenbuck (1981, cited in Ham, 1986)

In contrast, non-personal interpretation is essentially static in terms of having little or no scope to adapt to immediate and changing contexts and visitor needs. The visitor is required to extract meaning from non-personal media in what is effectively a one-way interaction. Non-personal media may thus be considered less likely to influence visitors given the lower intensity of interaction but presents a less costly method of communication over the life of an interpretive program (Hughes, 2004). Parks must thus balance cost of interpretive media with the perceived effectiveness and likely influence on visitors (Munro et al., 2008).

## 2.5 Kinds of Evaluation Criteria

One of the important steps toward interpretation evaluation is to define appropriate criteria since decisions about the future of a program will be linked directly to the criteria used to judge its worth. At the most general level, criteria chosen should reflect program objectives deemed important by decision-makers and by policy governing the program (Ham, 1986). According to Attkisson and Hargreaves (1978):

The primary consideration is that one include the dimensions of outcome felt to be important by the decision-makers who are the intended consumers of the study's findings, it is also important that the measurement approach be adequate to detect an effect that has some practical importance (p. 331).

Perhaps inadvertently, Attkisson and Hargreaves (1978) suggest that “the dimensions of outcome” important to decision-makers may not always be of practical significance to program administrators. However, as Putney and Wagar (1973) have argued, if program objectives are written in concert with policy-level directives, evaluative criteria will more likely be relevant both to decision-makers and to those responsible for implementing the program (Ham, 1986).

Beyond the basic need to be relevant to the decision-making process, evaluative criteria can be further classified according to the kinds of indicators they produce and the kinds of inferences about program inputs and output they permit. Suchman (1967) offered what has since been recognized as the seminal classification scheme for program evaluation criteria. According to his scheme (Table 2.4), evaluation criteria can focus on inputs (staff, money, effort), outputs (program impacts and benefits), or a combination of input and output factors (e.g., the relationships of outputs to social needs, the cost-

effectiveness of program efforts, or the relationship of a program's impacts to the effort put into the program) (Ham, 1986).

Organized into what Suchman (1967) has termed “evaluative domains,” criteria for program evaluations (see Table 2.4) can be classified as :

1. Effort — measurements of the amount and distribution of program effort or input,
2. Performance — measurements of program outputs or impacts on target audiences
3. Adequacy — measurements of program, impacts in relation to perceived needs or demand,
4. Efficiency — measurements of program impacts per unit cost, and
5. Process — measurements of the relative impacts of different kinds; degrees of effort (Ham, 1986).

Table 2.4 Evaluation Criteria (Suchman, 1967)

<b>Evaluative Domain</b>	<b>Type of valuation</b>	<b>Example Applications to Evaluating Interpretation</b>
1. Effort (input)	Program monitoring	Determining numbers of visitors reached, number of staff involved, pertinence of program to policy or guiding legislation, number of services over time and space (Machlis et al, 1983; Ham et al, 1984).
2. Performance (output)	Impact assessment	Determining whether audiences exhibit desired responses in learning, feelings, or behavior (e.g., Young & McDonough, 1985; Hammitt, 1985).
3. Adequacy (output ÷ need)	Program monitoring/ impact assessment	Determining whether current program effort is sufficient to meet perceived needs, whether scheduling matches visitor availability to attend, whether enough services focus on important topics, whether current size of program is sufficient to achieve desired effect on visitor population (Szwak, 1984).
4. Efficiency (output ÷	Economic efficiency	Determining whether program attendance justifies expenditures, whether program impacts justify expenditures, whether some types of services (e.g. self-guided) are more efficient than others (e.g.

input)		conducted) in terms of attendance or impact per unit cost (Wagar, 1976; Knudson & Morfoot, 1979).
5. Process (outcome = effort)	Impact assessment	Comparing immediate and long-range impacts of various interpretive methods (e.g. media, topics, schedule, format, etc.) to determine which has greatest impacts and what the causal relationships are between kind and degree of effort and accomplish- merit of program objectives (Tai, 1981; Feldman, 1975)

According to Roggenbuck and Propst (1981), criteria for evaluating interpretive programs should focus on the message (accuracy, length, grammar, and audience appeal), interpreter performance (organization, attitude, and communication skill), and audience response (attention, retention of information, changed attitudes and behavior, and resource appreciation). As a management tool, the ultimate assumed benefit of interpretation, beyond influencing beliefs, knowledge, attitudes and behavior, is the reduction of visitor impacts on the site (Moscardo, 1998). This rests upon the assumption that interpretation will be successful in influencing visitors to the extent that it translates into an immediate on-site behavioral response (Howard, 2000). Research suggests there is a link between interpretation and behavioral influence based on the extent to which visitors identify with the interpretation material and are provoked to think along the themes presented; this in turn may influence beliefs, attitudes and ultimately behavior (Ham, 2007). So the changes in beliefs, knowledge, attitudes and behavior are the important criteria for judging the effectiveness of interpretation.

Emphasis placed by these writers on performance criteria (Suchman, 1967) and impact assessment (Wu, 2002) seems to reflect the general interest of the interpretive profession as a whole. A nominal group study conducted at the 1985 national workshop of the Association of Interpretive Naturalists (Ham, 1986) revealed that interpreters' most important criteria for evaluating interpretive services in the National Park Service were:

1. Understanding of the resource (knowledge),
2. Visitor appreciation of the resource (feelings), and
3. Interpretation's role as a management tool (stressing visitor behavior).

Part Three of Applicant's Self-Evaluation Form for National Geoparks seeking assistance of UNESCO to become a member of the Global Network of National Geoparks describes the criteria of interpretation and environmental education for national Geoparks and it includes the following main points ( UNESCO, 2008).

1. Research information and education scientific activity within the territory.
2. Are programs of environmental education operated in your applicant area?
3. What kind of educational materials exist?
4. What kind of published information is available in your applicant area?
5. What kind of professional marketing of the area takes place?
6. In how many languages is the marketing material produced?
7. Geology provision for school group ( e.g. organized visits etc).
8. Education Guides
9. What kind of information do you provide to educational groups, which encourage them to visit your area?
10. Do you use the internet for school programs? What kind of service do you provide?

## **Conclusion**

The purpose of this chapter was to review the literature concerning evaluation of interpretation in parks, museums, forests, and other leisure settings. It began by presenting the purpose of interpretation evaluation. The remainder of the chapter focused on the different kinds of interpretation evaluation, process, methods and criteria of

interpretation evaluation.

The literature review shows some major points about interpretation evaluation. First of all, evaluation does not necessarily mean impact evaluation, the formative evaluation, process evaluation and outcome evaluation also can be applied to environmental interpretation programs. Secondly, routine evaluation of environmental interpretation is widely accepted, but the systematic evaluation should be attached more attention.

Process of Interpretation Evaluation includes seven steps and they are: step 1: assemble a group of people to develop the evaluation plan; step 2: identify interpretive services; step 3: prioritize needs for improvement; step 4: choose the appropriate evaluation method(s); step 5: schedule and implement the evaluation program; step 6: prepare and submit an evaluation report; step 7: assemble groups every year to assess and revise the evaluation plan for the parks.

The methods of interpretation evaluation are the major section of the literature review. Evaluation can combine many approaches, using both qualitative and quantitative research methods. The pros and cons of the different evaluation techniques were compared. Finally, criteria of interpretation evaluation were reviewed and applications of these criteria to evaluating interpretive services were described. Evaluation criteria can focus on inputs (staff, money and effort) and outputs (program impacts and benefits), or a combination of input and output factors. Criteria for interpretation evaluations can be classified into effort, performance, adequacy, efficiency and process. From the literature review, we seldom see the systematic and comprehensive environmental interpretation evaluation available and this makes the study more meaningful both theoretically and practically.



## **Chapter 3 Methodology**

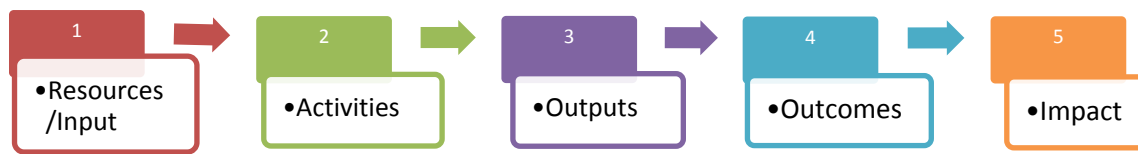
An underpinning of all evaluation is the need for objectives. However in the absence of specific objectives there is a need for a process to identify what the objectives of a program are in order to understand the effectiveness of the program. In this research, in the absence of education objectives when the data was gathered, a “logic model” is being applied to clarify the objectives of Yuntainshan Geopark regarding environmental interpretation.

### **3.1 Logic Model**

Generally, a logic model is a systematic and visual way to identify and understand the relationships among the resources that are available in a program, the activities planned, and the changes or results that the program hopes to achieve. The most basic logic model is a picture of how one believes the program will work. It uses words and/or pictures to describe the sequence of activities thought to bring about change and how these activities are linked to the results the program is expected to achieve (Kellogg Foundation, 2004).

The basic logic model components include resources/input, activities, outputs, outcomes and impact (Figure 3.1). These components illustrate the connection between the planned work and the intended results. The planned work (resources/input and activities) describes what resources are needed to implement the program. The intended results (outputs, outcomes, and impact) explain what you want to achieve. They are depicted numerically by steps 1 through 5 in Figure 3.1 (Kellogg Foundation, 2004).

Figure 3.1. The Basic Logic Model



1. Resources include the human, financial, organizational, and community resources a program has available to direct toward doing the work. Sometimes this component is referred to as inputs.

2. Program Activities are what the program does with the resources. Activities are the processes, tools, events, technology, and actions that are an intentional part of the program implementation. These interventions are used to bring about the intended program changes or results.

3. Outputs are the direct products of program activities and may include types, levels and targets of services to be delivered by the program.

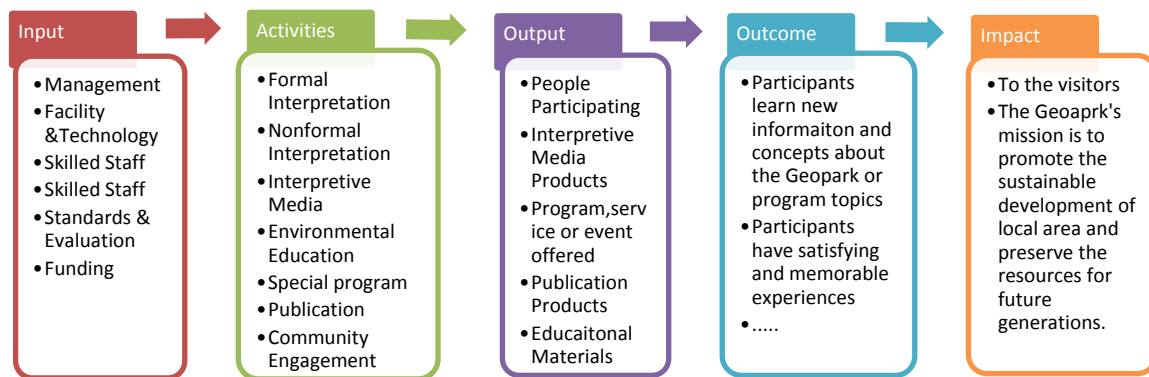
4. Outcomes are the specific changes in program participants' behavior, knowledge, skills, status and level of functioning. Short-term outcomes should be attainable within 1 to 3 years, while longer-term outcomes should be achievable within a 4 to 6 year timeframe. The logical progression from short-term to long-term outcomes should be reflected in impact occurring within about 7 to 10 years.

5. Impact is the fundamental intended or unintended change occurring in organizations, communities or systems as a result of program activities within 7 to 10 years. In some evaluation logic models, impact often occurs after the conclusion of a program.

The term logic model is frequently used interchangeably with the term program theory in the evaluation field. Logic models can alternatively be referred to as theory because they describe how a program works and to what end (Kellogg Foundation, 2004).

In China, Geoparks did not have a logic model that described the environmental interpretation at the national level. According to the characteristics and standards of Geoparks, the study will create an initial draft Geopark environmental interpretation logic model in which the full array of Geopark interpretation programs are considered as a comprehensive program. Figure 3.2 shows the simple version of the logic model for environmental interpretation in Geoparks.

Figure 3.2 Interpretation Logic Model



### 3.2 Site Selection

China set up 11 national Geoparks for the first time in the year 2000, under the guidance of the UNESCO Earth Science Division, and hence has become one of the pioneers in the establishment of Geoparks. China has established 138 national Geoparks and 21 of them are the members of Global Geopark Network (Zhao Xun & Zhao Ting, 2007). Among 138 national Geoparks in China, Yuntaishan Geopark became a member

of the Global Geopark Network in 2003. This made Yuntaishan one of the first Geoparks in the Global Geopark Network. Yuntaishan Geopark is located north of Jiaozuo City, in the southern foothills of Taihangshan Mountains in China. With a total area of approximately 556 square kilometers, the Geopark is characterized by its rifting tectonics, and spectacular landscapes formed by hydrodynamic processes, in combination with its natural ecologic and cultural relic scenery (Ye Zhaohe, 2004).

Yuntaishan Geopark consists of a series of geological formations that have their unique scientific significance and aesthetic values that make the site one of the world's most precious gifts. Under the grand control of a rifting system, the Yuntai Landform represents the typical geological heritage of the neotectonic movement taking place some 23 million years ago. On the stable North China Continental Nucleus, a sequence of continental sedimentary rocks is developed as the record of epicontinental sedimentation from Middle Proterozoic the Paleozoic Era. The unique topographic landforms of the Mount Yuntaishan Geopark have combined the grand panorama of the north and the exquisite beauty of the south. The Geopark also serves as a natural reserve for the most northern distribution of macaque monkeys in mainland China (Ye Zhaohe, 2004).

Yuntaishan Geopark is divided into five parts: Yuntaishan, Shennongshan, Qinglongxia, Fenglinxia, and Qingtianhe scenic areas. Tourist attractions within the Geopark include the hanging springs and waterfalls of the Yuntaishan area, the gorges and mountain streams of the Qinglongxia area, the towering rock walls of the Fenglinxia area, the crystal clear waters of the Qingtianhe River, the Dragon Crest Ridge of the Shennongshan Mountain. All of these provide the spectacularly scenic views for tourists to enjoy during their visit to the Mount Yuntaishan Geopark (Ye Zhaohe, 2004).

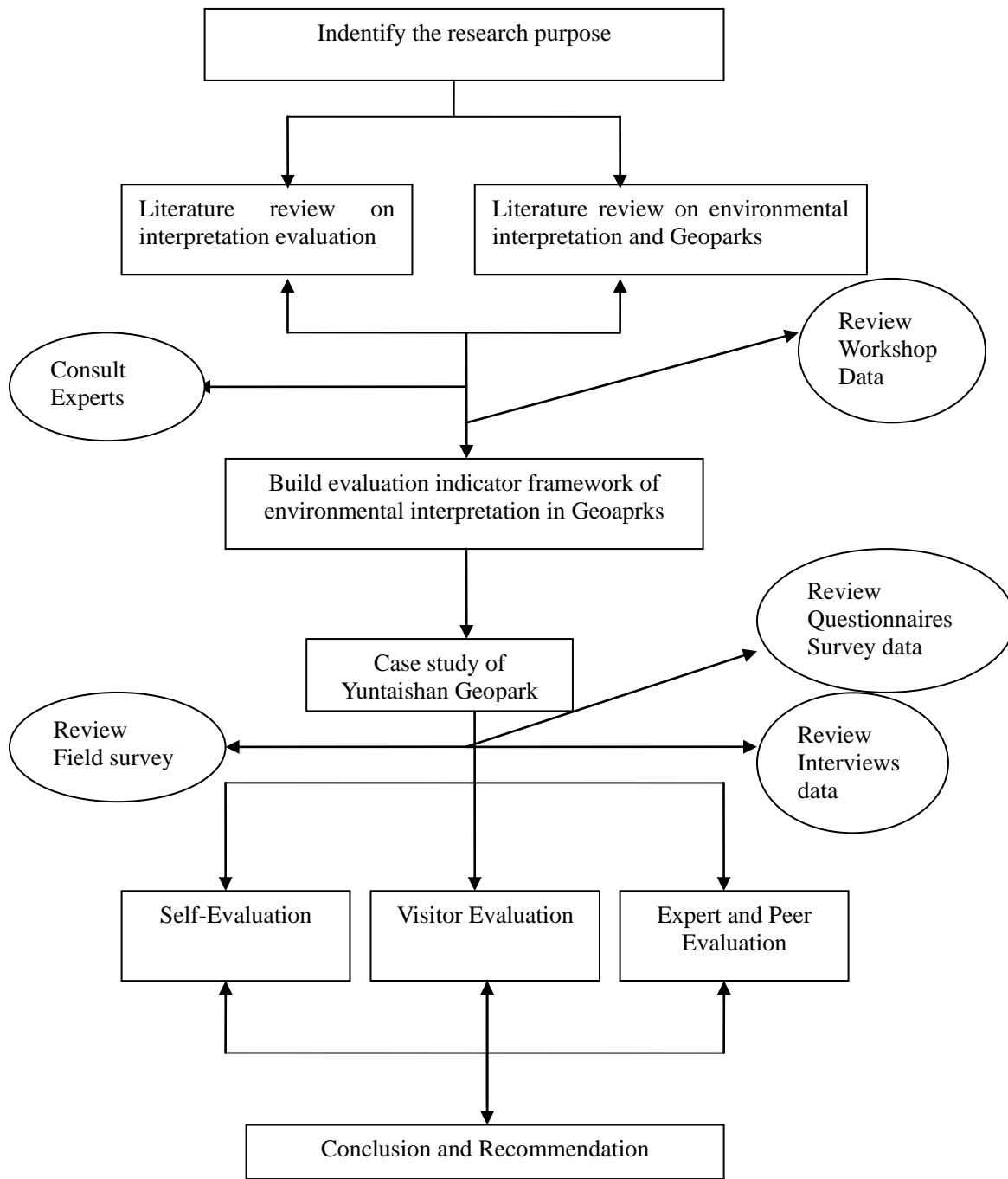
The establishment of Yuntaishan World Geopark has greatly promoted the development of scientific research and local economy. In 2006, the visitor count reached 2.6 million compared to around 100,000 in 2000 (Wei, 2007). It can be said Yuntaishan World Geopark is an excellent representative of Chinese Geoparks. This case study of Yuntaishan Geopark will not only benefit Yuntaishan World Geopark but also other Geoparks in China and even in the world.

### **3.3 Study Procedure**

This study used the following procedure to identify the educational objectives in order to find the effectiveness of environmental interpretation in Geoparks. That procedure (Figure 3.3) is as follows:

1. Find a way to analyze the data because there were no stated educational objectives.
2. After an extensive review of the literature, the researcher came to the conclusion that the “logic model concept” is the best tool to use to identify the objectives.
3. An evaluation indicator framework was built for Geoparks.
4. The field surveys, questionnaires and interviews collected by Yuntaishan World Geopark were analyzed to evaluate the environmental interpretation from the perspectives of the Geopark, visitors, and peer and experts and make analysis.
5. A conclusion was drawn according to the results of the analysis and make the recommendation for the continuous improvement.

Figure 3.3 Procedure of the Study



### 3.4 Case Study Design

In the case study, environmental interpretation of Yuntaishan World Geopark was evaluated from the three aspects: (1) self-evaluation, (2) visitor evaluation and (3) peer and expert evaluation.

- Self-evaluation evaluates the environmental interpretation according to the evaluation indicator framework of environmental interpretation.
- Data from visitor evaluation surveys collected by Yuntaishan Geopark Authority in May, 2007 is used. Six hundred fifty ( 650 ) questionnaires were collected.

This study analyzes these questionnaires using SPSS and EXCEL software.

- For expert and peer evaluation, the researcher makes use of the materials from peer and expert interviews collected by Yuntaishan Geopark staff during the international forum on Geoparks: Interpretation and Sustainable Development.

This forum was held at Yuntaishan World Geopark, Xiuwu County, Henan Province from October, 11-14, 2007.

## **Chapter 4 Building Evaluation Indicator Framework of Environmental Interpretation for a Geopark**

### **4.1 Logic Model of Environmental Interpretation**

An environmental interpretation logic model (later referred to as a “logic model”) is a simple description, in chart form, of how a Geopark’s resources and activities are related to the expected outcomes. Understanding the components and logic for interpretive programs and media is critical to determining where, when, why, and how to evaluate. When a program’s resources, activities, and impacts are identified, Geopark managers can begin to determine what is known (for instance, through existing study or other evaluation studies) about the inputs and the impact, and what has yet to be determined.

The logic model “maps” the Geoparks’ understanding of its program’s context, logic, and purposes and can be used for program development, communication, and evaluation. Logic model helps Geoparks concisely view their assets, link their resources to projected outcomes, and establish a common language.

In China, Geoparks did not have a logic model that described the environmental interpretation at the national level. According to the characteristics and standards of Geoparks, this study created an initial draft Geopark environmental interpretation logic model in which the full array of Geopark interpretation programs was considered as a comprehensive program.

The process of developing a model was an opportunity to clarify the underlying assumptions we made about the outcomes, to figure out how various activities and outcomes relate to one another, and how the model may be most useful to all stakeholders. The resulting logic model describes the resources, activities, and intended outcomes for

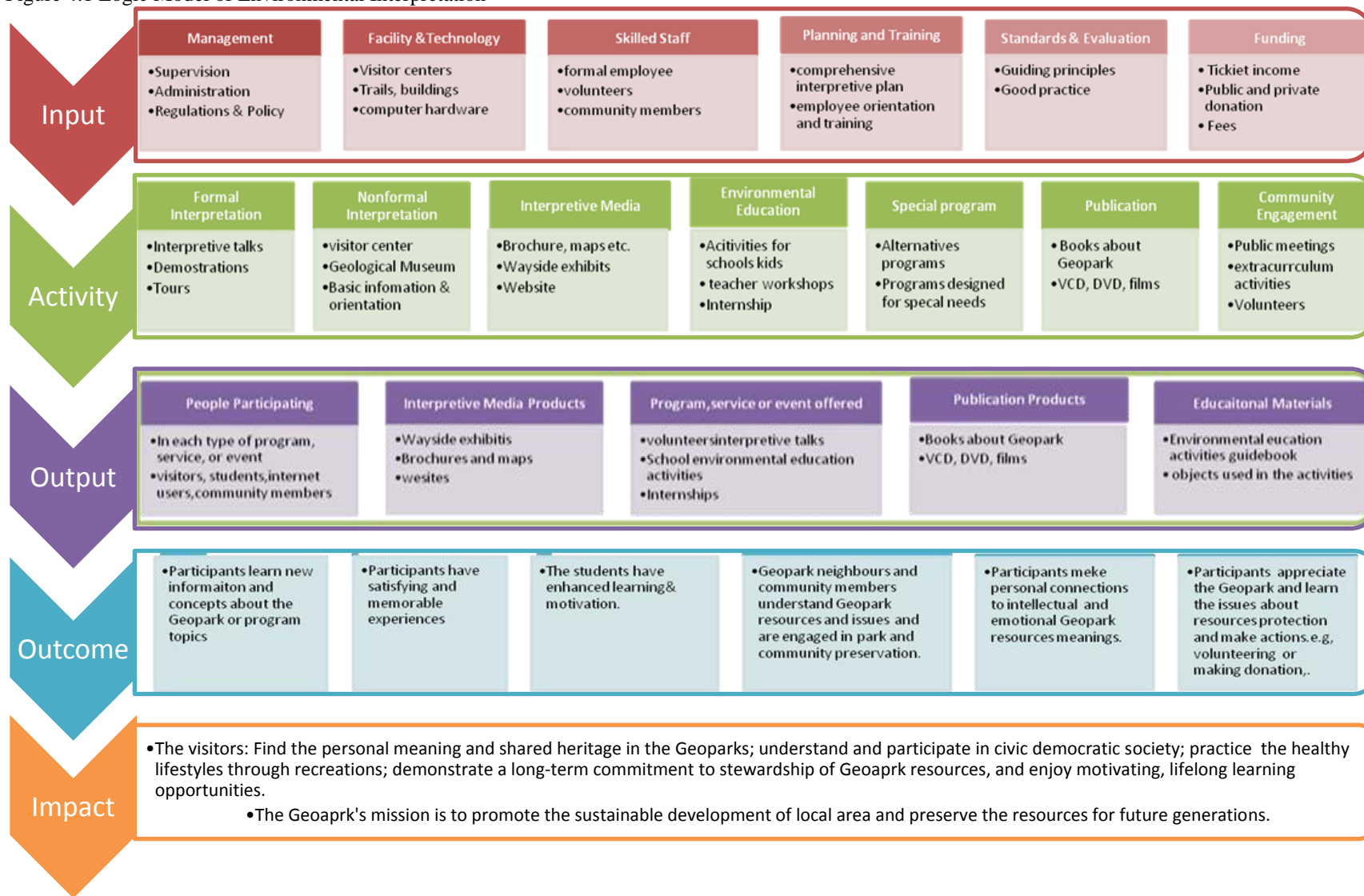


Geopark interpretation, ultimately, their impact in support of the mission. The model encompasses the broad range of interpretive activities typically presented in Geoparks.

The model will help guide the evaluation framework of environmental interpretation in Geoparks. As a framework in which all levels of interpretive activities can see themselves, the logic model will help shape the way we connect, communicate, represent the programs, and structure the thinking about program planning and implementation. Equally importantly, the model assists Geoparks staff in the endeavors to assess long-term outcomes and their relationship to the mission and goals. A one-page summary, environmental interpretation logic model can be found in Figure 4.1.

We can see from the logic model that the impact is the visitors find the personal meaning and shared heritage in the Geoparks and understand and participate in civic democratic society, and practice the healthy lifestyles through recreations, and demonstrate a long-term commitment to stewardship of Geopark resources, and enjoy motivating, lifelong learning opportunities. For Geoparks, its mission is to promote the sustainable development of local area and preserve the resources for future generations.

Figure 4.1 Logic Model of Environmental Interpretation



## 4.2 Maslow's Hierarchy of Needs Model

Maslow developed the Hierarchy of Needs model that has influenced a number of different fields, including interpretation. His theory suggested that people have a hierarchy of needs or drives. He began with the basic needs—physiological needs such as air, food, water, and sleep. Then, as people meet these survival needs, they move up to more sophisticated and socially oriented needs such as identifying with a group, being accepted and loved. After satisfying these needs of social belongings, a person may escalate to needs for esteem and self-actualization (Figure 4.2) (Future Hi, 2008).

According to Maslow, the basic physiological needs of survival tend to dominate a person's attention as long as they remain unmet. If a person is starving, the drive for food may override the need for social approval or intellectual satisfaction. That does not imply that a hungry person does not have other needs. It just suggests that satisfying acute hunger takes top priority (Future Hi, 2008).

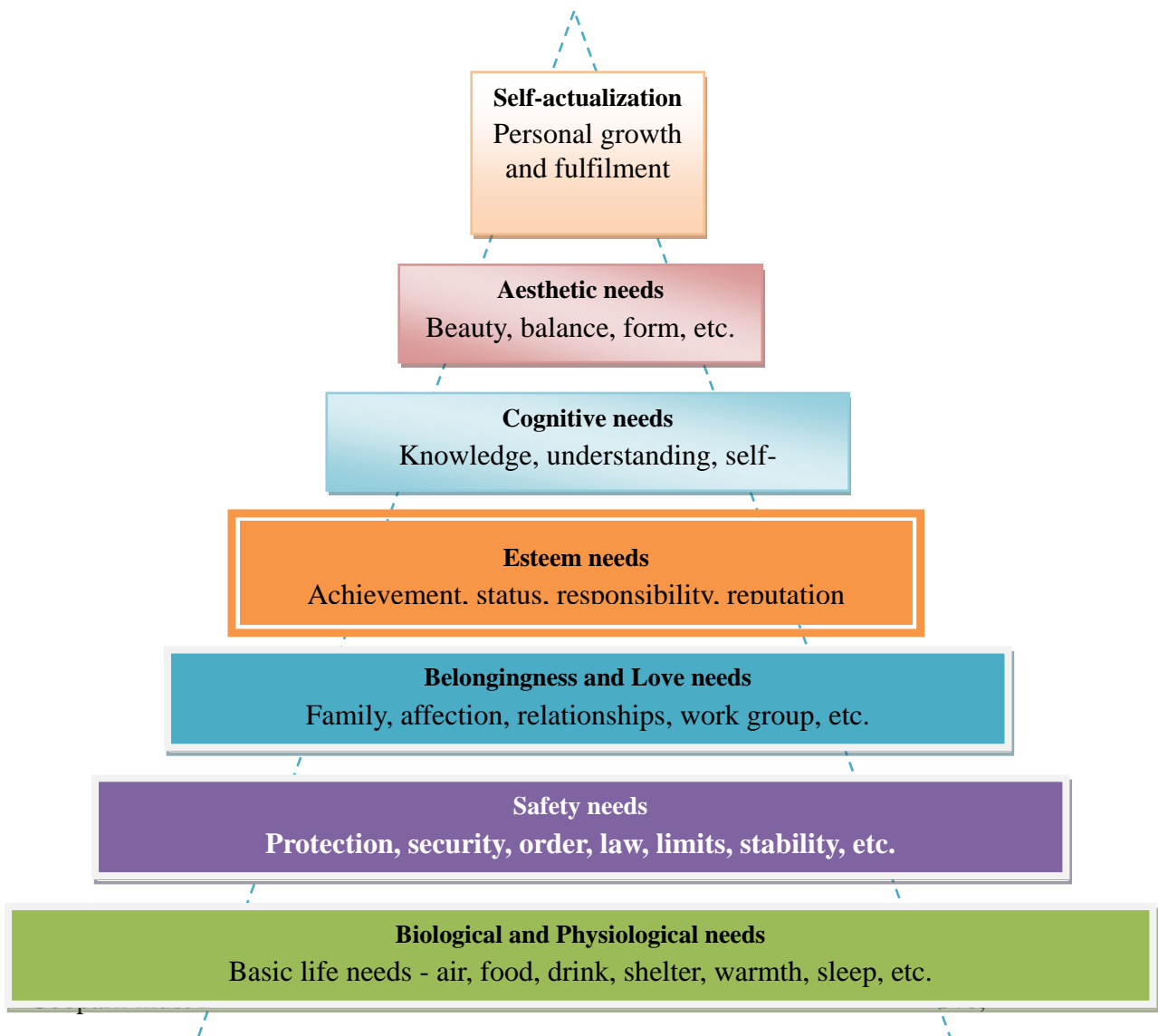
Although the desire for self-actualization is the pinnacle of growth motivation and is universal in people, Maslow thought it difficult to attain because it depends on the lower needs being met. He said only about one person in ten is primarily motivated by self-actualization needs. Most are lower on the hierarchy, being preoccupied by trying to satisfy esteem, love, or security drives. The Table 4.1 presents ways interpretation can meet the needs of visitors regardless of their place in Maslow's theoretical hierarchy (Knudson et al., 1995, p. 55).

Table 4.1 Expanded levels of Visitor Needs and How Interpretation Can Meet Them

Levels of Need	How Interpretation can meet visitor needs
Self-actualization	<ul style="list-style-type: none"> <li>• Help visitors to develop interpretive materials from their own perspectives.</li> <li>• Assist visitors to develop their own campfire programs.</li> <li>• Provide resources for independent exploration and research</li> </ul>
Aesthetic needs	<ul style="list-style-type: none"> <li>• Offer seminars and training with experts related to visitor interests.</li> <li>• Lead guided walks to places of special or unusual aesthetic interest.</li> <li>• Hold art, photo, and writing exhibitions among young and older visitors.</li> <li>• Bring in artists, poets, and musicians to talk to and work with visitors.</li> </ul>
Cognitive needs	<ul style="list-style-type: none"> <li>• Provide for continued study in areas of visitor interest and ability.</li> <li>• Provide access to reports, plans, and budgets; answer inquiries about policy, science, and regulations; post key questions and response for all to see.</li> <li>• Provide interpretive exercise, experiments, activities, and tasks for visitors to pursue on their own time.</li> <li>• Provide access to data and diverse library resources.</li> <li>• Set up time for interpreters and managers to talk with visitors informally about site information.</li> <li>• Arrange for visitors to see practical applications of principles, concepts, and ideas.</li> </ul>
Esteem needs	<ul style="list-style-type: none"> <li>• Recognize visitor achievements on bulletin boards, in park newsletters, and campfire programs.</li> <li>• Give some visitors active roles on walks, at campfires, and during the slide shows.</li> <li>• Avoid punishment and sarcasm; act fairly and consistently.</li> </ul>
Belongingness and Love needs	<ul style="list-style-type: none"> <li>• Call the visitor by name-ask for it and use it.</li> <li>• Make clear your pleasure in working with visitors and with the individual.</li> <li>• Visit the campground and other gathering places to welcome visitors and invite their participation.</li> </ul>
Safety needs	<ul style="list-style-type: none"> <li>• Publish and explain key safety policies and follow them consistently.</li> <li>• Provide consistent safety measures; project firmness and competence.</li> <li>• Have trained first-aid personnel and equipment visibly available.</li> </ul>
Biological and Physiological needs	<ul style="list-style-type: none"> <li>• Check visitors for proper clothing, water, food, and protection at start.</li> <li>• Provide for sanitation needs and a healthy environment.</li> <li>• Announce times, locations, and strenuousness of program activities.</li> </ul>

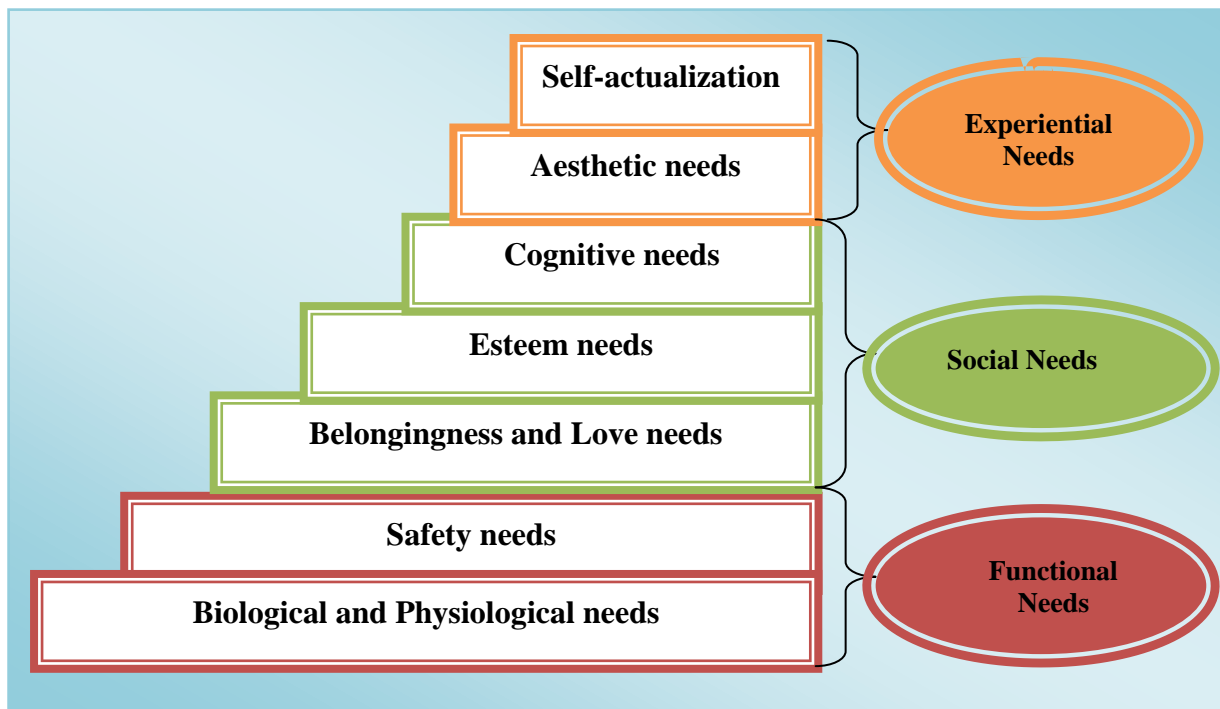
Douglas M.Knudson, Ted T.Cable, Larry Beck(1995). Interpretation of Culture and Natural Resources.. PA.Venture Publishing Inc. P.55.

Figure 4.2 Maslow's Hierarchy of Needs Model



esteem and cognitive needs which are considered social needs, and aesthetic and self-actualization needs which are personal experiential needs. The simple characterization of Maslow's concept is to break the levels into three groups in the field of environmental interpretation (Figure 4.3).

Figure 4.3 Three needs of Environmental Interpretation



#### 1. Functional Needs

- Biological and Physiological needs
- Safety needs

#### 2. Social Needs

- Belongingness and Love needs
- Esteem needs
- Cognitive needs

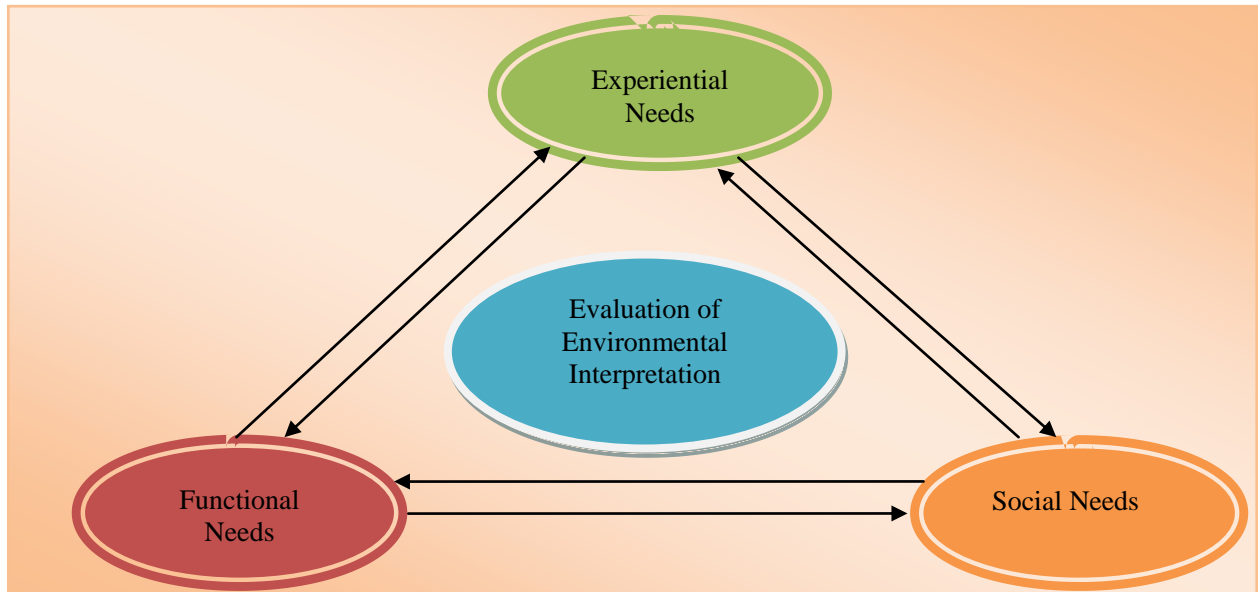
#### 3. Personal experiential needs

- Aesthetic needs
- Self-actualization

From the figure 4.3, three needs of Environmental Interpretation we can see environmental interpretation can meet the functional needs, social needs and experiential needs and the evaluation of environmental interpretation should be done from these three aspects. Figure 4.4 shows the triangle evaluation model of environmental interpretation and these three aspects have mutual influence and

interaction and they cannot be separate.

Figure 4.4 Triangle of Environmental Interpretation Evaluation

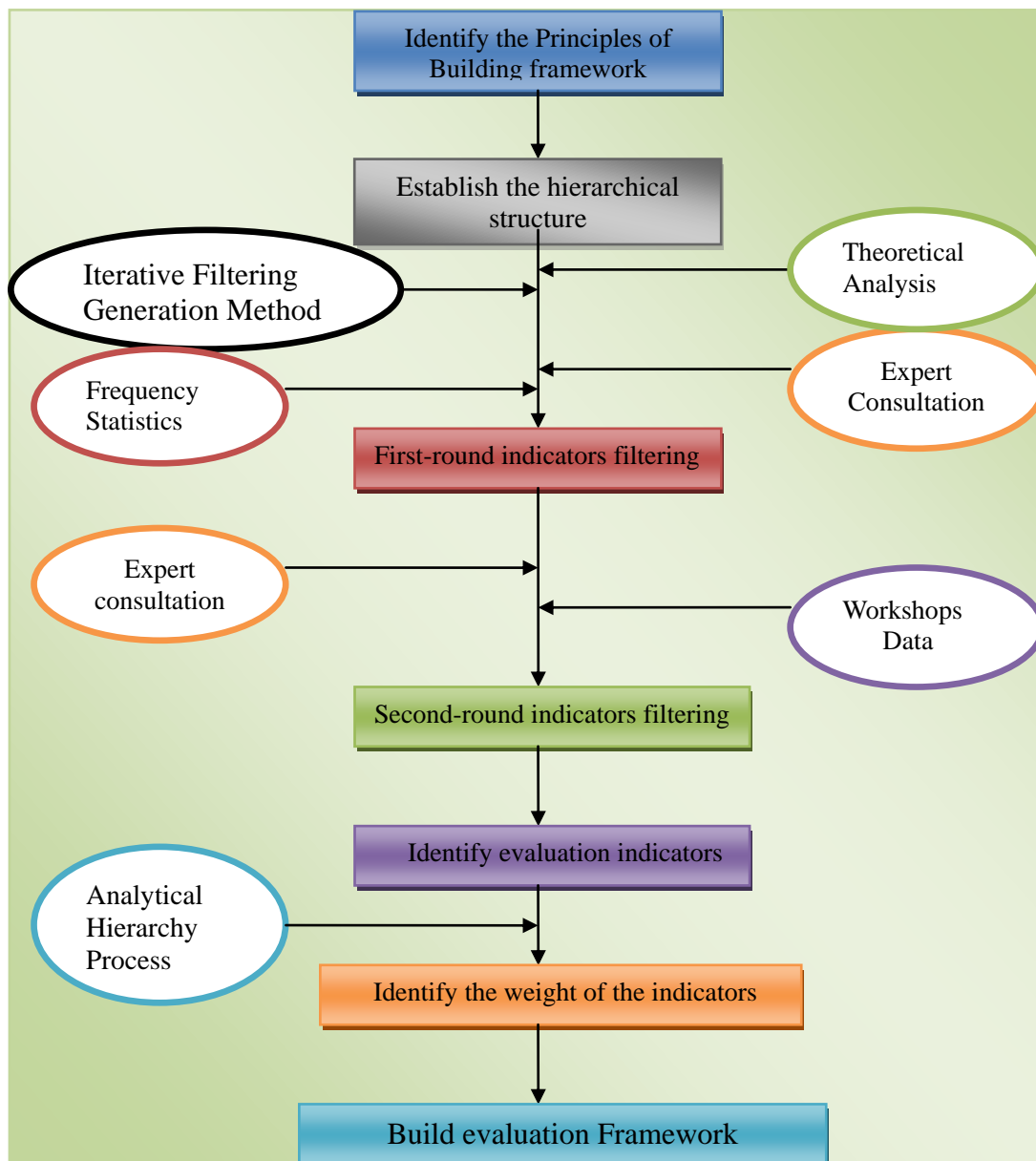


### 4.3 Building Evaluation Framework of Environmental Interpretation for a Geopark

Environmental interpretation is a key tool for integrated management of a Geopark, with potential for greater use in managing visitor numbers, behavior and impacts, and enhancing experience. It is closely associated with a set of more specific indicators that fit under the broad topic of environmental interpretation.

First of all, the study will explain the principles for building the evaluation indicator framework of environmental interpretation and establish the hierarchical structure of the evaluation framework according to the triangle evaluation model of environmental interpretation, and then identify the indicators of the evaluation and take account of their weight through Analytical Hierarchy Process (AHP), thus finally build the evaluation framework of environmental interpretation for a Geopark (Figure 4.5).

Figure 4.5 Procedure of Building Evaluation Indicator Framework.



#### 4.3.1 Principles of building evaluation indicator framework

A Geopark must provide and organize support, tools and activities to communicate geo-scientific knowledge and environmental concepts to the public (e.g. through museums, interpretive and educational centers, trails, guided tours, popular literature and maps, modern communication media). It also allows and fosters scientific research and cooperation with universities, and between geoscientists and the local populace (UNESCO, 2008).

The success of environmental interpretation in a Geopark depends not only on



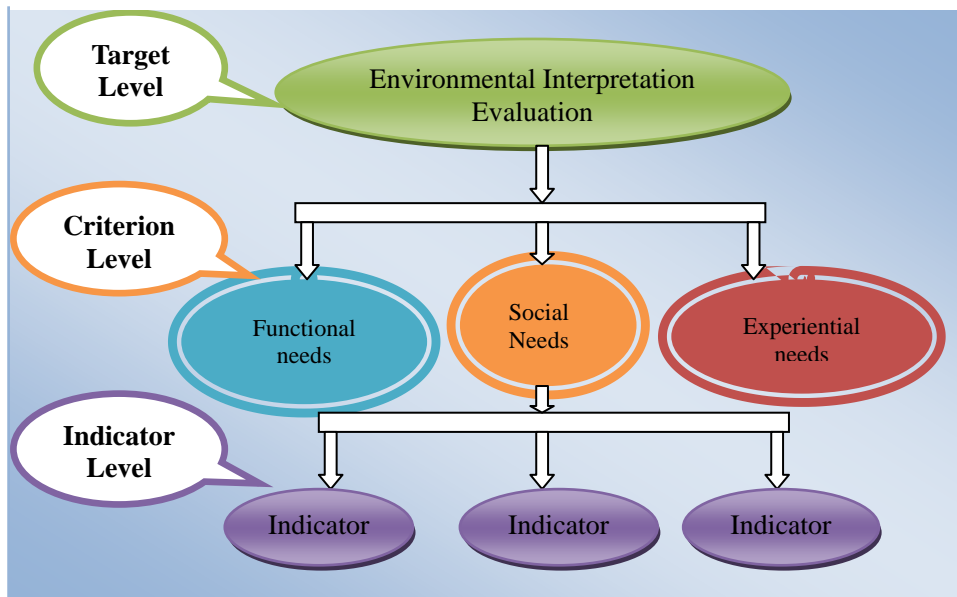
the content of interpretation programs, good interpreters and logistic support for the visitors, but also on the environmental education activities, interactive media and good planning etc. Environmental interpretation is a complicated and comprehensive system and the elements are interrelated and inter-complementary, so the evaluation framework needs many different indicators to present the state of the Geopark. To build the evaluation framework, the following principles need to be observed:

1. The indicators cannot overlap. The indicators in the framework are interrelated; need to present the state of the whole system.
2. The indicators should be practical, and easy to access.
3. Environmental interpretation is a dynamic process and it should be showed in the indicators.
4. The indicators can be used in different Geoparks.

#### **4.3.2 Hierarchical structure of Evaluation Indicator Framework**

The evaluation framework is formed by three levels of hierarchy decomposition. The first level is called the target level, the second is called the criterion level, and the third level is called the indicator level (Figure 4.6). The criterion level is composed of functional needs, social needs and experiential needs and each criterion has several indicators.

Figure 4.6 The Hierarchy of Evaluation Framework



### 4.3.3 Indicator Selection

Effective evaluation needs a scientific and reasonable indicator system. Some scholars put forward the evaluation indicators related to environmental interpretation, but it has the following problems:

1. It lacks of the scientific methods for indicator filtering and mainly depends on the subjective selection.
2. The indicators overlap and it affects the accuracy of the evaluation.

The selection of the indicators has three steps in this study. First of all, according to the literature review on environmental interpretation and interpretation evaluation, the study selects the indicators by frequency statistics; second, the study analyzed the characteristics and main problems of Geoparks, choosing the key indicators from the first step. Third, experts were consulted and indicators were adjusted accordingly and the first-round indicators were formed.

In a workshop on environmental interpretation, 12 graduate students after being introduced to the indicators, brainstormed the importance of the indicators.

Afterwards some of the indicators were revised and combined. After the expert

consultation, the second-round indicators were finalized (Table 4.2).

The study identifies that the evaluation indicators of environmental interpretation in a Geopark has three criteria and they are functional needs, social needs and experiential needs.

### 1. Functional Needs

The criterion of functional needs includes three indicators: visitor center or ticket office, restroom facility, and basic information and consultation. Every indicator has detailed evaluation standards.

### 2. Social Needs

Social needs include environmental protection, environmental education, Geopark publication and personal interpretation. Personal interpretation has three standards which are service attitude, interpretive contents, and interpretive skills.

### 3. Experiential Needs

The criterion of experiential needs includes special programs, multimedia facility and geological museum. One of the standards for the Geological Museum, is to use a variety of interpretation methods, such as audiovisual media, internet, performance, interactive activities etc.

Table 4.2 Evaluation Indicator Framework of Geoparks Environmental Interpretation

Criteria	Indicators	Evaluation Standard
Function-al Needs	Visitor Center (or Ticketing office etc.)	Information center “meeting and starting” point for excursions
		The appearance of the building, grounds, and neighborhood fits with the Geopark theme and its identity
		Deliver the warm welcome(e.g. nice attitude)
		Accessible for wheelchair users and other disabilities
		Offer tourist information at the centre
	Restroom Facility	Clear orientation to restrooms
		Hygiene products available (toilet paper, hand soap etc.)
		Keep clean
		Easy to get maps and information sheets
		Own website with general information about the Geopark

Function-al Needs	Basic Information and Orientation	Offer the information about the safety or other situations may occur in the Geopark	
		Deliver the information about regulations and limitation for visitors	
		Clear orientation panels or signs	
		Interpretation panels along trails are enough and regularly disseminated	
		Warning panel or signs at the dangerous places	
Social Needs	Environmental Protection	Provision for enforcement of regulations (no digging and collection)	
		Use of observation posts, guarding and patrolling by wardens	
		Offering collecting of geological specimens under supervision at selected sites	
		Use of environment friendly facility( e.g clean-running vehicles)	
	Environmental Education	Permanent staff include specialists in environmental education who undertake such work as their main role	
		Personal and individual program offered to children who come to the Geopark with their parents	
		Operate a special program for primary/elementary school classes	
		Operate a special program for secondary/high school classes	
		University camps/education centers for internships	
	Publications	Popular literature for public (e.g. Books, guide books)	
		Natural and cultural and historical elements of the Geopark and its neighboring area	
		Develop the related educational materials for school classes	
		Electronic publications, like film, CD, DVD, etc.	
		Multi-languages publication	
	Personal Interpretation	Service attitude	Well-dressed and behaved
			Positive attitude, appropriate Humor
			Considers and responds to visitors' needs
		Interpretive Content	Relevant
			Accurate
			Understandable
Interpretive Skills		Thematic	
		Provocative/enjoyable	
Experiential Needs	Special programs	Organized	
		Alternatives programs available if tour impossible due to bad weather conditions.	
		Interpretation programs exist for different ages	
	Multimedia Interpretation	Special, scientific programs exist	
		Films, video, slideshow etc.	
		Interactive displays	
		Audio interpretation equipment	
	Access to computers and internet		
	Attractive		

Experiential Needs	Geological Museum	Specific theme or different themes show the logic connection
		Introduce natural characteristics of the Geopark and local area
		Introduce cultural and historical characteristics of the Geopark and local area
		Suitable content for different age groups
		Well-designed exhibition space
		Clear orientation to different themes
		Use of a variety of interpretation methods

#### 4.3.4 Analytic Hierarchy Process

As discussed above, the indicators that influence the evaluation of environmental interpretation are complex, and it is difficult to decide weight of each indicator. To solve the problem, analytic hierarchy process (AHP) is introduced here.

Ever since its development in the 1970's by Saaty, the analytic hierarchy process has found extensive applications in social studies, economics, and in various fields of science and technology. Owing to its capability of dealing with complicated problems, it has potential as an analytic method that works relatively well in arranging and generalizing subjective human judgments and then making high quality objective descriptions.

AHP is a multi-objective, multi-criterion decision making approach which employs a pair-wise comparison procedure to arrive at a scale of preferences among sets of alternatives. To apply this technique, it is necessary to break down a complex unstructured problem into its component parts arraying these parts, or variables, into a hierarchy order; assigning numerical values to subjective judgments on the relative importance of each factor and synthesizing the judgment to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation (Saaty, 1980).

The AHP model in this study has three levels (Figure 4.6), and the line between each level demonstrates the logical relationship of the factors. These factors are named as follows: Criterion Level as Level A and Indicator Level as Level B and

Target Level as Level T, and named functional needs as  $A_1$ , social needs as  $A_2$ ; and experiential needs as  $A_3$  and visitor center as  $B_{11}$  (Figure 4.7, Figure 4.8).

Figure 4.7 The Hierarchy of Evaluation Framework

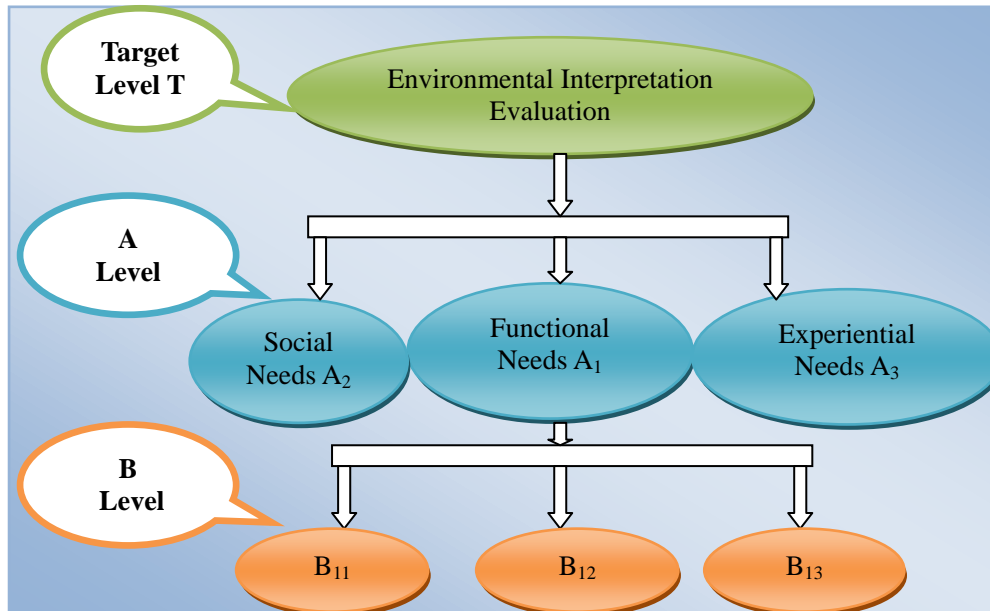
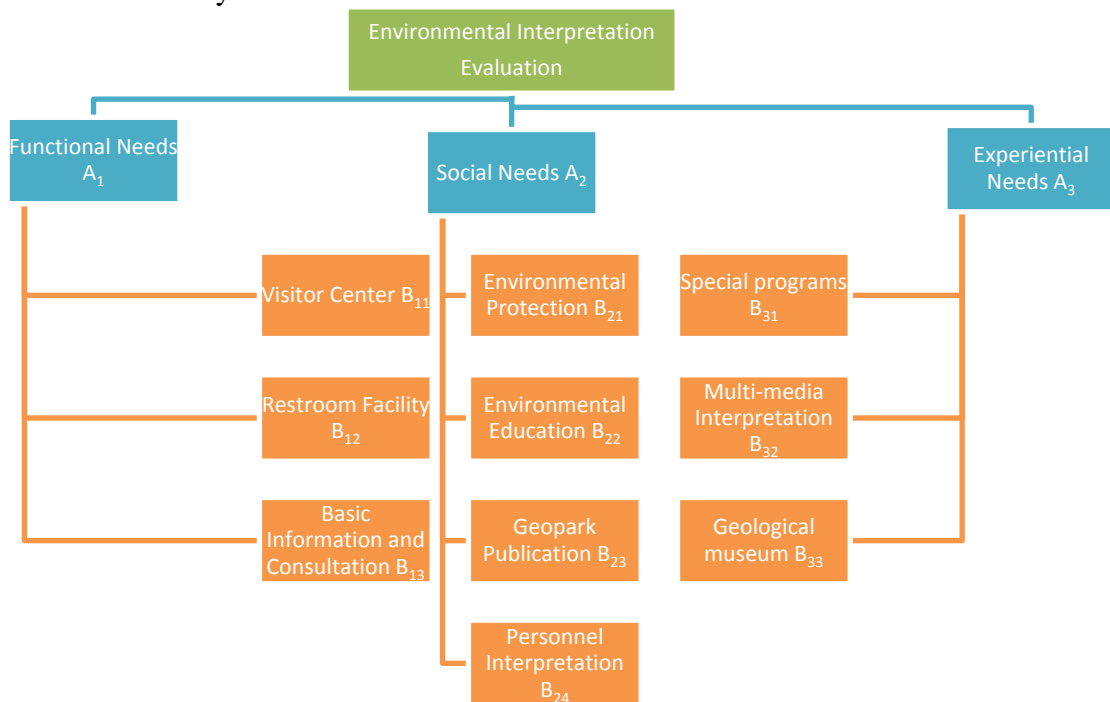


Figure 4.8 The Hierarchy of Evaluation Framework



### 4.3.5 Judge Matrix Generation

In order to judge the importance level of different levels a Judge Matrix has been generated. In order to make the relative importance of factors be quantitative,

the scale of Saaty is introduced. The mean of the scale is shown in Table 4.3 (Saaty, 1980).

Table 4.3 Scale of relative importance

Intensity of Relative importance	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
3	Moderate importance of one over another	Experience and judgment slightly favor one activity over another
5	Essential or strong	Experience and judgment strongly favor one activity over another
7	Demonstrated importance	An activity is strongly favored and its dominated is demonstrated in practice.
9	Absolute importance	The evidence favoring one activity over another is the highest possible order of affirmation.
2,4,6,8	Intermediate values between the two adjacent judgments	When compromise is needed
Reciprocal	If activity i has one of the above non-zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared to i.	

The scale is used to judge the relative importance of factors on each level. If we compare the relative importance of factors of the criterion level to the target level, we derive the judge matrix of the criterion level A to the target level T  $A_{A-T} = (a_{ij})_{3 \times 3}$  as follows:

$$A_{A-T} = (a_{ij})_{3 \times 3} = \begin{bmatrix} 1 & 5 & 7 \\ 1/5 & 1 & 3 \\ 1/7 & 1/3 & 1 \end{bmatrix}$$

Similarly, the judge matrix of the indicator level B<sub>ij</sub> to the criterion level A can be written as following:

$$A_{B-A} = (a_{ij})_{3 \times 3} = \begin{bmatrix} 1 & 8 & 5 \\ 1/8 & 1 & 2 \\ 1/5 & 1/2 & 1 \end{bmatrix}$$

### 4.3.6 Hierarchy single sorting and consistency test

From the judge matrix, the maximum  $\lambda_{\max}$  of the matrix and the corresponding eigenvector  $W$  can be gotten. Make the  $W$  normalize, the weight which the factors of the inferiors level to one of factors of the senior level can be reached, and this process is called hierarchy single sorting. To ensure the Table 4.4 the index RI of average random consistency confidence, the consistency test is necessary, that it to calculate consistency index  $CI = (\lambda_{\max} - n) / (n - 1)$ , where  $m$  is the element number in the judge matrix.

To judge the consistency of different judge matrixes, the index RI of average random consistency of the judge matrixes is introduced. To 1 ~ 9 order judge matrix, RI can be deduced from the Table 4.4.

Table 4.4 Score of RI

N	1	2	3	4	5	6	7	8	9
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45

When the order of the judge matrix is bigger than 2, the ratio of consistency index CI to average random consistency index RI is named CR,  $CR = CI/RI$ . The judge matrix is considered tolerable if  $CR < 0.1$ , and the single sorting is reasonable, in verse, the judge matrix should be modified.

### 4.3.7 Hierarchy general sorting and consistency test

The process to sort weight of all factors of the same level to the target level is called hierarchy general sorting. The process processes from the top level to the lowest one by level. The weight of general sorting can be gotten by table 4.5, where  $b_{ij}$  is the weight. When  $B_i$  has no relation with  $A_j$ ,  $b_{ij} = 0$ . On level B,



$$b_i = \sum_{j=1}^m b_{ij} a_j, i = 1, \dots, n$$

Table 4.5 General Sorting Weight of Level B

B \ A	A <sub>1</sub>	A <sub>2</sub>	....	A <sub>m</sub>	General Sorting Weight of Level B
B	a <sub>1</sub>	a <sub>2</sub>	....	a <sub>m</sub>	
B <sub>1</sub>	b <sub>11</sub>	b <sub>12</sub>		b <sub>1m</sub>	$\sum_{j=1}^m b_{1j} a_j$
B <sub>2</sub>	b <sub>21</sub>	b <sub>22</sub>		b <sub>2m</sub>	$\sum_{j=1}^m b_{2j} a_j$
....	....	....	....	....	⋮
B <sub>n</sub>	b <sub>n1</sub>	b <sub>n2</sub>		b <sub>nm</sub>	$\sum_{j=1}^m b_{nj} a_j$

The study consists of experts providing the value according to their perception of relative importance of each indicator. This generates the judgment matrix used the software MATLAB7.1 to do hierarchy single sorting and hierarchy general sorting to obtain the weight of the factors (Table 4.6 & Table 4.7). This also generates the ratio of consistency index CI to average random consistency index RI is CR < 0.1, so it has satisfactory consistency.

Table 4.6 Hierarchy Weight of Level A

Level T	Relative Priority Weight	Sort order
Level A		
<b>A1</b>	0.2939	2
<b>A2</b>	0.4295	1
<b>A3</b>	0.2766	3

Figure 4.7 Hierarchy Weight of Level B

Level A	Level B			Sort order	
	<i>A1</i>	<i>A2</i>	<i>A3</i>	Priority Order	
Level B	0.2939	0.4295	0.2766		
<i>B<sub>11</sub></i>	0.3114	0	0	0.4473	4
<i>B<sub>12</sub></i>	0.2413	0	0	0.4294	8
<i>B<sub>13</sub></i>	0.4473	0	0	0.3571	1
<i>B<sub>21</sub></i>	0	0.1969	0	0.3114	10
<i>B<sub>22</sub></i>	0	0.2574	0	0.2961	6
<i>B<sub>23</sub></i>	0	0.2496	0	0.2574	7
<i>B<sub>24</sub></i>	0	0.2961	0	0.2496	5
<i>B<sub>31</sub></i>	0	0	0.2135	0.2413	9
<i>B<sub>32</sub></i>	0	0	0.3571	0.2135	3
<i>B<sub>33</sub></i>	0	0	0.4294	0.1969	2

From the sort order of Level A, functional needs of environmental interpretation takes up 43%, and social needs takes up 29%, and experiential needs takes up 28%.

On level B, the weight of visitor center takes up 31%, restroom facility 24%, basic information and consultation 45%; environmental protection 26%, environmental education 26%, Geopark publication 25%, personnel interpretation 30%; special program 21%, multimedia interpretation 36%, geological museum 43%. Indicator value was distributed between standards based on the decision of experts judgment and the researcher's decision (Table 4.8).

Table 4.8 Evaluation Indicator Framework of Environmental Interpretation for a Geopark

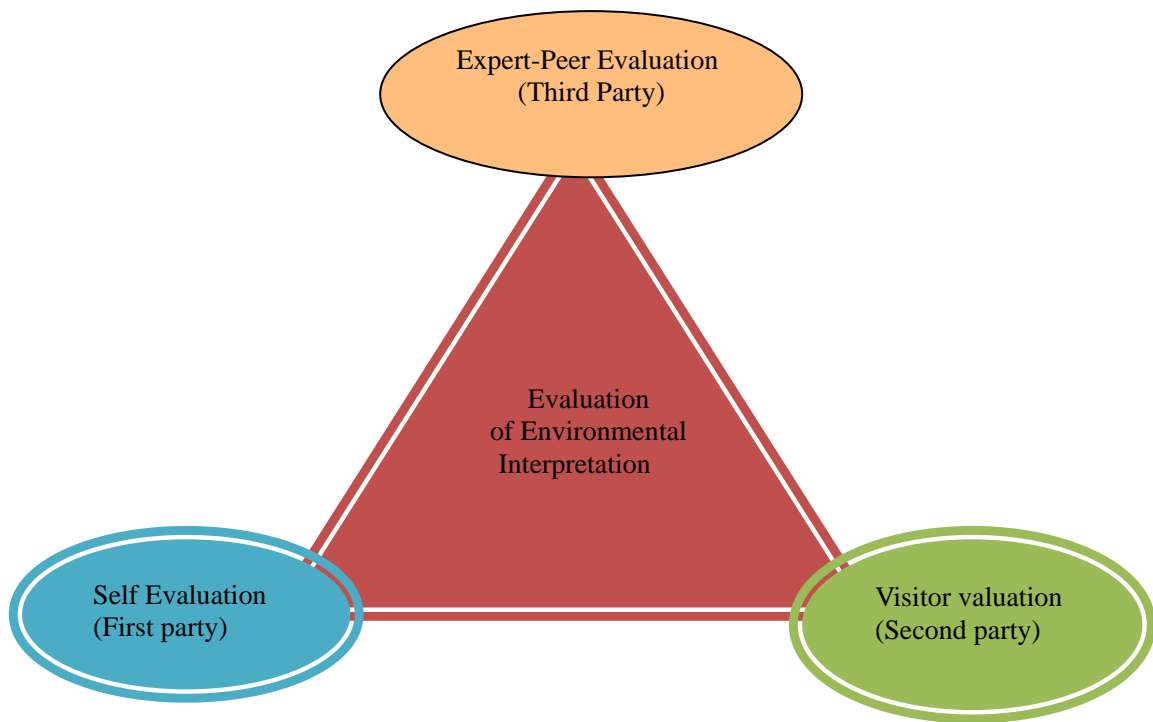
Criterion	Indicators	Standards	Score
Functional needs  (29)	Visitor center(or ticketing office) (9)	Information center “meeting and starting” point for excursions	1
		The appearance of the building, grounds, and neighborhood fits with the Geopark theme and its identity	1
		deliver the warm welcome (e.g. nice attitude)	2
		Accessible for wheelchair users and other disabilities	2
		Offer tourist information at the centre	3
	Restroom facility (7)	Clear orientation to restrooms	3
		Hygiene products available (toilet paper, hand soap etc.)	2
		Keep clean	2
	Basic information and consultation (13)	Easy to get maps and information sheets	2
		Own website with general information about the Geopark	2
		Offer the information about the safety or other situations may occur in the Geopark	1
		Deliver the information about regulations and limitation for visitors	1
		Clear orientation panels or signs	3
Interpretation panels along trails are enough and regularly disseminated		3	
Warning panel or signs at the dangerous places		1	
Social needs (43)	Environmental protection (8)	Provision for enforcement of regulations (no digging and collection)	2
		Use of observation posts, guarding and patrolling by wardens	2
		Offering collecting of geological specimens under supervision at selected sites	2
		Use of environment friendly facility( e.g. clean-running vehicles)	2
	Environmental education (10)	Permanent staff include specialists in environmental education who undertake such work as their main role	2
		Personal and individual program offered to children who come to the Geopark with their parents	2
		Operate a special program for primary/elementary school classes	2
		Operate a special program for secondary/high school classes	2
		University camps/education centers for internships	2
	Geopark publication (11)	Popular literature for public (e.g. Books, guide books)	2
Natural and cultural and historical elements of the Geopark and its neighboring area		3	
Develop the related educational materials for school classes		2	
Electronic publications, like film, CD, DVD, etc.		2	

(43)		Multi-languages publication	2	
	Personnel interpretation (14)	Service attitude	Well-dressed and behaved	1
			Positive attitude, appropriate humor	2
			Considers and responds to visitors' needs	1
		Interpretive content	Relevant	1
			Accurate	2
			Understandable	3
			Thematic	2
		Interpretive skills	Provocative/enjoyable	1
			Organized	1
Experiential needs (28)		Special program (6)	Alternatives programs available if tour impossible due to bad weather conditions.	2
	Interpretation programs exist for different ages		2	
	Special, scientific programs exist		2	
	Multimedia Interpretation (10)	Films, video, slideshow etc.	3	
		Interactive displays	2	
		Audio interpretation equipment	3	
		Access to computers and internet	2	
	Geological museum (12)	Attractive	2	
		Specific theme or different themes show the logic connection	1	
		Introduce natural characteristics of the Geopark and local area	1	
		Introduce cultural and historical characteristics of the Geopark and local area	1	
		Suitable content for different age groups	2	
		Well-designed exhibition space	1	
		Clear orientation to different themes	2	
		Use of a variety of interpretation methods	2	
Total			100	

#### 4.4 Tripartite Evaluation Model of Environmental Interpretation

The establishment of an evaluation indicator framework of environmental interpretation for a Geopark solves the problem of what to evaluate. The next step, in the study is to identify who to evaluate by the tripartite evaluation model of environmental interpretation (Figure 4.9). The model includes first party evaluation, self-evaluation; second-party evaluation, visitor evaluation; and third party evaluation, expert and peer evaluation.

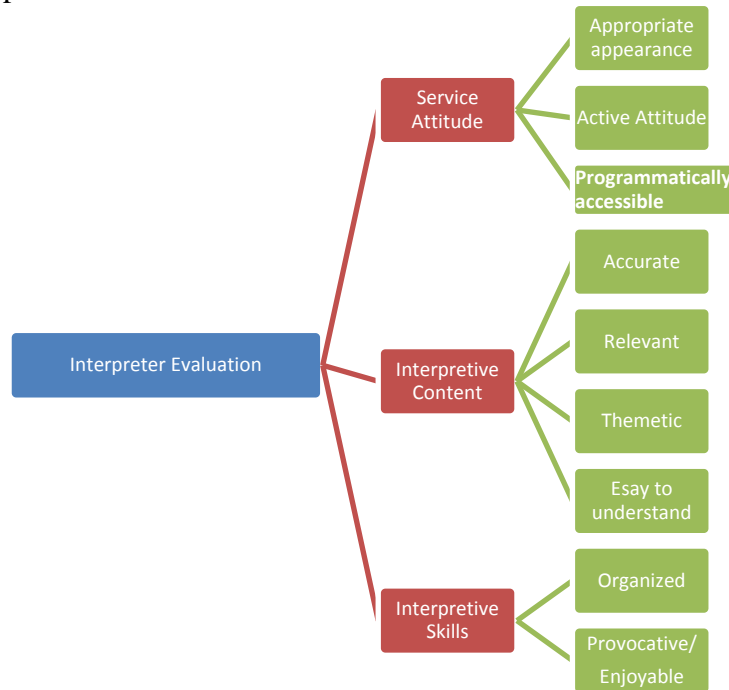
Figure 4.9 Tripartite Evaluation Model of Environmental Interpretation



#### 4.4.1 Self-evaluation

Self-evaluation can be applied to the Geoparks' performance measures and an interpreter's reflection on his/her skills and knowledge. Geopark's performance measures can be done by the evaluation indicator framework and the personal interpretation evaluation is an important part. For new interpreters or seasonal staff, self-evaluation is very helpful after the conclusion of a training program and a few initial presentations. For experienced interpreters, a self-evaluation can help them to improve the service continuously. The most common method of self-evaluation is to fill out an evaluation form. The study develops an evaluation form that can be used in the future. The evaluation is designed for interpreters using the literature review and the Geoparks' unique objectives (Table 4.9). The evaluation form can be used as the self-evaluation of the interpreters and also the basis for the employee's appraisal in a Geopark (McDonald, 2002). The interpreter evaluation has three parts, service attitude, interpretive content and interpretive skills (Figure 4.10, p.72).

Figure 4.10 Interpreter Evaluation



### 1. Service attitude

The tone of a Geopark is set partly by the interpreter who has contact with visitors. An interpreter should have an active attitude and appropriate appearance. His/her behavior should consider the visitors' needs, especially the ones with disability.

#### **Appropriate appearance**

It is reasonable for a Geopark to expect and require the interpreters to be exemplars of professionalism. This includes the manner of dress and appearance. Dressing and body language in a professional manner will enhance their authority in the eyes of the visitors.

- Appropriate mannerisms, gestures and body language
- Dress properly

## **Positive attitude**

If an interpreter has an active attitude and self-confidence, uses appropriate humor and displays enthusiasm these attributes can contribute to the visitors' enjoyment.

- Active attitude and enthusiasm
- Appropriate humor (California Department of Parks and Recreation 2002).

## **Programmatically Accessible**

A high-quality program uses a wide variety of techniques to involve the senses and accommodate a variety of people with disabilities. All visitors may benefit from the use of accessible communication techniques such as hand-held objects, descriptive language, large-print brochures, program outlines, tape recordings, assistive listening devices and written transcripts of programs.

- Thorough orientation – visitors have a better understanding of where to find restrooms, exits, rest stops, availability of services for people with disabilities and language options.
- Uses a variety of senses to communicate concepts
- Faces audience, speaks with mouth visible for possible lip reading
- Considers and responds to visitors' needs
- Good volume, pronunciation and enunciation
- Comfortable and appropriate pace (California Department of Parks and Recreation 2002).

## **2. Interpretive content**

A successful interpretation program makes a lasting impression on visitors, enabling them to retain key points that were made. Ideally, visitors will be inspired in

a way that leads to a change in their attitudes and/or their behavior. For achieving it, the interpretive content must be relevant, accurate, organized and provocative.

### **Relevant**

A high-quality interpretive program must be appropriate to the audience, using examples, analogies, comparisons and other techniques to make the presentation personally meaningful to the visitor. It must relate to the visitors' lives and experiences.

- Use of comparisons to relate new ideas to familiar concepts
- Appropriate to age and ability level of group
- Appropriate program length
- Relates the message/mission and park objectives to the visitors' lives

(California Department of Parks and Recreation 2002).

### **Accurate**

A high-quality program must present well researched information that is factual, current, complete and appropriately credited. Controversy and theory regarding the facts must be presented with a balanced perspective. Historic costumes must be accurate and well researched.

- Well-prepared, well-researched (costume if applicable)
- Correct facts
- Balanced presentation of theories (California Department of Parks and Recreation 2002).

### **Thematic**

A high-quality program presents a clear theme that is developed and supported throughout the presentation. The theme is vital to the success of the program because it focuses and reinforces the key message being conveyed.



- Has a discernible theme statement
- Theme addresses the significance of a Geopark and helps bring the park to life
- Key points develop the theme

### **Easy to understand**

A successful interpretation program should be easy for visitors to understand and enable them to retain key points that were made. For an interpreter, some skills should be used to make visitor understand well and keep deep impression.

- Uses questions to check for understanding
- Conclusion includes a review or summary to make sure visitors understood the
- Major points (California Department of Parks and Recreation 2002).

### **3. Interpretive Skills**

There are many interpretive skills for interpreters, but among the most important is the ability to make the presentation organized, provocative and enjoyable.

#### **Organized**

A high-quality program includes an introduction, body and conclusion. It is outlined sequentially and logically with meaningful transitions that link main ideas.

- Introduction, body and conclusion
- Effective transitions
- Good sequence and progression of ideas

#### **Provocative/Enjoyable**

A high-quality program inspires the audience. The program holds visitors' attention, provokes thought and participation and brings about a new perspective and/or sense of meaning and connection to the resource. It is presented with good speaking and communication skills. The program also conveys the self-confidence and enthusiasm of the interpreter, contributing to the visitors' enjoyment.

- Program is thought-provoking and engaging
- Leads the group in active participation
- Encourages visitor feedback (California Department of Parks and Recreation 2002).

Table 4.9 Interpreter Evaluation Form

Interpreter		Name of program		Place			Date		
Theme		Start time	Ending Time	Attendance			Evaluator		
Items				Poor	Need Improvement	Standard	Good	Excellent	Comments
Appearance	Appropriate appearance			1	2	3	4	5	
	Appropriate mannerisms, gestures and body language.			1	2	3	4	5	
Attitude	Positive attitude			1	2	3	4	5	
	appropriate humor			1	2	3	4	5	
Programmatically Accessible	Thorough orientation — restrooms, exits, length of program, rest stops, availability of services for people with disabilities or limited English. etc.			1	2	3	4	5	
	Uses a variety of senses to communicate concepts.			1	2	3	4	5	
	Faces audience, speaks with mouth visible for possible lip reading.			1	2	3	4	5	
	Considers and responds to visitors' needs.			1	2	3	4	5	
	Good volume, pronunciation and enunciation.			1	2	3	4	5	
	Comfortable and appropriate pace.			1	2	3	4	5	
Easy to Understand	Uses questions to check for understanding.			1	2	3	4	5	
	Conclusion includes a review or summary to make sure visitors understood major points.			1	2	3	4	5	
Accurate	Well-prepared, well-researched (costume if applicable).			1	2	3	4	5	
	Correct facts.			1	2	3	4	5	
	Balanced presentation of theories.								
Thematic	Has a discernable theme statement.			1	2	3	4	5	
	Key points develop the theme.			1	2	3	4	5	
	Theme addresses the significance of the park and helps bring the park to life.			1	2	3	4	5	
Relevant	Use of comparisons to relate new ideas to familiar concepts.			1	2	3	4	5	
	Appropriate program length.			1	2	3	4	5	

	Appropriate to age and ability level of group.	1	2	3	4	5	
	Relates message/mission and park objectives to visitors' lives.	1	2	3	4	5	
Organized	Introduction, body, conclusion.	1	2	3	4	5	
	Effective transitions.	1	2	3	4	5	
	Good sequence and progression of ideas.	1	2	3	4	5	
Enjoyable	Program is thought-provoking and engaging.	1	2	3	4	5	
	Leads the group in active participation.	1	2	3	4	5	
	Encourages visitor feedback.	1	2	3	4	5	
Recommendations							
Comments Discussed With		Evaluator Signature		Date		Telephone	
Interpreter      Supervisor							

Adopted from Standard RAPPORT Form DPR 461(California Department of Parks and Recreation, 2002)

#### 4.4.2 Second-party Evaluation

Second-party evaluation is the visitor evaluation. Visitors are the principal customers of environmental interpretation programs. While there are other customers, park visitors' opinions provide important information on program effectiveness.

Visitor evaluation helps Geopark managers and interpretive program leaders answer the following questions:

- Do visitors enjoy the environmental interpretation programs?
- Are the primary interpretive themes of the Geopark being addressed through the programs?
- Do the programs effectively inspire attitudes and behaviors that help preserve Geopark resources, promote safety and increase appreciation for the Geopark?
- Does the visitor receive information and orientation needed to fully appreciate the Geopark?
- Do visitors with disabilities receive equal access to the programs, facilities and communications?

- Are there sufficient programs available for Geopark visitors?
- What types of programs would be best received by visitors?
- How can a Geopark change the current offerings to better meet visitor needs?

(California Department of Parks and Recreation 2002)

Getting evaluation from the visitors ranges from reading their reactions during a program making instantaneous adjustments to gathering trend data over a season or several years (Knudson, 2003). How the visitors respond during an interpretation program provides instant feedback that an interpreter can put to immediate use. Direct observation shows attentiveness through smiles, laughter, intellectual response, and alert eyes. Careful observation of the visitors during a walk or talk can reveal whether people are paying attention. If visitors talk with each other, fidget, or leave the program, then something may be wrong (Knudson, 2003).

The most meaningful information can be obtained by checking for knowledge before and after the program and then comparing the results. This comparison shows what learning took place during the visitation. A response card given before and after a visit should be short and direct, focusing only on primary objectives (California Department of Parks and Recreation, 2002).

More complex, in-depth testing can be utilized if an evaluation places a high priority on test results and measuring performance objectives. This may be appropriate for programs that are designed for high school or college students, where participation in testing may assist in meeting specific educational goals or serving a specialized visitor group.

In some situations, more formal visitor evaluation can come from individual responses to brief written or oral questionnaires. The questionnaire gives visitor feedback to the interpreter and managers. It is a tool to measure visitor satisfaction. It

is simple and inexpensive to implement. Data is readily available to use for improvements in a format that is easy to analyze. But this form is simplified and does not provide information on performance objectives for learning and behavior (California Department of Parks and Recreation, 2002).

#### **4.4.3 Third-party Evaluation**

Third-party evaluation is the evaluation of organization or individuals who have the profession authority, and it includes expert evaluation and peer evaluation.

##### **Expert Evaluation**

Experts have experience, education and training that allow them to efficiently assess a program's strengths and weaknesses, including aspects that might otherwise go unnoticed. Many experts are interpretive professionals with a deep awareness of the subtleties of the art of interpretation. They are versed in its vocabulary and can articulate the qualities of a program. They have developed skills to analyze and describe the many levels of communication within a program.

Interpretive experts may have a specialty such as accessibility, environmental education, exhibit design, etc. By making use of expert evaluation, a park can make significant improvements in areas where staff may have little training or experience. In some cases an "expert" may be a university student with a specialized field of study. It may be appropriate for a graduate student to perform an evaluation as part of a thesis project.

Experts can be utilized not only in the evaluation process, but also in training or workshops that inspire and motivate interpretive staff and docents. The involvement of experts can be viewed as an opportunity to network with professionals in the field.

Expert evaluation can be applied not only to live interpretive programs, but also to facilities such as exhibits, visitor centers and audio-visual programs.

Ideally, environmental interpretation evaluation is an element of a well-coordinated improvement plan. If the plan identifies the need for expert evaluation, the following steps are recommended in order to reap the greatest benefit from expert evaluation:

1. Identify the goals and objectives of the expert evaluation.
2. Research the availability of an expert who would be appropriate to evaluate the park's interpretive program(s), goals and objectives.
3. Meet with the expert to plan the evaluation. If the expert will view live interpretive programs, there should be meetings with the live interpreters to allow the participants to become familiar with each other and what is expected through the evaluation process.
4. The expert conducts the evaluation(s). This may or may not include the use of a specific form or questionnaire that is applicable to the program.
5. Results of the evaluation(s) are discussed with staff or individual Geopark interpreters.
6. A written narrative of the evaluation findings and recommendations is submitted by the expert.
7. The park implements improvements based on the expert's recommendations.
8. Follow-up evaluations may be conducted (California Department of Parks and Recreation, 2002).

### **Peer Evaluation**

Peer evaluation is a method that harnesses the knowledge of skilled interpreters, and it is a dynamic evaluation method that allows an entire group of interpreters to

build upon each other's skills. When managers have limited time, peer evaluation provides interpreters with the feedback and interaction they need to keep their programs current and of high quality.

Some experienced peers can evaluate new interpreters for improving the interpretation quality. More commonly, members of a training session informally practice their presentations, and comment on each other's work in the development phase. The effect of peer evaluation depends heavily on the chemistry and communication skills of each peer within a certain group. Some interpreters may find it difficult to critique their co-workers, teammates and social friends.

Peer "observation" is another term for peer evaluation that gives a less pressure in some cases. Peers are asked to observe specific techniques –how often they are used and when they are used in a program. Thus peer's comments take the form of an objective evaluation rather than subjective comments. The process can be structured to provide positive feedback and allow the observers to provide a great deal of support.

A peer evaluation program can be successful if carefully planned and structured. For the best results, the concept of peer evaluation should be introduced and practiced in training. There should be a strong emphasis on communication skills and each interpreter should be prepared to give and receive appropriate comments from peers (California Department of Parks and Recreation, 2002).

In summary, Chapter 4 established the evaluation indicator framework, developed the tripartite evaluation model, and adapted an interpreter evaluation form. In the next chapter environmental interpretation of Yuntaishan World Geopark will be evaluated.

## Chapter 5 Case Study of Yuntaishan World Geopark

This chapter will describe Yuntaishan World Geopark, use a tripartite evaluation model of environmental interpretation to evaluate the status quo of environmental interpretation, and make recommendation for improving the quality of the service provided visitors to the park.

### 5.1 Self-Evaluation

The study will make use of the evaluation indicator framework of geoparks environmental interpretation to help Yuntaishan World Geopark to make the self-evaluation. The study makes use of the data and questionnaires collected by Yuntaishan Geopark personnel and evaluates that data using the evaluation indicator framework which includes social needs, functional needs and experiential needs.

#### 5.1.1 Evaluation of Functional Needs

##### Visitor Center

The visitor center was built in 2002 and is located at the entrance of the Geopark (Figure 5.1.1). The visitor center includes the entrance (Figure 5.1.2), the ticket office (Figure 5.1.3), and the parking lot that can hold 5000 vehicles (Figure 5.1.4). The visitor center provides a comprehensive service for visitors such as ticketing, orientation, basic information, etc.

Figure 5.1 Visitor Center



Figure 5.1.1



Figure 5.1.2





Figure 5.1.3



Figure 5.1.4

In the front of the visitor center, there are five LED display panels to orient the visitors to the park and give them information they need to prepare for their visit. In the visitor center, it has lockers (Figure 5.2.1), handicapped wheelchairs (Figure 5.2.2), baby carts, audio-guide devices, a telephone room (Figure 5.2.3) a visitor lounge (Figure 5.2.4); cell phone chargers (Figure 5.2.5) three post offices; and 10 smoking rooms for smokers. There is a table containing a model of the park which orients visitors to the different scenic spots and service facilities in the park (Figure 5.2.6). The visitors can obtain free brochures and maps (Figure 5.2.7), information on the medical clinic (Figure 5.2.8), hot water for tea and soup, and additional help and free materials from the staff.

#### Figure 5.2 Visitor Center



Figure 5.2.1



Figure 5.2.2



Figure 5.2.3



Figure 5.2.4



Figure 5.2.5

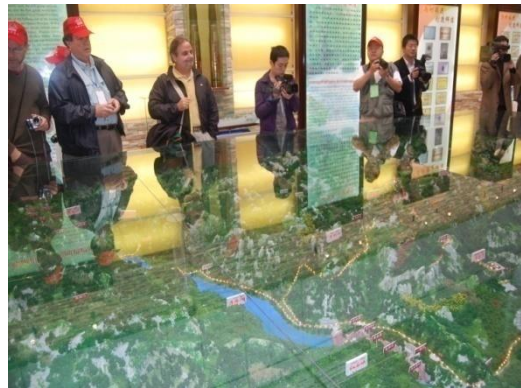


Figure 5.2.6



Figure 5.2.7



Figure 5.2.8

## Restroom Facility

Yuntaishan built 15 star-level restrooms according to strict design standard (Figure 5.3.1; Figure 5.3.2), six new technology ecological restrooms (Figure 5.2.3) and 16 environment friendly restrooms (Figure 5.3.4). Also shown below are the restroom sanitation regulation; the restroom management bylaws; and the restroom operation regulation. These regulations guarantee high standards of the management of the restrooms (Figure 5.3.5). There are clear panels on which direction are printed

to aid visitors in finding where the restrooms are located (Figure 5.3.6). Most restrooms are handicapped accessible (Figure 5.3.1).

Figure 5.3 Restroom facility



Figure 5.3.1



Figure 5.3.2



Figure 5.3.3



Figure 5.3.4



Figure 5.3.5



Figure 5.3.6

### Basic Information and Orientation

Yuntaishan Geopark has a website (<http://www.yuntaishan.net/>) that introduces information about the park to interested visitors. One can also buy tickets on the website. Yuntaishan Geopark advertises on Xinhua News website and China

Intelligence Website. In addition, the park cooperates with famous tourism resorts, like Emei Mountain, Sanya and Lingshan etc. to give visibility to the beauties of the park and encourage visitors. This advertisement is a shared project. Yuntaishan is very active in advertising its self. First of all, they advertise on the Channel 1 and 4 of China Central Television and other TV stations. Second, they advertise in different newspapers, like Beijing Daily News, Henan Daily, Shanghai News, Shijianzhuang Daily etc. Third, they sponsor sporting activities such as Yuntaishan Cup table tennis competition. Through these methods, more and more people begin to know about Yuntaishan.

When buying a ticket, visitors receive a brochure entitled Yuntaishan Geopark Guide that contains a map of the park, and additional informative information (Figure 5.4.1). The cover of the brochure (Figure 5.4.2) is a picture of Hongshi Valley, the inner part of the brochure is the guide map and the introduction of Yuntaishan Geopark in English and Chinese, and on the back cover of the brochure is the transportation map (Figure 5.4.3).

Except for the visitor center, the lounge (Figure 5.5.1) and consultation centers (Figure 5.5.2) are built in scenic areas of the park for visitors' convenience and enjoyment. There are three kinds of wayside exhibitions in Yuntaishan Geopark which are orientation type, education type and management type. Orientation type is the transportation and guiding panels, the education type is the introduction of the natural and cultural landscape in the park, and the management type is mainly the warning and regulation panels. The panels are mainly made of woods and stones that are environment friendly.

Figure 5.4 Brochure

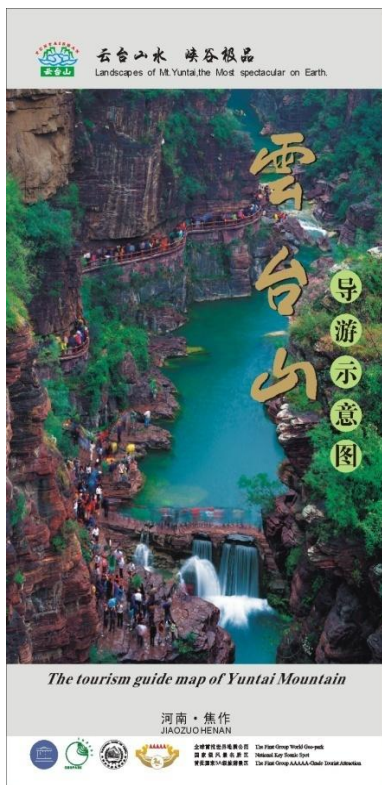


Figure 5.4.1

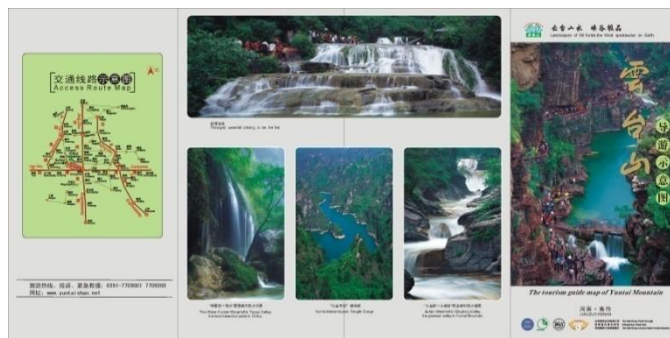


Figure 5.4.2



Figure 5.4.3

Figure 5.5 Lounge and Consultation Center



Figure 5.5.1



Figure 5.5.2

(1) Orientation Type

The large transportation and orientation panels are set up along the ways to Yuntaishan Geopark (Figure 5.6.1). The panels use four languages: Chinese, English, Japanese and Korean and marks the distance to various locations (Figure 5.6.2). Some panels use natural ways to present (Figure 5.6.3) and some use the maps to orient (Figure 5.6.4).

Figure 5.6 Orientation type panels



Figure 5.6.1



Figure 5.6.2



Figure 5.6.3



Figure 5.6.4

## (2) Education Type

Education type panels introduce the natural and cultural characteristics of Yuntaishan Geopark. Some panels use Chinese, English, Japanese and Korea four languages (Figure 5.7.1) and some panels are carved in the local materials (Figure 5.7.2) and they become part of the scene. In some special places, the panels are set up, such as the place where zircon 3.5 trillion years ago was collected (Figure 5.7.3). Some educational type panels use the pictures or maps to present (Figure 5.7.4).

## (3) Management Type

Management type panels helps the park staff by presenting regulations (Figure 5.8.1), warning visitors of dangerous situations (Figure 5.8.2, figure 5.8.3), informing visitors of other safety issues (Figure 5.8.4) limiting the behavior of the visitors (Figure 5.8.5) and protecting animals from visitor interference (Figure 5.8.6).

Figure 5.7 Education type panels



Figure 5.7.1



Figure 5.7.2



Figure 5.7.3



Figure 5.7.4

Figure 5.8 Management type panels



Figure 5.8.1



Figure 5.8.2



Figure 5.8.3



Figure 5.8.4



Figure 5.8.5



Figure 5.8.6

### 5.1.2 Evaluation about Social Needs

Evaluation regarding social needs include four parts: environmental protection, environmental education activities, publication, and personal interpretation. This study made use of the data collected by Yuntaishan Geopark to enable the researcher to analyze and study the state of social needs of environmental interpretation in park.

#### Environmental Protection

Local government is responsible for the plan, construction, daily management, public security and business of Yuntaishan Geopark. The local government enacted Yuntaishan Geopark special management regulations according to national law and regulations. According to different functions, the park is divided into three kinds of areas, the protected area, tourism area and service area. Generally, the visitors are not allowed to enter into the protected area, only the scientists for the research purpose and the management staff and some special visitors can enter into it with permission. Buildings and facilities are strictly limited to be built in tourism area, and the population and construction are strictly controlled in service area. Yuntaishan Geopark Authority spends about 10% of the ticket income for environmental protection. For the precious flora, like *Taxus Chinensis*, *Acer mono Maxim Carr*, *Diospyros lotus* Linn etc., are protected by fences and interpretation panels are used to inform visitors of the delicacies of the plant life (Figure 5.9.1). For the precious fauna, like Taihang



Macagues, monachus, Circus cyaneus etc., they are not only fed regularly and the visitors are persuaded not to bother them by the panel system and personal interpretation (Figure 5.9.2).

Figure 5.9 Environmental Protection 1



Figure 5.9.1



Figure 5.9.2

Yuntaishan Geopark Authority set up the special team to guard and patrol the scenic spots for environmental protection and the panels are also used to advise the visitors to protect environment (Figure 5.10.1 & Figure 5.10.2).

In order to solve the pollution problem of automobile exhaust, Yuntaishan Geopark Authority invested more than 1 million dollars to buy 130 clean-running vehicles and 20 battery powered cars (Figure 5.11). There are 844 assorted dustbins distributed evenly (Figure 5.12).

Figure 5.10 Environmental Protection 2



Figure 5.10.1



Figure 5.10.2

Figure 5.11 Clean Running Vehicles



Figure 5.12 Dustbins



Yuntaishan Geopark Authority establishes environment monitoring system and Geographical Information system, collects the data about water, air, forest and geology and monitors and analyzes changes in order to provide a base for the decision making for environmental protection.

### **Environmental Education Activities**

China Technology University, China Geology University, Beijing Normal University, Henan Technology University etc. took Yuntaishan Geopark as their research and internship base. Science and Technology Department of Henan Province identifies Yuntaishan Geopark as the science popularization and education base for adolescent. Sometimes Yuntaishan Geopark holds Science popularization Camping Week for Adolescents in Henan Province. But generally speaking, there is no long-term and stable activities for the primary and middle school students and no special people do the environmental education activities. For the children who come with their parents, there is no individual and corresponding programs, and this is the place that need improvement.

## Geopark Publication

According to the data from Yuntaishan Geopark Authority, landscape picture albums are printed in Chinese, English, Japanese and Korean, and the guidebooks, guide brochures, cards for playing poker and paper bags are published often in order to advertise the park. Famous anchorpersons and professional TV makers were invited to make the DVD and VCD for Yuntaishan Geopark. The publications about Yuntaishan Geopark were mainly published after 2000, and include videos, books, brochures, foldouts. The publications can be divided into three categories: research on natural science, research on culture and history and guide books (Figure 5.1).

Table 5.1 Yuntaishan Geopark Publication List

Name	Author(s)	Press	Year	Language
Yuntaishan	Wang shouqin, Xu Yuying (Editors)	Zhongzhou Ancient Books Press	2002	Chinese
Planning and Construction of Yuntaishan World Geopark in China	Wang Jianping, Ye Zhaohe(editors)	China Land Press	2004	Chinese
Research on Formation of Yuntai landform	Land and Resources Bureau of Jiaozuo City(Editor)	Xian Map Press	2003	Chinese
Comprehensive Planning of Yuntaishan Geopark (2003-2020)	Land and Resources Bureau of Jiaozuo City(Editor)	China Ministry of Land and Resources	2003	Chinese
Guidebook of Yuntaishan Geopark	Wang Jianping (Editor)	China Land Press		Chinese
Theory and Practice of Protection and Development of Natural Heritage Sites---Case Study of Yuntaishan Geopark	Zhao Ting, Zhao Xun	China Geological Press	2005	Chinese
Study on Yuntai Landform ---The Geoscientific Foundation for Yuntaishan World Geopark,China	Zhao Xun, Ma Yinsheng, Wu etc.	China Geological Press	2006	English
Geological Background Research on Yuntai Landform	Zhao Xun, Ma Yinsheng	China Geological Press	2005	Chinese
Finding zircon 3.4 trillion Years ago in Yuntaishan Geopark	Yuntaishan Geopark Management Authority	Land and Resources Administration of Jiaozuo City		Chinese
Field Trip Guidebook		China Land Press		Chinese
Entering into Geoparks	China Ministry of Land and Resources	China Land Press	2003	Chinese
Yuntaishan and Celebrities in different ages	Qu he(Editor)	China Wenlian Press	2003	Chinese

Yuntaishan and Poets in 7 Dynasties and	Qu he(Editor)	China Wenlian Press	2002	Chinese
Yuntaishan Landscape Valley Masterwork	(Advertisement Brochure)			Chinese
China Tourism—Yuntaishan Geopark				Chinese, English
Yuntaishan World Geopark(VCD)		Shanghai Lisheng Vedio Company	2007	Chinese
Legend about Celebrities in Yuntaishan---Taiji	Zhao Qianjie, Yang Zhonglian	Zhongzhou Ancient Books Pres	2002	Chinese
Legend of Jiaozuo City---Story of Ji Kanf and Shantaoxiangxiu	Ma Minxue	Zhongzhou Ancient Books Pres	2002	Chinese
Legend of Jiaozuo ---Story of Qinglong Valley	Xin Wenyin	Zhongzhou Ancient Books Pres	2002	Chinese
Yuntai Anthem---Poems	Li Tianhui(Editor)	Henan Art Press	2004	Chinese
Yuntai Anthem----- Prose	Li Tianhui(Editor)	Henan Art Press	2004	Chinese
Yuntai Anthem---- folk legends	Li Tianhui(Editor)	Henan Art Press	2004	Chinese
Deciphering “Jiaozuo Phenomenon”	Xu changren	China Tourism Press	2007	Chinese
Seven Celebrities in Bamboo Forest (Historical Novel)	Ma Minxue	Henan Art Press	2006	Chinese

Publications on Yuntaishan Geopark seldom have materials on science popularization for primary and middle school students and there is rarely scientific content in the guidebooks and brochures.

### **Personal Interpretation**

With the development of Yuntaishan Geopark, the team of the interpreters is expanding and there are now 143 interpreters. The famous scholars and experienced management staff are invited to give the training to the interpreters about the etiquette, culture, geological knowledge etc. in order to improve the skills and knowledge of the interpreters. The interpreter appraisal is made regularly.

March to November is the peak season for visitors and the training of interpreters is given every Friday during this period. In slack season, all the interpreters are requested to attend special training. Training includes the following content:

1. The knowledge about geology, geography and the geomorphology, climate and hydrology in local areas.
2. Communication skills, etiquette and personal appearance guide.

3. Basic knowledge is given about tourism, local culture and customs, and transportation.
4. Standard Putonghua is taught (the teaching of appropriate pronunciation).
5. With the expansion of the overseas market, more and more foreigners come to visit the Park, in order to accommodate them interpreters are given training in the English language.
6. Interpreters must study comments made by visitors in order to improve service.
7. Experienced interpreters are invited to talk about their own experience and working skills and practical experience.
8. Interpreters are oriented to the park's development and the state of the park and its facilities by park managers.

From July to November, 19 classes are given interpreters, the schedule is as following.

Table 5.2 Class Schedule of Interpreter Training

date	First Friday	Second Friday	Third Friday	Fourth Friday	Fifth Friday
July	Putonghua	Putonghua	Visitor Suggestion Study	Geological Base	
August	Geological Base	Geological Base	Geological Base	Basic English Dialogue	
September	Visitor Suggestion Study	Etiquette	Etiquette	Basic English Dialogue	Basic Knowledge of Tourism
October	Basic Knowledge of Tourism	Basic Knowledge of Tourism	Basic Knowledge of Tourism		
November	Visitor Suggestion Study	Basic English Dialogue	Basic English Dialogue	Group Discussion	
December	Experienced Interpreters' speech	Management of Yuntaishan Geopark			

### 5.1.3 Evaluation of Experiential Needs

Evaluation of experiential needs includes three parts: special programs; multimedia facility; and geological museum. This study makes use of the data collected by Yuntaishan Geopark to evaluate the experiential needs.

#### Special Programs

In case of inclement weather, visitors can stay in the visitor center and read the free materials provided by Yuntaishan Geopark. Currently, there are no alternative programs at Yuntaishan Geopark such as indoor interpretation and programs for the elderly and young. The quality of interpretation depends on the training of the interpreters. If an interpreter is knowledgeable, then they can make adjustments when needed. Providing programs for young visitors, the elderly, visitors with special needs, etc. are in great need.

Yuntaishan Geopark designs a one day tour, two days tour, and three days tour according to the travel time and characteristics of different scenic spots. For a one day tour, there are three options for visitors to choose.

- A. Tanpu Valley, Quanpu Valley, Red Rock Valley
- B. Zhuyu Peak
- C. Qinglong Valley (Biggest valley in Yuntaishan Geopark)

A two day tour has three options. They are as follows:

- A. Tanpu Valley, Quanpu Valley, Red Rock Valley, Zhuyu Peak
- B. Tanpu Valley, Quanpu Valley, Red Rock Valley, Qinglong Valley
- C. Tanpu Valley, Quanpu Valley, Red Rock Valley, Baijiayan

For the three day tour, Tanpu Valley, Quanpu Valley, Red Rock Valley, Zhuyu

Peak, Wanshan Temple and Qinglong Valley are recommended to visit.

Special visitors, like the scientists who do the research and the artists for creation, are usually given special help for their work by Yuntaishan Geopark authority. For groups that come to the Park for meetings, there are special arrangements or schedules for them, but generally speaking, there is no long-term special programs that visitors can choose freely.

### **Multimedia Interpretation**

Yuntaishan Geopark is one of the 18 trial points that use a cutting edge technology not only to manage the park, but to provide services for its visitors. Technology, such as GPS, is used by management to protect the environment. Technology is also made available to visitors in the form of internet connections and informational LED screens. Managers also use a monitoring system for visitor protection and to broadcast weather reports (Figure 5.13).

Figure 5.13 LED Information Distribution System



In the visitor center, there is a big-scale digital map that the visitors can use by pressing different buttons on the control panel to find the places they want to go. Examples of locations available are scenic spots, restrooms, lounges and geological museum etc. It is convenient for the visitors to know the locations and distance of the places they want to go (Figure 5.14).

Figure 5.14 Digital Map



There is a projection room in the Geological Museum (Figure 5.15) that broadcasts videos continually so that the visitors can learn about the culture and nature of Yuntaishan Geopark. For those who cannot travel all the scenic spots, it is an alternative choice.

Figure 5.15 Projection Room



There is also a digital touch screen in the Geological Museum that visitors can use to click a button that will give them the content they are interested in learning. The visitors can rent the portable digital interpretation devices which have the interpretation of main scenic spots in Chinese and English. The visitors can choose what they want to hear on the portable digital interpretation device in order to serve their individual interests.



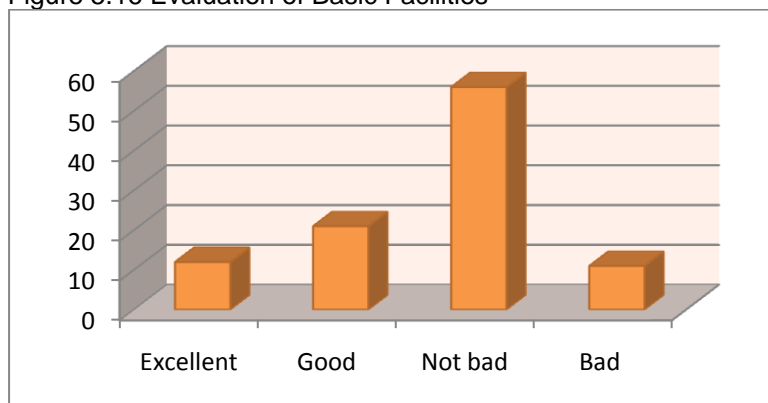
## Geological Museum

The Geological Museum is an important part of environmental interpretation at Yuntaishan Geopark and is the base for giving visitors important information about the study of science. Geological Museum is also the requirement for Chinese Geoparks to get the certification from the Ministry of Land and Resources. In 2007, the Yuntaishan Geopark Authority conducted a survey of visitors to identify their perceptions of the Geological Museum. Five hundred questionnaires were given to the visitors of the Geological Museum from the 12<sup>th</sup> to 13<sup>th</sup> of May, 2007. Four Hundred and Eighty Six questionnaire were complete usable for the study. Visitors were asked on the questionnaires about their perceptions of basic facilities, personal interpretation service, the suggestion about new geological museum and the functions of geological museum. This study uses the data collected by Park personnel and makes the following analysis.

### 1. Basic Facilities

Out of 486 effective questionnaires, 58 (12%) visitors thought that the basic facilities were excellent; 102 (21%) visitors thought that the basic facilities were good; 272 (56%) visitors thought it was not bad; and 54 (11%) visitors thought it was bad (Figure 5.16). In summary, approximately one thirds of the visitors thought the basic facilities were excellent or good.

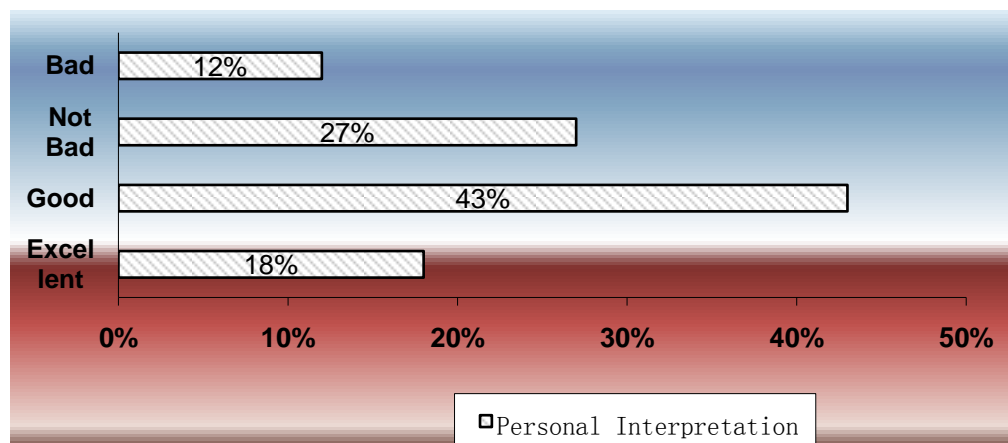
Figure 5.16 Evaluation of Basic Facilities



## 2. Personal Interpretation:

Eighty-eight (18%) visitors thought that the personal interpretation was excellent; 209 (43%) visitors thought that the personal interpretation was good; 131 (27%) visitors thought it was not bad; and 58 (12%) visitors thought that the personal interpretation was bad (Figure 5.17, p100). In summary, we see that most of the visitors are basically satisfied with the personal interpretation. The visitors who were not satisfied commented that the interpreters did not have good communication with visitors and just recited mechanically.

Figure 5.17 The Evaluation of Personal Interpretation



## 3. Shopping Environment

Many visitors are not satisfied with the shopping area in the museum (Table 5.3). They felt the Geological Museum should be a place for learning about geological knowledge and exhibition of the geological specimen and the shopping area should not be big, especially in the passageway.

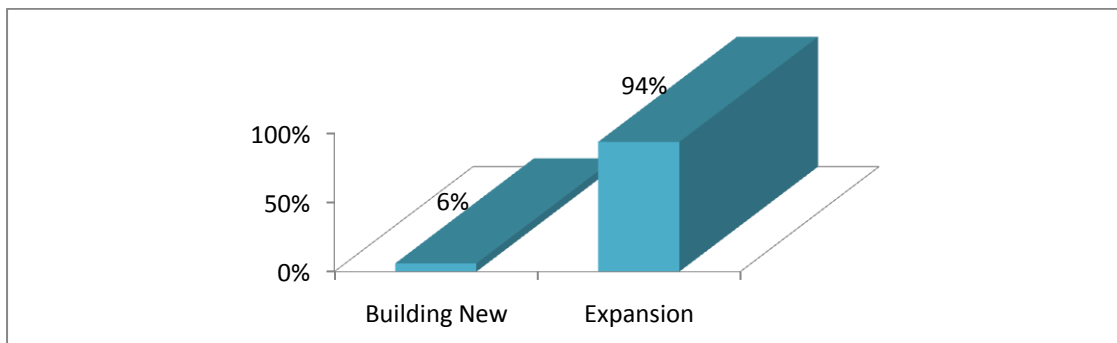
Table 5.3 Evaluation of the shopping environment

	Excellent	Good	Not Bad	Bad
Visitor number	44	136	223	83
Percent (%)	9%	28%	46%	17%

#### 4. New Geological Museum

According to the survey, 457 (94%) visitors suggested that the museum be expanded in the same style presently used. They also suggested that more geological specimen, high-tech exhibition and interpretive facilities be added. Twenty-nine (6%) visitors suggested that a new geological museum be built (Figure 5.18).

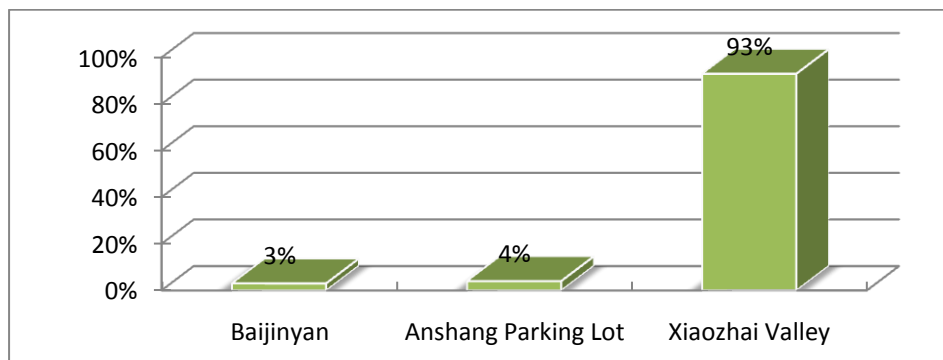
Figure 5.18 Suggestions about Geological Museum



#### 5. Location of New Geological Museum

Considering the practical situation and on the bases of not damaging the geological and ecological environment and harmonizing with the surrounding environment, three locations were presented to visitors from which to choose to build a new Geological Museum. The three suggested places were: Baijiayan, Anshang Parking Lot and Xiaozhai Valley. Four hundred and fifty two (93%) visitors chose Xiaozhaigou where the present Geological Museum is located (Figure 5.19).

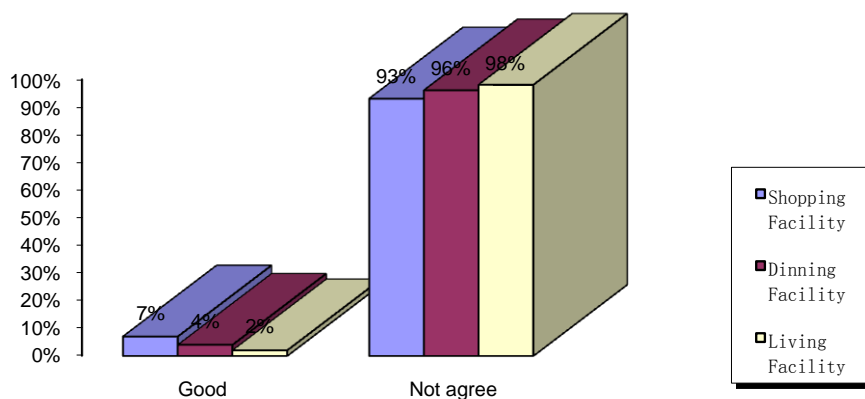
Figure 5.19 Selection of the New Geological Museum



## 6. Function of Geological Museum

Four hundred and fifty seven (94%) visitors thought that the Geological Museum was educating the public about geosciences. The visitors felt that the core function of the museum was to educate about geosciences and provide exhibitions of geological history. Visitors did not want to increase the facilities of dining and shopping because they felt it would have a negative influence on the core function of the museum (Figure 5.20). Most of the visitors reported that they had no interest in shopping in the museum; however, a few of the visitors reported that they would like to buy souvenirs related to Yuntaishan Geopark.

Figure 5.20 Geological Museum's Functions



## 7. Summary

In summarizing the information on the questionnaires given by the management of Yuntaishan Geopark, the researcher came to the following conclusions about the Geological Museum after analyzing the responses of the visitors to the survey:

- Visitors to the park felt that the core function of the museum was to educate about geosciences and provide exhibitions of geological history.
- Visitors did not want to increase the facilities of dining and shopping because they felt it would have a negative influence on the core function of the museum

- Visitors are satisfied with the basic facilities, personal interpretation and shopping environment generally.
- Visitors recommended that the Geological Museum be expanded rather than build another one. .

#### 5.1.4 Self-Evaluation Score

A Self-Evaluation Score was derived from the Evaluation Indicator Framework.

The results can be found in Table 5.4.

Table 5.4 The Score of Self-Evaluation of Environmental Interpretation for Yuntaishan Geopark

Criterion	Indicators	Standards	Score
Functional Needs (29)	Visitor Center (or Ticketing Office) (9)	Information centre “meeting and starting” point for excursions	1
		The appearance of the building, grounds, and neighborhood fits with the Geopark theme and its identity	1
		Deliver the warm welcome (e.g nice attitude)	2
		accessible for wheelchair users and other disabilities	2
		offer tourist information at the centre	2
	Restroom Facility (7)	Clear orientation to restrooms	3
		Hygiene products available (toilet paper, hand soap etc.)	2
		Keep clean	2
	Basic Information and Consultation (13)	Easy to get maps and information sheets	1.5
		Own website with general information about the Geopark	2
		Offer the information about the safety or other situations may occur in the Geopark	0.5
		Deliver the information about regulations and limitation for visitors	1
		Clear orientation panels or signs	3
		Interpretation panels along trails are enough and regularly disseminated	3
		Warning panel or signs at the dangerous places	1
Subtotal			27
	Environmental Protection (8)	Provision for enforcement of regulations (no digging and collection)	2
		Use of observation posts, guarding and patrolling by wardens	2
		Offering collecting of geological specimens under supervision at selected sites	1
		Use of environment friendly facility(e.g clean-running vehicles)	2

Social Needs (43)	Environmental Education (10)	permanent staff include specialists in environmental education who undertake such work as their main role	0
		Personal and individual program offered to children who come to the Geopark with their parents	0
		operate a special program for primary/elementary school classes	0
		operate a special program for secondary/high school classes	0
		university camps/education centers for internships	2
Social Needs (43)	Geopark Publication (11)	Popular literature for public (e.g. books, guide books)	2
		Natural and cultural and historical elements of the Geopark and its neighboring area	3
		develop the related educational materials for school classes	0
		electronic publications, like film, CD, DVD, etc.	2
		Multi-languages publication	2
	Personnel Interpretation (14)	Service attitude	4
		Interpretive Content	6
Interpretive Skills		1	
Subtotal			29
Experiential Needs (28)	Special Program (6)	Alternatives programs available if tour impossible due to bad weather conditions.	1
		Interpretation programs exist for different ages	1
		special, scientific programs exist	1.5
	multimedia interpretation (10)	Films, video, slideshow etc.	3
		Interactive displays	2
		Audio interpretation equipment	3
		Access to computers and internet	2
	Geological Museum (12)	Attractive	1
		Specific theme or different themes show the logic connection	1
		Introduce natural characteristics of the Geopark and local area	1
		Introduce cultural and historical characteristics of the Geopark and local area	0
		Suitable content for different age groups	1
		Well-designed exhibition space	1
		Clear orientation to different themes	1
Use of a variety of interpretation methods	2		
Subtotal			19.5
Total			75.5

From Table 5.4, we obtained a total score of 75.5 for self-evaluation. The highest total score is 100 when analyzing the three components. For component one,

functional needs, the score was 27 out of 29 which is very high. For component two, social needs, the score was 29 out of 43 which is low especially for environmental education activities. For component three, experiential needs, the score was 19.5 out of 28 which is moderate. This indicates that work is needed in the areas of social and experiential needs to improve the programs, and the functional needs are being met.

## **5.2 Visitor Evaluation**

In order to know the evaluation of environmental interpretation from visitors, Yuntaishan Geopark Authority conducted a visitor survey in May, 2007. They gave out to visitors 650 questionnaires (Appendix B) and were able to use 635 out of these in the analysis. Although the questionnaire was composed of three parts, for this study only the visitor evaluation was used.

In this part of the study, the following aspects of the park will be analyzed: Wayside exhibition, interpreters, audio visual multimedia and interpretive device, and visitors' preference of interpretive methods and themes. Visitors were asked to give a comprehensive evaluation of the whole system of environmental interpretation. The following are the findings:

### **5.2.1 Wayside Exhibits**

Six hundred and twenty eight (628) visitors responded to the questions about the wayside exhibits (Table 5.5). Visitors were asked to evaluate the wayside exhibits from the following perspectives.

- the content clearly states the theme(s)
- the size, color, materials are harmonious with the surrounding environments
- the content of environmental protection is included
- the total, comprehensive evaluation about the wayside exhibit.

Table 5.5 Statistics of Evaluation on Wayside Exhibits

	The content clearly states the theme(s)	Size, color, materials are harmonious with the surrounding environment	Environmental protection is included	Satisfaction levels
N Valid	628	621	621	623
Missing	7	14	14	12

More than 70% of the visitors responded that they felt that the content was clearly stated, that the panels are in harmony with the surrounding environment, and that environmental protection was included on the panels (Figure 5.21, Figure 5.22, Figure 5.23). Around 20% of visitors responded that the panels needed to be more clearly stated.

Visitor responded that they felt that more information could be given in respects to environmental protection on the panels. Figure 5.24 indicates that the satisfaction level is high.

Figure 5.21 Content Clearly States the Theme

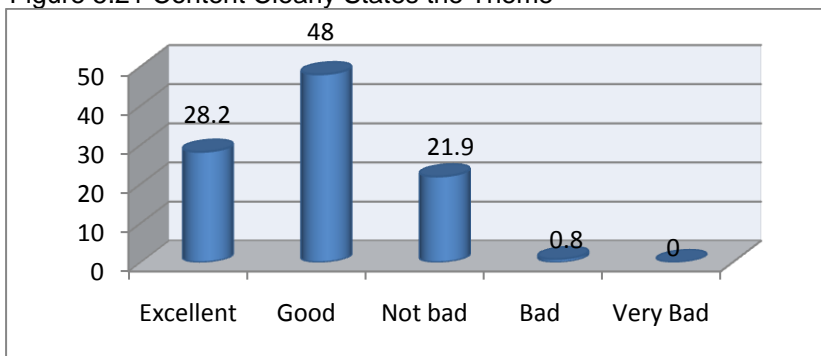


Figure 5.22 Harmony with Surrounding Environment

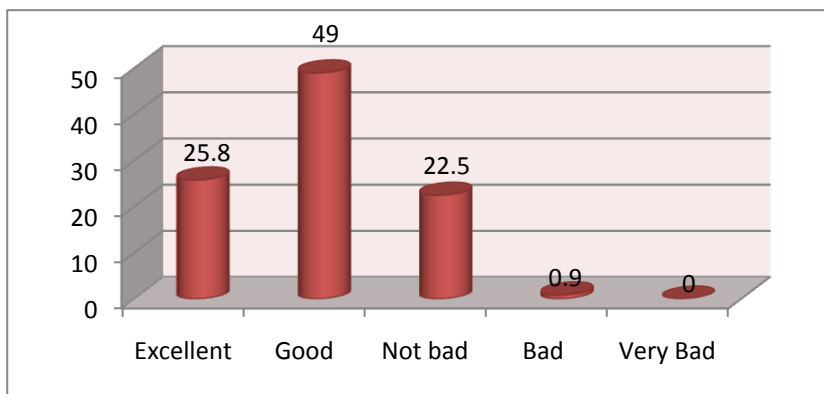




Figure 5.23 Environment Protection

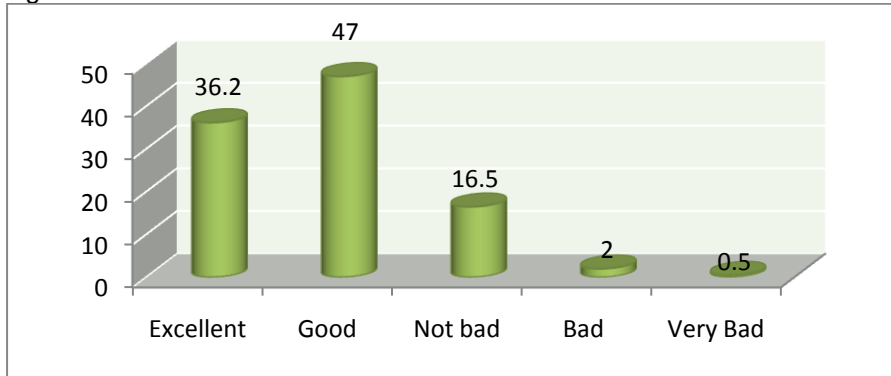
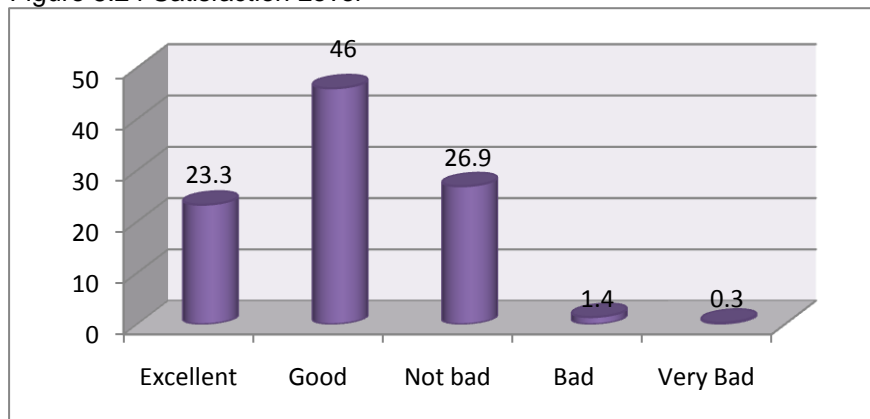


Figure 5.24 Satisfaction Level



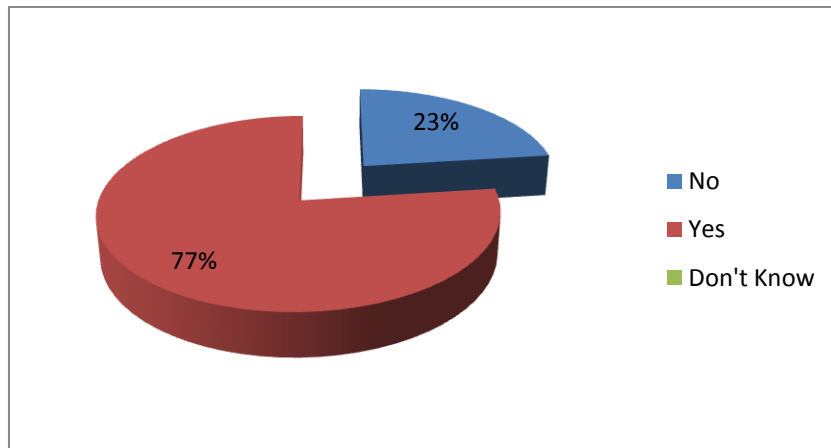
In their evaluation of wayside exhibits, visitors suggested the following:

- that more content about the history and culture of Yuntaishan Geopark be added
- that information about nature science be increased
- that more road signage be provided
- that translations into other languages be improved and
- that information on environmental protection be emphasized.

## 5.2.2 Personal Interpretation

Out of 635 visitors, 485 (76.4%) visitors chose to use the personal interpretation service (Figure 5.25).

Figure 5.25 Personal Interpretation Service



Visitors were asked to evaluate the personal interpretation service from the following perspectives (Figure 5.26, Figure 5.27, Figure 5.28, Figure 5.29, Figure 5.30, Figure 5.31, Figure 5.32, Figure 5.33). Table 5.6 shows the statistics of personal interpretation evaluation.

- Considers and responds to visitors' needs
- Accurate and scientific
- Understandable
- Positive attitude
- Organized
- Provocative
- Well-dressed and behaved
- Comprehensive evaluation

Table 5.6 Statistics of Personal Evaluation

	Considers and responds to visitors' needs	Accurate and scientific	Understandable	Organized	Provocative	Positive attitude	Well-dressed and behaved	Comprehensive evaluation
N valid	485	480	482	480	478	485	483	484
Missing	150	155	153	155	157	150	152	151

The data indicates that most of the visitors have favorable perceptions about personal interpretation. Among them 79.9% reported that the personal interpretation was excellent or good in their understanding. Thirty five point one percent (35.1%) of the visitors thought that the personal interpreters were not bad in the area of provocation, but could use improvement. Three point three percent (3.3%) of the visitors thought that the personal interpreters' accuracy was bad and that more training is needed. Generally speaking, most of the visitors are satisfied but their evaluation of the content is not very high and it means the interpreters need to have more related training and learn more relevant knowledge.

Figure 5.26 Considers and Responds to Visitors' Needs

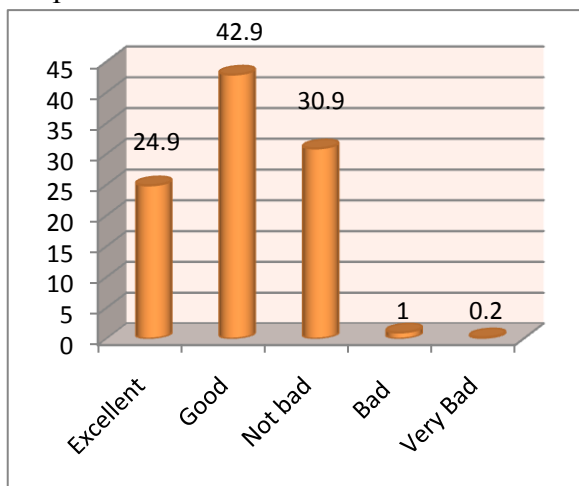


Figure 5.28 Understand

Figure 5.27 Accurate and Scientific

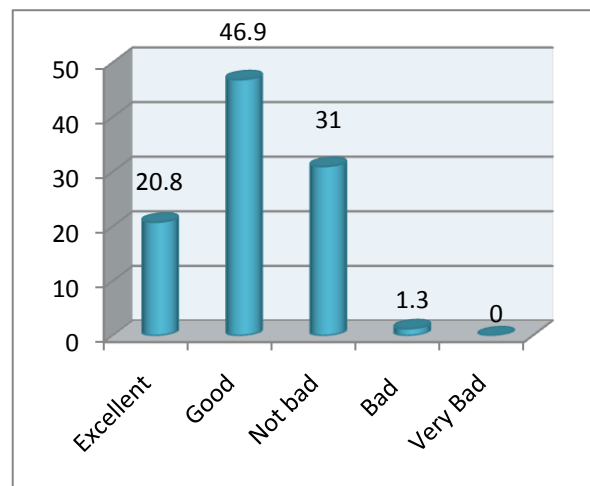


Figure 5.29 Organized

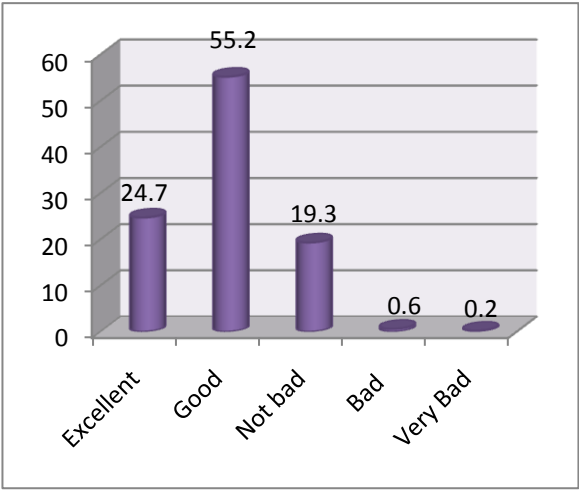


Figure 5.30 Provocative

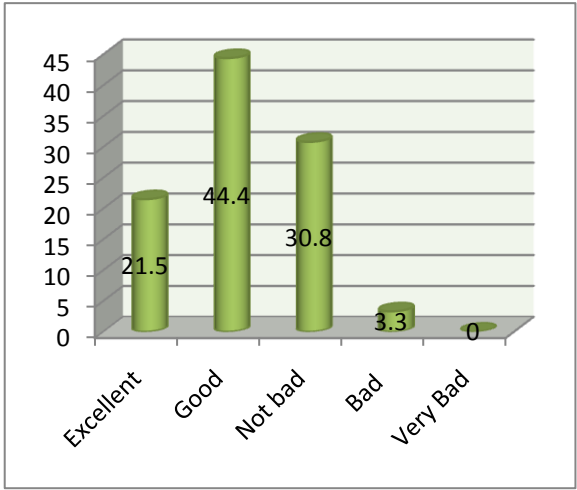


Figure 5.31 Active Attitude

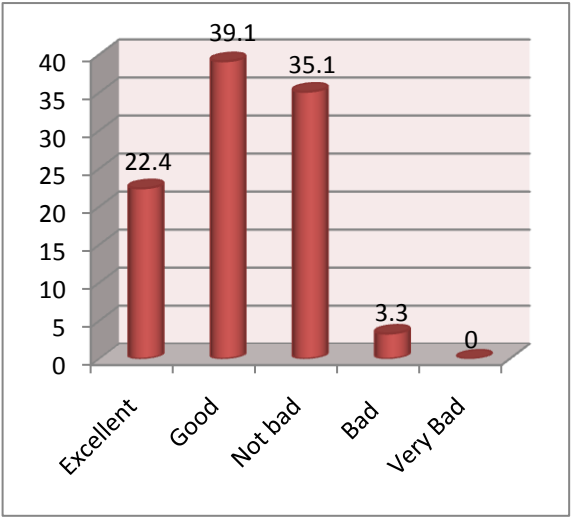


Figure 5.32 Well-behaved and Dressed

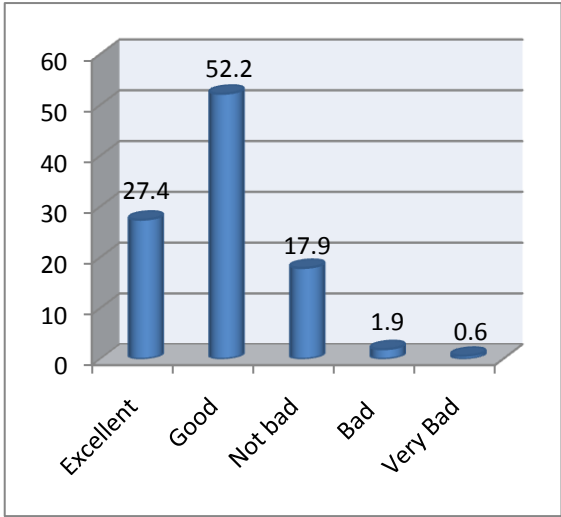
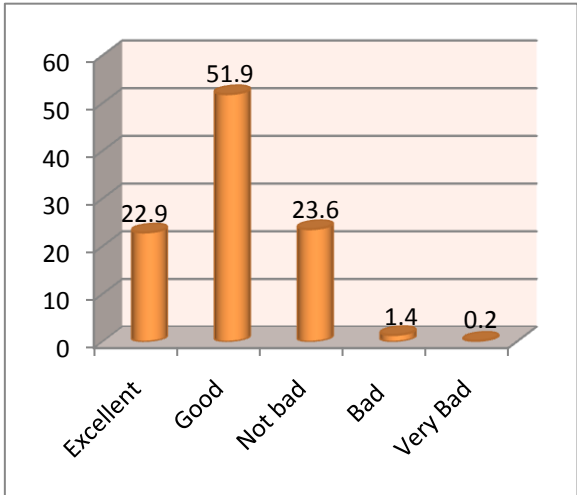
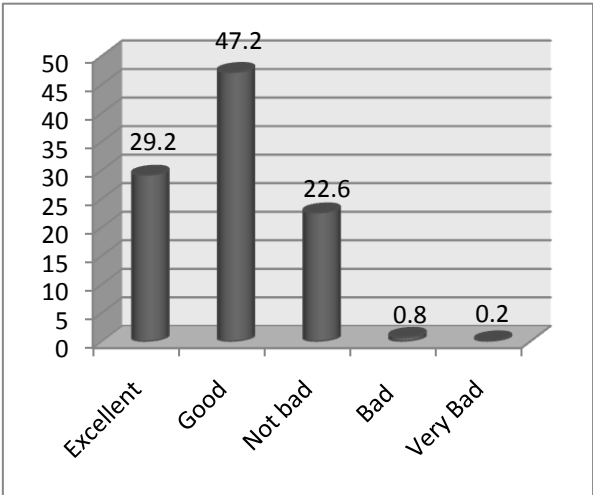


Figure 5.33 Comprehensive Evaluation



### 5.2.3 Audio Visual Multimedia Evaluation

Among 635 effective questionnaires, 549 (86.5%) of the visitors used the audio visual multimedia facility. The visitors were asked to evaluate the audio visual multimedia from the following perspectives.

- Scientific and accurate
- Understandable
- Organized
- Provocative
- Comprehensive evaluation

Evaluation results can be seen from Figure 5.34, Figure 5.35, Figure 5.36, Figure 5.37 and F Figure 5.38. Table 5.7 shows the statistics of the evaluation of audio visual multimedia.

Table 5.7 Statistics of the evaluation of audio visual multimedia

	Scientific & accurate	Understandable	Organized	Provocative	Comprehensive evaluation
N Valid	545	547	536	538	534
Missing	90	88	99	97	101

More than 74% of the visitors give the audio visual multimedia a high rating (excellent/good) on four detailed evaluation items. Compared with the personal interpretation evaluation, multimedia was rated higher. The reason for this higher rating is that the content of the multimedia is well designed, well organized, and more scientific.

Figure 5.34 Scientific and Accurate

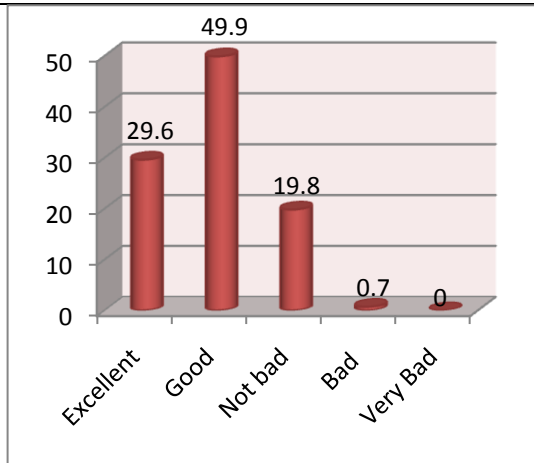


Figure 5.35 Understandable

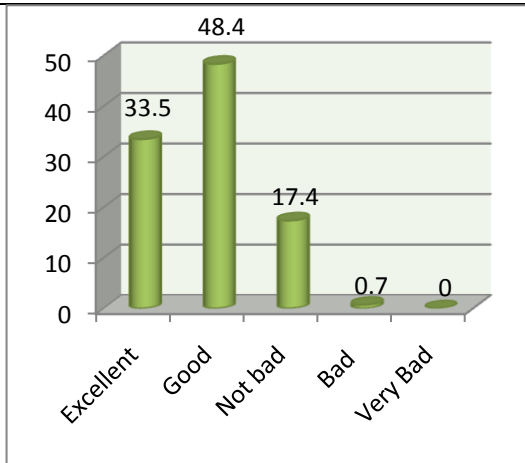


Figure 5.36 Organized

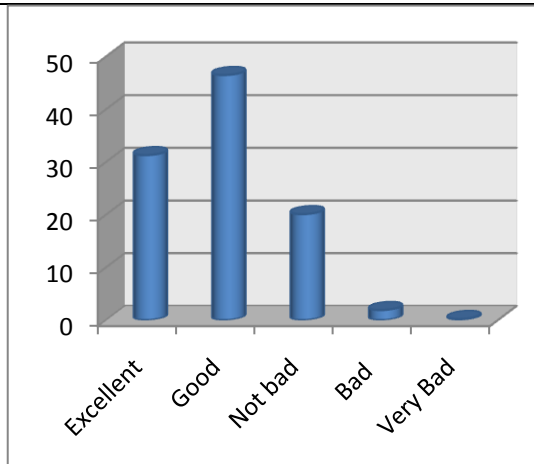


Figure 5.37 Provocative

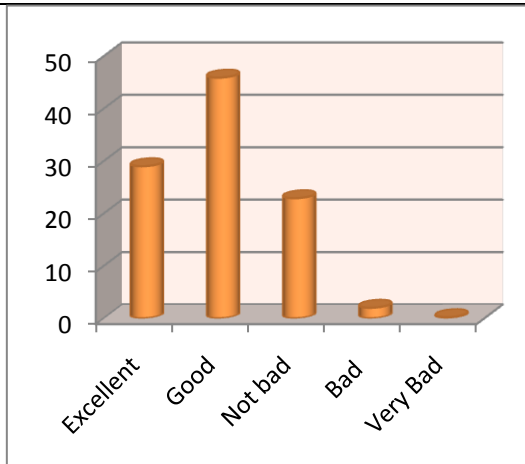
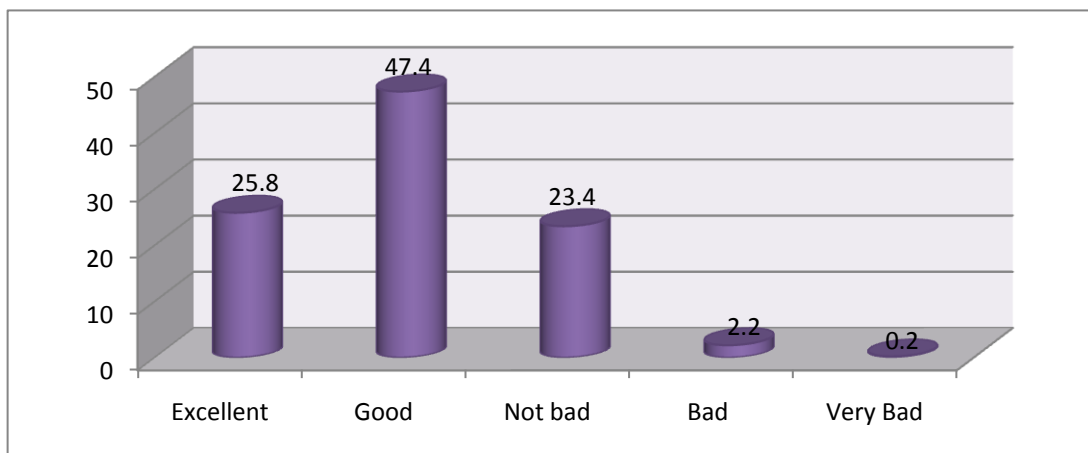


Figure 5.38 Comprehensive Evaluation



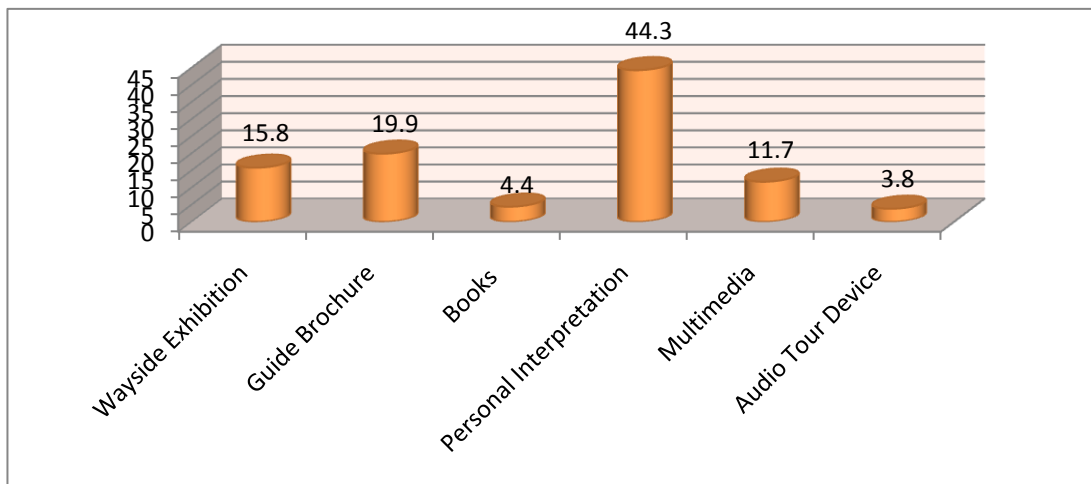
Visitors to the park report that they hope the park will add more content about history and culture, increase information about nature science, increase road signage, and improve the quality of the translation of foreign language.

### 5.2.4 Preference of Interpretive Methods and Themes

#### Preference of interpretive methods

In analyzing the data, one finds a wide range of interpretive methods. These methods include the following: Personal interpretation, guide brochure, wayside exhibition, multimedia, books, and audio tour device (Figure 5.39).

Figure 5.39 Preference of Interpretive Methods



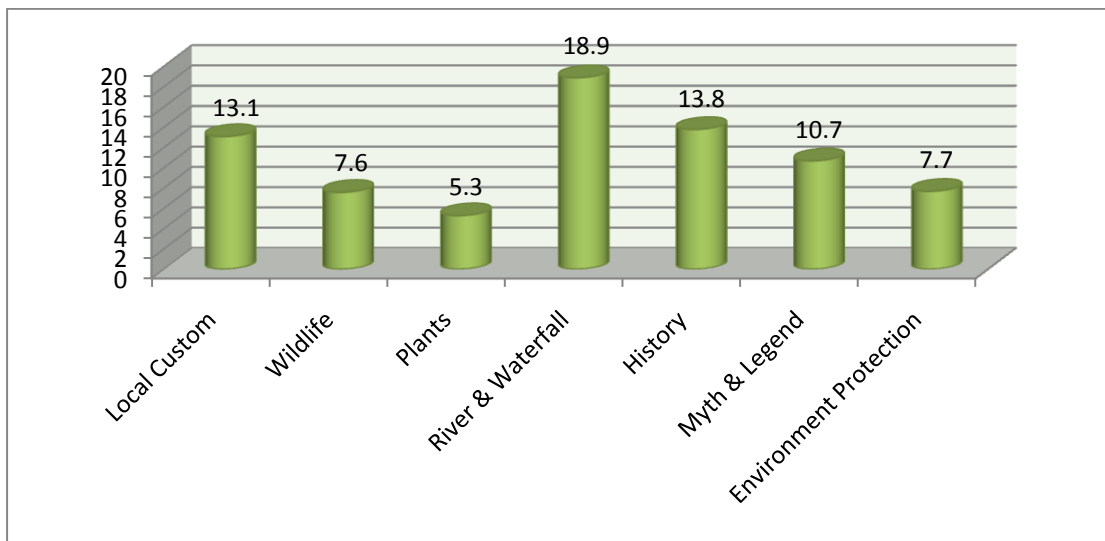
Personal interpretation (44.3%) was the visitors' favorite. Second, visitors chose the guide brochure (19.9%) and third the visitors chose wayside exhibits (15.8%).

Because of the time limit of their visits, most of the visitors like the direct and active interpretive methods. On the one hand, the Geopark management can take personal interpretation and wayside exhibits as the important programs to improve, on the other hand, more research should be conducted on the areas that scored low.

## Preference of Interpretive Themes

On the questionnaire, visitors indicated that they preferred the first five interpretive themes. Those five themes include: Geological knowledge (22.9%); rivers and waterfalls (18.9%); local history (13.8%); local custom (13.1%); myth and legend (10.7%) (Figure 5.40).

Figure 5.40 Preference of Interpretive Themes



We can see that the visitors are most interested in nature and geological landscape. Because of this, the management of the Geopark should increase information about nature and the geological landscape through multi-interpretive methods. Management should continue the dissemination of information on the natural sciences, myths and legends because these topics bring joy to the visitors and increased knowledge about their environment. A balance must be kept between science and myths and legends.

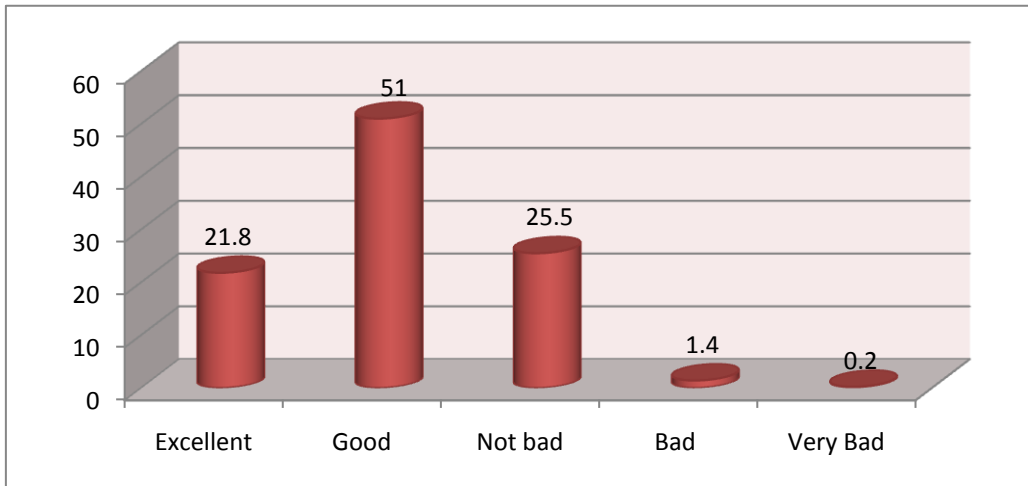
### 5.2.5 Comprehensive Evaluation

In the analysis of the environmental interpretation service, the satisfaction level was high. Fifty one percent (51%) of the visitors rated the environmental



interpretation services good, 25.5% of the visitors rated the environmental interpretation service not bad, and 21.8% of the visitors rated the environmental interpretation service excellent (Figure 5.41).

Figure 5.41 Comprehensive Evaluation



### 5.2.6 Suggestions from Visitors

In the questionnaire, the last question was open-ended and asked visitors to give suggestions about the improvement of environmental interpretation in Yuntaishan Geopark. Two hundred and twenty six (226) visitors responded to this question. Their answers are summarized below:

- Because of the varied interest of the visitors, it was suggested that within the park there be a wide variety of activities related to geology, plants, wildlife, etc.
- About the personal interpretation, visitors suggested that interpreters receive more training in content and professionalism, and that they have more interaction with the visitors. Visitors suggested that interpreters should consider different requests, and be able to provide information for diverse populations.

- About the wayside exhibits, visitors suggested that panels be added and the translation of foreign languages should be revised and improved. The relative distance to the scenic spots should be added to the panels.
- About the multimedia, visitors suggested that it should be increased and that the screens in the shuttle buses were too small and the content was too simple.
- Interpretive methods should be more flexible. For example, questions could be placed on the panels and answered at various times or places.
- About the interpretive content, the visitors wanted to learn more about local geological characteristics. Visitors would like to know the formation and evolution of the geology of the park. Second, visitors wanted more information about environmental protection and asked that additional activities be provided on environmental education. Third, safety should be increased and emphasized.
- About the trails, some visitors thought some trails were too long and that some trails should be designed to meet the needs of diverse populations.

### **5.3 Expert and Peer Evaluation**

A pilot was conducted using expert and peer evaluation of the questionnaire that was distributed by park managers. The pilot was conducted at the International Forum on Geoparks: Interpretation and Sustainable Development that was held at Yuntaishan World Geopark, Xiuwu County, Henan Province from October 11 to 14, 2007.

#### **5.3.1 Introduction of International Forum on Geoparks**

International Forum on Geoparks: Interpretation and Sustainable Development was held at Yuntaishan World Geopark, Xiuwu County, Henan Province

from October 11-14, 2007. The theme of the Forum was to promote research about interpretation and sustainable development in Geoparks. In addition, this was a platform on which to share information and experiences on interpretation systems and sustainable development of Geoparks; to identify major challenges about interpretation and sustainable development that Geoparks are facing and ways to overcome such challenges; to facilitate communication and networking among geographers and educators about Geoparks; and to raise public awareness on interpretation and sustainable development in Geoparks.

The Forum was co-organized by the College of Geography, Beijing Normal University and Xiuwu County government. Organization of the Forum was handled by the Environment & Heritage Interpretation Center of Beijing Normal University and Yuntanshan World Geopark Authority. The Forum also received support from the International Geographical Union (IGU), the Geographical Society of China (GSC), the University of Missouri -St. Louis, the National Association for Interpretation (NAI), the Grand Canyon National Park, USA.

Thirty-three (33) foreign experts from 6 countries participated in the Forum. For example, participants included the President of IGU, Prof. Dr. Jose Luis Palacio-Prieto (Mexico); the Vice President of IGU, Prof. Dr. Ronald Francis Abler (USA); the Vice President of IGU, Prof. Dr. Hiroshi Tanabe (Japan); the Vice President of IGU, Prof. Dr. Lindisizwe M. Magi (South Africa); the Secretary General of IGU, Prof. Dr. Woo-ik Yu (South Korea); the Executive Director of the America National Association for Interpretation, Dr. Tim Merriman; the Vice Executive Director of the America National Association for Interpretation, Ms. Lisa Brochu; the Vice President of IGU, Prof. Dr. Liu Changming; the Vice President of Geographical Society of China, Prof. Dr. Qin Dahe; Prof. Dr. Cui Zhijiu from Peking University; the governor

of Xiuwu County, Wei Fengshou. Prof. Wang Min chaired the keynote speeches.

Table 5.8 shows the list of the participants of the Forum.

During the conference experts visited the Red Rock Gorge, Zhi Fang Lake, Tanpo Valley, Macaque Valley, Zhu Yu Peak, Die Cai Holes, and Qing Long Valley. They appreciated the beautiful landscape and its good administration. The experts were given the opportunity to put forward comments and suggestions about the interpretation system of Yuntaishan Geopark

Table 5.8 List of the Foreign Participants of International Forum on Geoparks

Name	Title	Country
José Palacio-Prieto	President of International Geographical Union (IGU)	Mexico
Ronald Abler	Vice president of International Geographical Union (IGU)	USA
Woo-ik Yu	Secretary of International Geographical Union (IGU)	Korea
Hiroshi Tanabe	Vice President of International Geographical Union (IGU, Professor of Tokyo University)	Japan
Lindisizwe Magi	Vice President of International Geographical Union (IGU)	South Africa
Tim Merriman	Executive Director of National Association for Interpretation (NAI), CIP, CIT	USA
Lisa Brochu	Vice Executive Director of National Association for Interpretation (NAI), CIP, CIT	USA
Chris Mayer	Vice President of NAI, Researcher of NPS	USA
Donna Richardson	Director of Interpretation Department of Lowell Historical Heritage Site, Vice President of NAI	USA
Jim Covell	Director of Interpretation and Education Department of Monterey Bay Aquarium	USA
Christine Revelas	Region 9 President of NAI	USA
Mike Whatley	Natural Resources Program Manager of Education Center Office of NPS	USA
Amy Lethbridge	Vice Director of Mountain Area Recreation and Protection Bureau in California	USA
Robin Gyorgyfalvy	Director of Science Program of US Forestry Service	USA
Tom Christensen	Management Analyst of Information Resources Department of US Forestry Service	USA

Carole Murphy	Professor of University of Missouri-St. Louis	USA
Lloyd Richardson	Curator Professor of University of Missouri-St. Louis	USA
Brad L. Wallis	Executive Director of Grand Canyon Association	USA
Theresa G. Coble	Associate Professor of Stephen F. Austin University	USA
Elizabeth R. Barrie	Researcher of Indiana University	USA
John H. Jameson	Vice President of Interpretation and Policy Committee of ICOMOS	USA
Judy Bryan	Director of Interpretation and Education Department of Grand Canyon National Park	USA
Martha Hahn	Director of Science Center of Grand Canyon National park	USA
Dr Thandi Nzama	Senior Lecturer of Zululand University	South Africa
Martin Gyorgyalvy	President of Tye Engineer Investigation Co.	USA
Duane Fast	Vice President of Canada Theme Park Association	Canada
Gregory A. Bryan	Manager of Best Western Squire Inn of Grand Canyon National Park	USA
James H. Wilson	Endowed Professor of University of Missouri-St. Louis	USA

### 5.3.2 Evaluation from Experts and Peers

On October 14, 2007, after their visited to the main scenic spots, the experts attended a workshop in which they were given the opportunity to evaluate the environmental interpretation of Yuntaishan Geopark. The 26 experts and peers were asked to answer a questionnaire (Appendix C). Twenty (20) of the questionnaires were usable. This study makes use of the data collected by Yuntaishan Geopark and the evaluation conducted by expert and peers. The following summarizes the information.

#### Expert No.1

1. We appreciated the warmth and careful attention of our tour guides and all the park staff. The signs which provided engraved calligraphy with English translation that named key scenic spots were beautiful. The music that played on the loud speakers helped to set the mood for our visits.

2. The information that is provided on the signs along the Red Rock Valley trail and in the geological museum is very detailed and scientifically complete; however the signs could be improved through the application of some key interpretive techniques, including – thematic interpretation, use of “universal concepts” to increase personal relevance, etc.
3. Could you include quotes from famous poets to provide opportunities for visitors to feel an emotional connection to this place and/or China’s secluded mountainous regions? For example, we see Wang Wei’s statue – could we also see some of his poems?
4. Can you develop a management plan to address the effects of clouding on the visitor experience? (There is a large literature on the management of crowding in public lands/national parks in the US)
5. It would be very enjoyable to learn more about the rhesus monkeys – their physical adaptations for living in their environment/habitat, their behavior, their life cycle, etc.
6. It would be wonderful to hear interpretive program(s) about the Daoist temple on the peak and the history of Daoism in China.
7. It was very interested to learn more about the aquatic and riparian ecosystem of the valley. We saw spiders, frogs, waterbugs, beetles, butterflies, frogs, etc. We noticed beautiful plants and flowers. We wondered why we didn’t see any fish? We would love to know more about the flow of water through the park – where it comes from, where it goes, how the river system changes from season to season, how pure the water is – is it the purest water in China, etc.

### Expert No.2

1. Excellent staff, good use of technology, interpretive display in geology
2. Area were made it difficult to
3. I left the area
4. Very
5. Money habitat should be improved rather than metal cage. Trained monkey
6. Beautiful resource, good interpretation.
7. Highlight of , great resource.

### Expert No.3

1. Visitors are directed in an orderly manner with good planning for crowd control. Interpretation for geology were acceptable to good-model of park at visitor center.
2. - Not enough interpretation about variety of resources at the park.
  - No interpretation of cultural history or archaeology of the park or region
  - No interpretation brochures at gateway/visitor center.
  - Monkey Valley should not have animal caged or as “circus act.”
3. - More introductions at beginning of the trail for variety of resources and cultural history of the area.
  - Cross training of staff and guider or the nature of history of human use would help visitors understand significance of resources.
  - Need comprehensive Interpretive Plan for geopark.
  - The USA National Park Service can give guidance on effective training courses that will be helpful to improve the interpretation.

4. - Would like to see more interpretation about cultural history of the area.
  - Training of staff and guider would help improve quality of interpretation.
5. - Would like to see more demonstration of monkeys in the wild.
  - Training of staff and guider would help improve quality of interpretations.
6. Same as above
7. Same as above

#### Expert No.4

1. The staff. They were great in interfacing with the public. The guiders were thoughtful, caring, and personable. The park was well maintained and very clean.
2. There was not enough info about what I was seeing. Must accommodate all countries in the interpretive services. Need interpretative brochure, simplified map.
3. See Q6
4. Very good Tai Chi demonstration. Could use more demonstration on cultural activities and have more educational materials on those.
5. I did not enjoy this actually because I felt the monkeys were abused. I would have preferred to see the monkey in the wild.
6. Extremely difficult climb, but were worth it. Signs were good.
7. More written info on plants.

#### Expert No.5

1. Excellent trails in Red Rock Valley and Qinglong Valley with clean facilities and good directional signs. Trails are clean and free of



inappropriate signs and technology and that is very good.

2. The Geological Museum exhibits are very technical and designed for scientists. They do not create opportunities for guests to learn and understand these wonderful resources. But, they can easily be improved to be effective. Making these more easy to read and understand will be important.
3. Your tour guides are excellent as caretakers of people with thematic interpretive training. They will become much more effective at delivery enduring conservation messages and the planned themes of the site.
4. This beautiful valley is so powerful an experience. It is important to find ways to reduce the crowds on busy days to allow more enjoyment.
5. The wild and free monkeys are most fascinating and better signs and guided services will enhance the guest's understanding of these fascinating animals. The caged monkeys are most prominent and maybe less interesting as "zoo" exhibits found in cities.
6. This very steep climb is most challenging. Some sign or media should explain the difficulty to prepare people for the experience.
7. This valley and the trail are spectacular. Signage that helps people understand the thematic messages will be helpful. A comprehensive interpretative plan will help you accomplish this. Concession items should be more typical and educational – not common items sold other places. Bird life is very evident and interesting with proper interpretation, it will attract many westerners.

#### Expert No.6

1. The general explanation and provision of information with regard to Yuntaishan World Geopark. The friendliness and professionalism displayed by staff as a whole and eagerness to find out information where they were interested about park feature.
2. The crowd control or crowd management could be handled better in some sections of the park. It would be most ideal to institute crowd management technique which would not scare away tourists that are sensitive to a catastrophic situation.
3. A more universal approval toward using/embracing foreign languages as an interpretive tool. Encouraging basic usage of English by most officials and front-line staff.
4. The intuition of English related language interpretative approaches would improve the understanding of facilities and activities.
5. Did not visit this section
6. Visitor management techniques ought to be put into place and practiced so as to make tourists or visitors feeling comfortable. Tourists are known to be claustrophobism sensitive and this ought to be avoided.
7. This is a pleasant place, well constructed and managed to the super degree. What would enhance its interpretive services is further training of its officials and front-line staff. Some descriptions of features were not correctly written in term of language.

#### Expert No.7

1. Lots of opportunities to experience the outdoor resources. Also lots of information provided at visitor center and museum. Visual displays of the

park are very informative.

2. I would like to “feel” more of the park’s resources, such as having the opportunity to see wildlife in the wild rather than a “show.” Also, it would be great to understand the ecological system and how that was evolved from the geological system.
3. This comment applies to any area where you have a high-volume of visitors: work to manage your tour groups so they are separated by at least a 5-10 min spacing as they flow through the park.
4. Same as previous answer
5. I believe that the “show” put on with the monkeys seemed out of place for the theme of the park. The park has a “wildness” to it and being able to view monkeys in the wild would be more appropriate.
6. What a wonderfully pleasant place. It would be good to have interpreters present to speak about the meaning of place utilize a “living history” experience.
7. Allow the environment to speak for itself (maintain the quiet features). Also, relate more to the area’s history and what has happened there and how the story of place sets the stage for understanding the present.

#### Expert No.8

1. I enjoyed our guides very much. They were polite, friendly, and knowledgeable. The names of the places were very evocative. The signs were very attractive. The model (map) in the visitor center was great. The landscape design was excellent in that the signs and buildings created a feeling that was integrated and from “china”.

2. Geo Museum → many of the signs had too much text. A good rule is 50 words or less. The monkey valley was not interpretation. I wish to learn more about the monkeys and their habitat.
3. Explain more about water and its role in forming the valley. Create smaller spaces for people to sit and meditate and escape the crowds.  
Remember with signs - Rule of 3-30-3.  
3 seconds to call me attention (visually)  
30 seconds to explain with text  
3 minutes for a guide to explain with more detail.
4. No response
5. Create a natural habitat for monkeys and meet their needs. Eliminate the “show” or put off to one side. This show was popular, but not educational.
6. I very much enjoyed the visit. I enjoyed meeting the priests (monks) – I would enjoy more explanation of spirituality and the history of the places.
7. I would like to learn more about the local people, legends or origins behind the romantic place names. I enjoyed the music on the cable car rides.  
The Bus is a great opportunity for delivering short but powerful messages via video/guides.  
The park is not just geologies – it is natural (flora and fauna) cultural (local people, history of people on land, legends, etc) – use it all to create rich experience – living history, demonstrations, exhibits.
  - Be careful of visual pollution – cellular towers, etc.
  - Plan for visitor experience from arrival to exit. Plan what messages and stories need to be told.
  - Invest in staff professional development

- Language training
- Park and protected area management
- Interpretive training
- Marketing
- Communication

Great park. Great experience. Work hard and you will have continued success.

#### Expert No.9

1. Enjoyed the guides; enjoyed very much the opportunity to view the valleys without a lot of interpretation...some, well done, some is good, but too much emphasis on “educating” visitors would diminish the experience for most visitors. Instead, focus on conservation messages rather than topical areas, and make what you have more effective by establishing clear objectives; Trail system very well laid out
2. Need more advance information (length of trail, number of stairs, difficulty of trail); Monkey valley was not a good experience – wild monkeys out of cages expected, not caged unhappy monkeys or trained monkey show.
3. See #1. Very important: complete a comprehensive interpretative plan before doing anything else, make sure you understand what you want interpretation to accomplish and who is for before investing resources (staff, budget, etc.) to develop and implement interpretive media.
4. Did not visit – or if we did, I did not realize this was where we were.
5. Eliminate caged monkeys (cages) and trained monkey show; instead, provide safe habitat areas (similar to panda reserve in Wolong, but monkey

proof) so that visitor can view monkeys without worrying over the monkeys' health and well being.

6. Could not get up stairs; sales shops in front of parking area had very little to do with the site – sales should reflect the theme of the site.
7. Keep it simple – this is a very special place and should be experienced, not necessarily explained in detail; remove signs from photo opportunities (hard to take photos with signs in the way)

#### Expert No.10

1. Interpretative staff were very friendly, has good background, good English skills. They provided interesting facts and stories, answered questions well. Outdoor interpretive signs could benefit from more graphics and photos.
2. I would like to see more stories about the history of the park. The rock formations, or other local stories.
3. Would like to see story of how gorge was formed (using graphic images as much as possible)
4. No response
5. Western audiences would prefer to see monkeys perform more natural behaviors and less tricks (during the show)
6. For western audiences – more background or stories about the objects and architecture of the temple to make experience more meaningful
7. The stream and waterfalls are such prominent features. I would like to see some poetry or verse related to this water feature. Also, story/graphic to show how some geologic features were formed.

Expert No.11

1. Extremely knowledgeable staff, very friendly and welcoming. Directional signage very well done, railings and walkways well developed and well integrated into the environment, visitor needs (rest rooms, trash cans, sale of goods) well planned out. Signs were well designed and fit into the environment, but could include more information.
2. Need to develop a park brochure to help visitors understand the geologic story, as well as the story of the people who have lived in the area. In addition, more information on the specific sites and a good park wide map. Also, at key spots such as visitor gathering points, more interpretive signage to introduce the area and its story, but minimize signage along trails.
3. Interpretive park map with overview of area, interpretive signage at key gathering areas such as the beginning of trails, outside restrooms. Availability of additional materials available for sale to allow visitors the opportunity to bring materials home to continue learning and enjoying your wonderful park.
4. Same as previous – park brochure, interpretive signage at key gathering points, resource materials for sale to bring story home. Provide opportunities for visitors to connect to the local people and learn about local culture through demonstrations of crafts, farming, etc. connect visitors with long cultural history of valley and its people. Also, provide interpretation of local plants and animals.
5. Reduce or eliminate monkey show. If important to park separate it from monkey valley, possibly create a facility near parking lot to house captive

monkeys and provide shows. Allow monkey valley to remain wild and visitor experience to be more connected to the natural resource. Provide information on Taihang Monkey, their species, habitat, etc.

6. Same as above – park brochure, interpretive signage and resources to bring away. In addition provide interpretation of Zhuyu Temple. Place this sign before last long staircase up to temple at a resting area so not to intrude on temple setting, but help visitors understand what they will see and experience.
7. Same as above – park brochure, interpretive signage etc. Here, you have driven a long distance to reach this site, signage and landscaping to provide sense of arrival to the valley. On cable cars you might provide short interpretive sign/message as to what visitors see as they are “captive” audience. More interpretation of people who live in the valley past and present. Possibly create opportunity for demonstrations of crafts, explanation of farming the valley and more. Include the children so they grow up valuing this wonderful resource in which they live. Yuntaishan world Geopark is at a wonderful place to think strongly about interpretation. The infrastructure is well done such as roads, parking lots, trails, restrooms, etc. and it’s now time to think about who is the audience who are coming as well as those you would like to attract. It’s a perfect time now to think about park wide goals and what you want to focus on. A well developed interpretive plan will help you set these goals, short term and long term, and then identify the ways to best meet these goals over time. It will provide numerous suggestions to help reach park visitors that include personal and non-personal interpretation, and be prioritized. Also,



this plan will identify training needs for staff at all levels from management, to interpreters, to sweepers or caretakers that will help them improve the visitor experience. You have a very professional staff who can become even better interpreters with good interpretative training such as what National Association for Interpretation provides. Continue to work with the Universities for research, interpretive development, and future scholarly interpreters.

Expert No.12

1. It was a very large impression. This size of the parking area was huge. The fleet of buses was impressive. There was a great deal of information to learn and digest about the formation of the landforms and rocks themselves. It was interesting and friendly and safe experience.
2. Lack of information about cultural and natural history (plants and animals) for your guests.
3. It was very crowded, but everyone seemed very happy with the beauty of the park and people waited for others to take photos and move along.
4. Additional signage or on site interpreters would add to the interpretive messages which can help you teach the conservation ethic to the Chinese and international guests.
5. I enjoyed seeing the wild monkeys. I would not keep monkeys in cages at all, just allow them to remain free.
6. This walk was very difficult for many people. It is very light steep. Perhaps a people mover on lift would serve your guests well.
7. Signage in more languages. It was the most beautiful and transportation was well used.

### Expert No.13

1. The interpretive service at Yuntaishan world geopark was very welcoming and very informative. The welcome sign and message at the entry gate was very inviting. First of all, the overall view of the physical layout of the park gave you an idea of what to expect and the possibilities of where to visit with such a vast spectrum of choices. The initial orientation should give the main messages for conservation and sustainable development.
2. Visitor center was overwhelming. Perhaps more personal interpretation at the visitor center would be a way to focus visitors in a more friendly way and less institutionalized.
3. Possibly controlling numbers of people visiting at once. Perhaps a pause between large groups.
4. Very orchestrated and not much of a sequential visitor experience or thought given to sense of discovery in a natural setting. Very organized already so please do not do an overkill through media, etc.
5. Monkey valley seemed more for entertainment than interpretation. Perhaps interpretation of what vegetation is important for their habitat. What are their habits, how are they important to the ecosystem?
6. Zhuyu peak was a wonderful place to visit. The highlight for me was the temple at the top and the welcome from the priest. Meeting someone traditionally and spiritually connected to park made my visit much more special and meaningful.
7. Explanation by personal interpretation about the geology vegetation, ecosystems, wild life, etc. human history, cultural traditions and connections to the land by the people who have lived and now live there.

Viewpoints – explanation of significance of view especially if the view is not evident due to clouds of misty conditions.

Expert No.14

1. The design of the signs, etched into rocks, is very beautiful. The location of the signs was also very nice. The park staff were absolutely phenomenal, kind, helpful, friendly.
2. There were too many geology facts provided in the interpretation. An understanding of the human dimension of the park (aboriginal, recent past and current history) would be wonderful.
3. I feel it is important to help people understand the personal relevance of the resource through interpretation. Interpretation should help people understand why they should care about the preservation of the park. At a park level it would be wonderful to have a theme or a few themes for all of the interpretation, something that unites the various interpretive efforts. It would be nice to have the cohesive development of a relevant idea in each interpretive effort.
4. It was very crowded on the trails which made it difficult to notice any interpretation. The museum had only geological information with little material for people that are not interested in geology facts.
5. I am not accustomed to seeing animal shows and caged animals in natural parks. Animals in the US National Parks roam free. I felt sorry for the animals that had to perform and the others that were caged. But it was exciting to see monkeys roaming free.
6. It would have been wonderful to learn about why the temple was there and what the people who use the temple believe. How are their beliefs similar

to mine? How are they different? What struggles did they have to make the temple?

7. Including the human history in the interpretation would be of interest to many people. Some people did not enjoy the music on the cable car. This is a most amazing park. The trails are well designed and very safe. The park is so clean. The roads are built well and well maintained. The staff is the definition of professional. I am honored to have had the opportunity to visit this beautiful park. Thank you sincerely for your hospitality.

Expert No.15

1. Cleanliness of facilities; friendly staff; high level of maintenance; suggest a visitor survey study shared among all geopark to determine customer demand and comments.
2. Air pollution in the area near the park
3. More history of the area presented at the visitor center for all – increase the dramatic level of interpretation to match the drama of the land.
4. Would like to see more historic information
5. One live free roaming monkey is more interesting to foreign tourists than caged animals; offer some sort of free roaming experience
6. Excellent experience; interpretive stations along the route up to temple peak would be helpful
7. Remove the song speaker from the tram way experience.

Expert No.16

1. They are great tour guides, but they were mostly operating toward crowd, not enjoying a lot in interpretive depth

2. I wasn't given much to help me know what to expect before I went onto the area. I had to spend a lot of work and time before I really knew what I was going to see.
3. Consider developing a thematic message for the area and find a concise way to deliver the message to as many of the visitors as possible. Perhaps that will only be to appreciate the geology and the water and the scenery.
4. Tell people what they are going to see and why they should care. Objectives should be written for cognitive, affective and behavioral aspects. Consider what message you want to present in these valleys. Imax film was great! Keep it.
5. Consider what messages you are sending to visitors about monkeys and about the valley. Is there anything you could tell them about? The needs of the monkeys? Monkey habitat? How wild monkeys go to the valley? What message does the monkey performance want to deliver to the visitor? Is that what you want to say?
6. Let people know up front how the climb is and how long it make take. Tell visitor what they are going to see and why they should come. Tell the story of why the monkeys are there, why that is important and a little bit of how they live.
7. This was a great experience for me. The flute music floating through the air during the cable car ride really sets the stage for the fantastic adventure of the valley tour. The valley is a photographic paradise and leads itself to meditation, reflection and creative activities. It is perhaps the most special place I have ever visited. Consider allowing access by permit to keep the number of visitors at any one time relatively low. Consider developing an

agricultural based experience at the village to introduce visitors to village life.

Expert No.17

1. Very beautiful parks; very well maintained; good crowd management; well organized
2. Not enough interpretive tablets to explain everything. Needed more information on things like plants, animals, human history, culture.
3. Interpretive tablets were only scientific information – not for overage people.
4. Interpretive tablets were very shiny and hard to read; there was much information about the park that was not on the tablets
5. There was very little interpretation at this site
6. The interpretation was very good
7. Needed tablets to explain what people are seeing

Expert No.18

1. The lyrical signs and the facilities (garbage cans/bathrooms/stairs) developed to fit into the park scenery. The warmth and enthusiasm of guides.
2. The geology museum information was so technical that it was for a limited audience. Regardless of subject content, interpretive information should be accessible to a broad audience, including a variety of education levels.
3. Prepare audience for physical aspects of trail.
4. No response.
5. Better care and cage for the monkeys varied experiences offered will spread out the visitors so they are not all on the trail of hike.

6. No response.
7. No response.

Expert No.19

1. Friendly attitude of the interpretive staff; their concern for the comfort and safety of visitors.
2. No dislike
3. Do not separate the museum from the park feature – ultimately the park should be its own feature.
4. No – and professionally done in every way
5. Focus the area on making it possible to see the monkeys in a natural setting.
6. None-very good in every respect
7. It would be good to illustrate the structure and process that have formed the valley.

Expert No.20

1. Beautiful landscape; friendly guide
2. Missing: 1) interpretation on history and culture of the region; 2) map on the site and vicinity. Don't destruct landscapes any more.
3. Interpretation should be extended to geography, vegetation and even to cultural world of the area.
4. Not much can be done when too much crowded.
5. Monkey show: primitive. Why monkey valley? Do monkeys live there as wild animals?
6. Please explain about Taoism, its philosophy and present situation.
7. Maybe the cable car service system could be improved, especially safety in taking on and getting off.

### 5.3.3 Analysis of Expert and Peer Evaluation

According to the responses of the experts above, their suggestions, based on their evaluations, focus on the following items.

#### (1) About the interpreters

The experts gave the interpreters high evaluations. Experts felt that the interpreters were knowledgeable about the park's geological formations and were enthusiastic about the information they were providing. The main criticism was that interpreters did not have specific themes or objectives. Having specific themes and objectives would make the interpretation more effective.

#### (2) About wayside exhibition

The experts felt that the informational panels were well designed and harmonious with the surrounding environment. They suggested that native English speaker help correct the English grammar and spelling on the panels. They also suggested additional pictures and photos on the panels and brought up the rule of 3-30-3. Three seconds to call attention (visually), 30 seconds to explain with text, and 3 minutes for a guide to explain with more details. In addition, they agreed with visitors that more information is needed on the length of the trails, number of the steps, difficulty of the tour, etc.

#### (3) Visitor Center

Experts felt that the visitor center was harmonious with the surrounding environment and very Chinese, and the information at the entrance attractive. More personal interpretation could be given at the visitor center and an effort made to try to



lessen the feeling of institutionalization and formalism. The visitor center should be made more friendly. The materials given at the beginning should contain more content about environmental protection and sustainable development.

#### (4) Geological Museum

The Geological Museum design is friendlier to scientist than the general public. The information is uninteresting, and does not do a good job of increasing the enjoyment and knowledge of the visitors. It should be more understandable and enjoyable.

#### (5) About Zhuyu Peak

It is very difficult to climb up to the Zhuyu peak and the steps are very steep. Information should be provided on the difficulty of the climb and alternatives given. The more background and stories that can be given about the Daoist temple, the more interesting it is for the visitors. So it is important to introduce some detailed information about the Temple, for example, what kind of religion it is, what is the belief, how the temple was formed, and why was it built here.

#### (6) About Macaque Valley

Experts thought that Macaque Valley (or monkey valley) was just for fun. There was no information delivery and no relationship to the mission of the park. In order to bring it into line with the mission of the Park, information could be given on why the valley is inhabited with macaque monkeys. Information could be given on the habits of the monkeys, their importance to the ecosystem and their lifestyle. A recommendation was made that the monkeys performances be placed in the parking lot rather than in the valley. This would allow the valley to be kept natural and would provide a safe habitat for the macaques.

### (7) About Qinglong Valley

More local culture and history about Qinglong Valley should be introduced. How the trail was developed, how the geological characteristics were formed, and information on the ecosystem would make the visit most enjoyable. Some of the experts suggested that the Valley be kept in its natural form so that visitors can experience this natural environment.

### **Expert Suggestions**

The following suggestions were made by the experts and peers regarding environmental interpretation in Yuntaishan Geopark:

First of all the park needs a comprehensive interpretive planning. A well developed interpretive plan will help to set goals, both short term and long term, and will help identify the ways to meet these goals over time. It will provide numerous suggestions to help park visitors enrich their personal experience.

The park needs to develop a park brochure to help visitors understand the geological story, as well as the story of the people who have lived in the area.

The park needs to provide opportunities for visitors to connect to the local people and learn about local culture through demonstrations of crafts, farming, etc.

Interpretation of local plants and animals would also add to the enjoyment of visitors. The park needs to create activities to help children understand their culture and environment so that they grow up valuing the wonderful resources in the park as well as in the country in which they live.

According to the research, Yuntaishan Geopark did a good job of its environmental interpretation in some areas. There should be more emphasis on educating visitors. The infrastructure is well done such as roads, parking lots, trails, restrooms, etc. However, more work needs to be done on understanding current park

visitors and potential park visitors. Presently the park does not have educational goals. It would enhance the enjoyment of the park if there were educational goals that could be shared with visitors. A well developed interpretive plan will help to set these goals, both short term and long term, and provide ways to meet these goals. The plan will also help to identify training needs for staff. The research also confirms that Yuntaishan Geopark has very professional staff who can become even better interpreters with good interpretative training. Yuntaishan Geopark should continue to work with the universities to improve their programs through research.

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## APPENDICES

Appendix A Part III of Applicant's self-evaluation form for National Geoparks seeking assistance of UNESCO to become member of the Global Network of National Geoparks

<b>III. Interpretation and Environmental Education</b>	<b>Marks available</b>	<b>Self Assessment</b>
<b>3.1 Research, information and education scientific activity within the territory</b>		
At least one scientific/academic institution working in the Applicant's area.	40	
At least one student final report (mapping etc.) in the Applicant's area per year	20	
At least one of PhD thesis on Applicant's area within the past three years	40	
At least five scientific or tourism focused academic papers from the work within the Applicant's area during last 5 years	40	
<b>Maximum Total</b>	<b>140</b>	
<b>3.2 Do you operate programs of environmental education in your Applicant area?</b>		
Does your permanent staff include specialists in environmental education, who undertake such work as their main role within your team.	50	
Do you operate at least one formal education programme (please outline the nature of the program (s))	30	
Do you contribute towards at least one formal education program developed by other organizations. (museums etc.)	20	
Personal and individual program offered to children visiting the Applicant's area	20	
Do you operate a special program for primary/elementary school classes?	20	
Do you operate a special program for secondary/high school classes?	20	
Do you operate a special program for university students?	20	
Are there any university camps/education centres in the Applicant's area	20	
<b>Maximum Total</b>	<b>200</b>	
<b>3.3. What kind of educational materials exist? (The SELF AWARDED total cannot exceed 120)</b>		
Have you developed new educational material for school classes?	20	
Films, video, slideshow etc.	20	
Interactive elements/ internet	20	
Different special exhibitions changing on a regular basis	20	
Special education equipment (puzzles, special constructions, etc)	20	
Do you produce other material for children below 8 years?	20	
<b>Maximum Total</b>	<b>120</b>	
<b>3.4 What kind of published information is available in your Applicant area?</b>		
Protection of geological heritage	15	
Geological history of the area	15	
Environmentally friendly behavior in the area	15	
Other aspects of natural history which can be found within the area	15	
Historical elements	10	
<b>Maximum Total</b>	<b>70</b>	
<b>3.5 What kind of professional marketing of the area takes place?</b>		
Printed material (e.g. leaflets, magazines)	25	
Popular literature for public (e.g. books, guide books)	15	
CD or video material	15	
Other promotional material or merchandise	15	
<b>Maximum Total</b>	<b>70</b>	

<b>3.6 In how many languages is the marketing material produced? (The SELF AWARDED total cannot exceed 80)</b>		
English	10	
French	10	
<i>Spanish</i>	10	
<i>Russian</i>	10	
<i>Chinese</i>	10	
<i>Arabic</i>	10	
Add 10 points for each other language. <b>GIVE DETAILS (Languages)</b>		
Multi-languages in one publication	10	
<b>Maximum Total</b>	<b>80</b>	
<b>3.7 Geology provision for school groups. For example, organized visits etc. (The SELF AWARDED total cannot exceed 90)</b>		
Guided tours by Applicant's staff or through a member organization	30	
Standard programs, regularly offered for all park visitors	10	
Limited group size (max. 30 persons per guide)	10	
Are alternatives available if tour impossible due to bad weather conditions?	10	
Do programs exist for different ages?	20	
Do special, scientific programs exist?	20	
Is teacher training offered in matters relating to the Applicant?	20	
<b>Maximum Total</b>	<b>90</b>	
<b>3.8 Education – Guides</b>		
At least one advisory expert who is a practicing geoscientist	10	
Do you have at least one expert providing guided visit that your organization has a role in developing?	20	
Personal guides	10	
Freelance guides whose training and / or program is supported by your organization	10	
Training courses	10	
<b>Maximum Total</b>	<b>60</b>	
<b>3.9 What kind of information do you provide to educational groups, which encourage them to visit your area?</b>		
Letters to schools and universities	20	
Applicant-brochure	20	
Press announcements (Newspapers, Radio, TV)	20	
Applicant newspaper or newsletter	20	
<b>Maximum Total</b>	<b>80</b>	
<b>3.10 Do you use the internet for school programmes? What kind of service do you provide?</b>		
Own website with general information about environmental education within the area	40	
Those responsible for the education programme may be reached by E-Mail	20	
Regular electronic newsletter	15	
Up to date calendar of activities	15	
<b>Maximum Total</b>	<b>90</b>	

## Appendix B Visitor Questionnaire

**Dear Visitors:**

We are working on the research of interpretation service in Yuntaishan World Geopark. Your answers to the following questions will help in the evaluation of environmental interpretation and will enhance the quality of future interpretive programs at Yuntaishan World Geopark. Please be honest to each question. All of your answers will be absolutely confidential and your cooperation in this research will be highly appreciated.

**1. How did you find out Yuntaishan World Geopark? From(check all that apply)**

- ① A Friend/Relative            ② Travel Agency/Tour Group  
 ③ Books or other publication    ④ TV or other mass media  
 ⑤ Internet                        ⑥ Others: (be specific)

**2. This is my \_\_\_ time to come here and I will stay for about \_\_\_ days.**

**3. Who did you come with today?(check all that apply)**

- ① By Myself            ② School Group        ③ Friends  
 ④ Tour Group            ⑤ Other Family        ⑥ Members Business Associates  
 ⑦ Others:(Be Specific)

**4. What kind of transportation brought you here? (check all that apply)**

- ① Car                        ② Motorbike            ③ Public Bus  
 ④ Tour Bus                ⑤ Taxi                    ⑥ Hiking/Walking  
 ⑦ Bicycle                 ⑧ Others:(Be Specific)

**5. What kind of interpretive services did you prefer most to receive at Yuntaishan World Geopark?**

- ① Interpretive Signs/Labels        ② Interpretive Brochures/Pamphlets  
 ③ Publications Exhibits            ④ Interpreters  
 ⑤ Multimedia/Audio Device        ⑥ Others:(Be Specific)

**6. What kind of interpretive subjects do you prefer to learn about at Yuntaishan World Geopark?**

- ① Geology                ② Insects/Butterflies        ③ Wildlife Birds  
 ④ Aboriginal Culture    ⑤ Park History Plants        ⑥ Others:(Be Specific)

**7. Please check the interpretive service for each of the following scenic spots.**

Scenic spots	Did not Visit	Poor	Acceptable	Good	Very Good
Red Rock Valley					
Zifang Lake					
Diecai Cave					
Zhuyu Peak					
Quanpu Valley					
Tanpu Valley					
Geological Museum					
Baijia Rock					
Monkey Valley					
Wanshan Temple					
Qinglong Valley					

8. What was your main purpose for coming to Yuntaishan World Geopark?

9. What did you like most about your visit to Yuntaishan World Geopark?

10. What did you like least about your visit to Yuntaishan World Geopark?

11. Do you have any suggestion about the interpretive service in Yuntaishan World Geopark?

12. Sex  Male  Female

13. Age  Under13  13-18  19-25  26-35  
 36-45  46-55  55-65  65 and up

14. Nationality

15. Education

Less than High School  High School Diploma  Some College  
 Bachelors Degree  Masters Degree  Doctoral Degree

16. What is your annual household income?(check one)

Under\$20,000  \$20,000-39,000  \$40,000-59,999  
 \$60,000-79,999  \$80,000-99,999  100,000and above

17. What is your occupation?

Business  Missionary  Retired  Unemployed  Student  Homemaker  
 Researchers  Government/Foreign Service  Others: (Be Specific)

18. Are you currently working(living) in China? .  Yes  No

19. If no, where is your current residence?

**Thank you taking the time to share the information with us. It will help us to serve you better in the future.**

### Appendix C Expert and Peer Questionnaire

**Dear Experts:**

Thank you for answering the following questions. Your comments and suggestions about the interpretation system in Yuntaishan World Geopark will help in the evaluation of interpretation and will enhance the quality of future interpretive programs at Yuntaishan World Geopark. Your cooperation and help will be highly appreciated.

Please check the interpretive service for each of the following scenic spots.

Scenic spots	Did not Visit	Poor	Acceptable	Good	Very Good
Red Rock Valley					
Zifang Lake					
Diecai Cave					
Zhuyu Peak					
Quanpu Valley					
Tanpu Valley					
Geological Museum					
Monkey Valley					
Qinglong Valley					

1. What did you like most about interpretive service in Yuntaishan World Geopark?
2. What did you like least about interpretive service in Yuntaishan World Geopark?
3. Do you have any suggestion about the interpretive service in Red Rock Valley?(visited on 12<sup>th</sup> Oct)
4. Do you have any suggestion about the interpretive service in Quanpu Valley and Tanpu Valley?(Visited on 13<sup>th</sup> Oct)
5. Do you have any suggestion about the interpretive service in Monkey Valley?(visited it on 13<sup>th</sup> Oct)
6. Do you have any suggestion about the interpretive service in Zhuyu Peak?(visited it on 13<sup>th</sup> Oct)
7. Do you have any suggestion about the interpretive service in Qinglong Valley?(Visited on 14<sup>th</sup> Oct)