

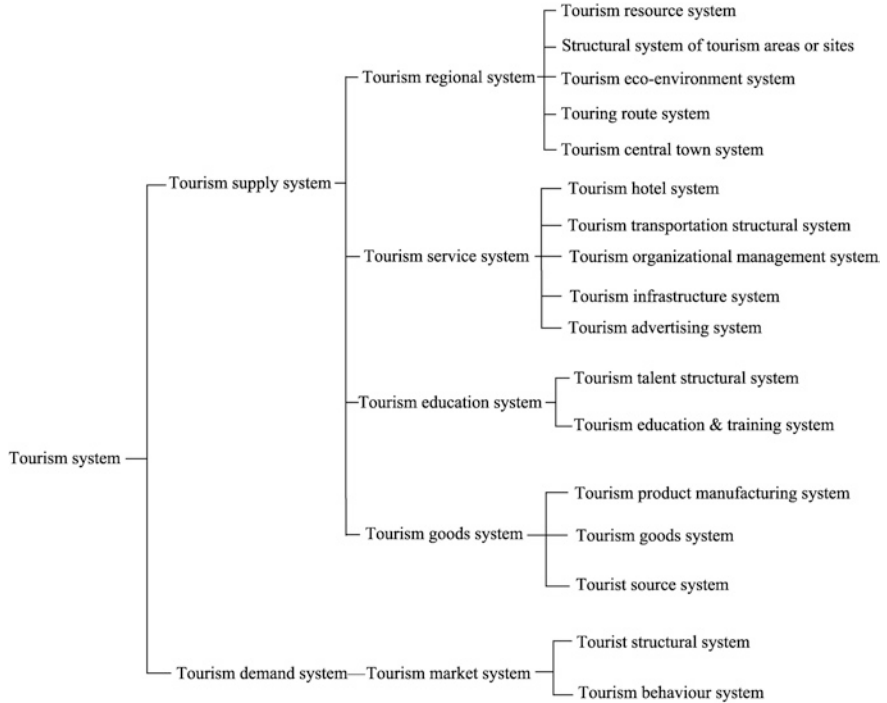
Chapter 2

Role of Tourism Earth-science in Tourism Development

2.1 Tourism Earth-science and Tourism System

2.1.1 Tourism System

Tourism is a huge social systematic project comprising tourism demand and supply systems and many subsystems, such as tourism regional system, tourism market system, tourism service system, tourism goods system and tourism education system. These parts, which are interdependent and infiltrate and constrain each other, constitute a complicated tourism architecture, as presented below:



By functions of tourism, the aforesaid systems can be merged into three aspects: subject, object and medium. The subject is the tourist, who is the leading actor of a tourism activity and without whom tourism will not happen; the object is the tourist site or scenic resource, which is the material basis for attracting tourists and without which tourists will not be stimulated or lured and tourist activities will not happen; the medium, also called bond, is the intermediate link between the subject and the object and serves to enhance the accessibility of tourism by means of service, so it is also indispensable to tourist activities. The aforesaid three aspects are the basic elements of tourism. They are interrelated, constrain each other and form an organic tourism complex. Tourism economics, tourism marketing, tourism management, tourism earth-science, tourism psychology, tourism literature, tourism aesthetics, tourism law, etc. under tourism science study this complex from different perspectives and objects. Therefore, tourism earth-science is not only an important component of tourism science, but also a branch of earth-science. It mainly studies some things and phenomena relating to earth-science, namely undertakes the earthscientific task of studying tourism complex and its systems.

2.1.2 Earthscientific Background of Tourism System

Tourism occurs in a certain spatial setting. All elements constituting tourism are inevitably merged into this spatial system, forming a tourism regional complex. Therefore, tourism system is pregnant with rich earthscientific characteristics. Also, because region (including the entire earth surface) is the basic stage of earthscientific research activities, only such an entity may help reveal the laws of many earthscientific phenomena that happen in this region. Tourism earth-science is a discipline which studies the relationship between tourism and geological and geographical environments. Therefore, all tourism events and phenomena in the region certainly have rich and profound earthscientific contents. Now, we will analyse the earthscientific characteristics of all elements constituting a tourism system.

2.1.2.1 Earthscientific Characteristics of the Subject of Tourism

The subject of tourism—tourist is the source of tourism demand and an important condition to enhance the recognition of tourism sites. Tourists start from their starting points, travel along specific touring routes by different means of transport to destination countries or destinations and then return to the starting points or go to other tourist areas, which constitute the whole process of the tourism market system. Each link has research contents of earth-science. For example, the excitation conditions of tourism are inseparable from the different natural and cultural environments of a tourist area. Those conditions may trigger in tourists' various tourism motivations linked to politics, economy, culture, history, aesthetics and psychology. The environmental conditions on the earth surface including climate, beaches, sunshine, topography, geology, water areas, living things can all induce tourists. Some visitors motivated by the desire for knowledge intend to study the scientific value of these conditions and to expand their visions of knowledge; some motivated by the desire for pleasure intend to appreciate natural beauty and express feelings by virtue of sceneries; some want physical exercise and mental relaxation in clean and quiet natural environment and fresh air; some seek variations from their living routines to meet their psychological need for adventure; and some hope to avoid bad weather in their hometowns and seek warmth and sunshine. We can see that all these different tourism motivations are closely related to certain environmental features of the earth surface. Tourism earth-science workers will certainly cover a lot of research contents of earth-science while they are studying these tourism causes and motivations.

The regional differences of tourist sources not only affect the travel motives of travellers but also determine the scale structures and geographic movement patterns of tourist flows. Research subjects of tourism earth-science are the trends of

tourist flows from cold areas to mild ones, from wet rainy areas to bright sunny ones, from hot plains to mountains and coastal summer resorts, from developed areas to developing zones, from the countryside to the city and from the city to the countryside. In a word, the difference of tourism regional conditions is a basic factor for the imbalanced time–space distribution and movement intensity of tourist flows and is an important condition for the alternation of high season, shoulder season and low season of tourism in various areas. Tourism earth-science workers have been diving into the characteristics of tourism seasons and tourist activities in various areas and the difference in use value of the same tourist site in different seasons, which is a compulsory research task of tourism earth-science.

The research and prediction of changes in tourist source markets also bear some relation to tourism earth-science. It is known to all that the distribution of tourist sources and the direction of tourist flows are affected by many environmental factors, with some of their changes directly determined by earthscientific environments. Therefore, if a certain factor attracting tourists changes, tourist source markets will show new trends and characteristics. Tourism earth-science studies such subtle market changes and is therefore very informative for tourism managers in making decisions to adjust economic policies and contents.

To sum up, the tourism market system includes many subsystems such as tourist source system, tourist structure system and tourism behaviour system, all of which contain rich research contents of tourism earth-science. Tourism earth-science studies these earthscientific factors and characteristics that restrain tourist source markets, which is undoubtedly of great significance for the development of tourism.

2.1.2.2 Earthscientific Background of the Object of Tourism

The object of tourism—tourism resources, which include many subsystems such as resource classification system, tourist site structure system, tourism eco-environment system, touring route system and tourism infrastructure system—is the basic material condition for the formation of tourism regional system through attracting travellers. These systems not only share common earthscientific background but also have unique structural characteristics, and therefore, they are the main study object of tourism earth-science and are of huge practical value for the overall development and economic growth of tourism regional system.

Tourism regional system is also known as tourism recreation system abroad. It is the general term for regional series with tourism functions. The basic characteristics of tourism regional system are as follows: (1) Spatiality: namely the system has corresponding spatial scope and definite boundary of attraction; (2) substantiveness: namely the system is a complex of a series of regions with tourism objects and tourism facilities; (3) hierarchy: namely the system contains several levels of recreational regions which interrelate and constrain each other, with high-level recreational regions restricting low-level recreational regions and low-level recreational regions forming part of high-level recreational regions;

(4) domination: namely there exists the difference in dominant tourism functions between each level of the tourism regional system and its adjacent levels. In other words, each tourism region in the tourism regional system has its own dominant functions and advantages, which makes it become a unique tourist site competing with its surrounding scenic areas. In a word, tourism regional system is a series complex of multifunctional, multi-level and multi-category tourist zones, areas, lines and spots with systematic characteristics. The said series complex mainly includes the following research contents: location factors for the formation and development of tourism regional system; unique functions of tourism regions; resource characteristics of tourism regions; economic development level and environmental conditions in tourism regions; distribution pattern of travel centre in all recreation regions; and facilities and organizations in tourism regions.

Tourism resource classification series is the basic element constituting tourism regional system. Tourism resources are a general term for natural and cultural resources which are attractive to tourists and have certain tourism functions and values. In other words, they are absorbing materials with certain tourism functions and values. It can be seen that tourism resources, regardless of natural landscapes such as mountains, water, climate, trees and flowers or cultural landscapes such as city walls, palaces, temples, gardens, tombs, ancient towers and modern architectures, are all scenic entities and phenomena distributed in certain regions. Their natures, types, sizes, grades, environments and factors are closely related to earth-science, and some things and phenomena are the basic research objects and contents of earth-science.

Structural series of tourist sites is an important part of the object of tourism. According to the functional system, economic structure and formal role of tourism supply and demand, this series is divided into many types such as landscape tourist sites, cultural tourist sites, historical tourist sites, ethnic tourist sites, modern engineering tourist sites, entertainment and recreation tourist sites and comprehensive tourist sites. Landscape tourist sites can be further divided into sightseeing tourist sites, summer tourist sites, winter tourist sites, spa tourist sites and sports tourist site. These different tourist sites have the following earthscientific characteristics: (1) They belong to a region of certain location and scope; (2) there are specific and exploited tourism resources distributed in the said region for sight-seeing; (3) the economic structure in the region is dominated by tourism, namely there are comprehensive tourism supply facilities and services. All these are the research contents of regional earth-science.

Tourism ecological series is also part of earth-science worth study in the object of tourism. Ecological series is a general term for all elements which constitute eco-environment. How many ecological elements are involved in a tourist area depends on its environment location. The ecological elements of city parks mainly include water, soil, atmosphere and biology; the ecological elements of nature reserves mainly include topography, water, soil, atmosphere and biology. A change in any of these ecological elements will have a certain impact on the whole eco-environment. Therefore, the beauty of environment is the product of the organic integration of various ecological elements. In order to protect the beauty

and pleasure of tourism environment, it is necessary to learn the rules of ecological changes in tourism environments from the perspective of earth-science so as to artificially maintain ecological balance and promote a virtuous circle of tourism environments, and give full play to the comprehensive effects of various factors such as natural resources background, secondary resources background, social and economic conditions and science and technology.

Touring route series is the artificial design engineering bound up with the elements of tourism earth-science and plays a critical role in the development of tourist areas or tourist sites. It is known to all that tourism is a kind of regional spatial movement of tourists from the departure place to the destination. This temporary movement to other places is restricted by various factors such as tourist areas (spots), economic status, traffic conditions, tourism markets and vacation time. However, all spatial movements for the purpose of sightseeing, recuperation and recreation require the selection of a certain route. Such a route should be economical, comfortable and multifunctional, featuring versatile and distinctive sightseeing contents; convenient accessibility for tourists to avoid roundabout and return; touring spots appropriately spaced to make tourist activities properly inter-valued and rhythmic; consideration of hot and cold spots to maintain the balance of tourist flows. It can be seen that the selection, planning and development of touring routes are also the major limiting factors and conditions of tourist activities. Tourism earth-science workers should put their professional theories and methods into practice to design more travel routes which are convenient, efficient, fast, safe, comfortable and economical.

In a word, the above series or systems are the basic research contents of the object of tourism. Their formation, structure, layout and range of action are all based on the theories of tourism earth-science. Comprehensive study on the object of tourism is indispensable to the development of tourism.

2.1.2.3 Earthscientific Characteristics of the Media of Tourism

The media of tourism, also known as the tie of tourism, includes a series of intermediate links such as tourism hotels, restaurants, transportation facilities, communication conditions, travel agencies, travel companies, tourism translation, guidance, publicity, insurances and laws. Its basic functions are reception, management and service. Different from the above subject and object, these items of media are all the artificial design systems serving tourists. The research on them is generally included in the domain of cultural research, but many aspects of them have to appeal to earth-science, or in other words, some research contents of them need to extend to the research field of earth-science. For example, with regard to site selection for hotels and restaurants in tourist sites, a series of geological and geographical factors like geographical location, geological foundation, environmental engineering and natural aesthetics are involved in many earthscientific issues and need to be studied. Geographical location is important; in that, it is related to the customer source effect of hotels and restaurants; geological

foundation should be solid in that it is related to the lifetime, safety and utilization of buildings; environmental engineering is the basic condition for hotels and restaurants because it is related to the investment scale, construction pace and impacts on surroundings of these buildings; natural aesthetics is an important indicator of environmental protection and the capacity, form and colour of buildings must be in harmony with the natural eco-environment.

Tourist transportation also includes many research subjects related to earth-science. The selection of type of tourist transportation, the construction conditions of transportation facilities (parking lot, cableway, etc.) as well as the requirements for the roadbed and road surface of tourist roads all need certification by professionals engaged in earth-science. Because the determination of transportation types such as railways, roads, helicopters and cableways entails scientific research on the corresponding location, geology, topography and environment. Otherwise, blind construction will lead to unexpected problems such as waste of investment, inadequate tourist sources, environmental destruction and hidden appendix-type risks. Site selection for parking lots and cableways should also be based on a review on earthscientific issues such as geological foundations, geomorphic conditions and environmental impacts. Moreover, roadbeds and road surfaces as well as directions and materials of walkways are directly related to environmental conditions such as lithology, structure, gradient and vegetation. It can be seen that the layout and building of transportation facilities need to be evaluated and certified by tourism earth-science workers.

And tourism publicity, guidance, translation and various drawings are also closely related to earth-science, because geology, geomorphology, water, climate and biology are not only the research objects of earth-science but also the landscapes directly appreciated by travellers. In order to make tourists rapidly and profoundly obtain the information of sceneries and enhance the attractiveness and recognition of them, it is necessary to disseminate the information through publicity, guidance and translation. It can be seen that the research contents of tourism earth-science are just the knowledge that should be acquired during these intermediate links.

2.2 Effects of Tourism Earth-science in Tourism Development

Like other tourism sciences, tourism earth-science promotes the development of tourism in various aspects. A few decades ago, some countries with developed modern tourism had noticed the pivotal position of tourism earth-science in the development of tourism and had conducted a special study on the scope and means of tourism earth-science so as to give full play to the tourism guidance function of this discipline. In 1939, Professor E.W. Gibbert, a British geographer, came

up with a theory of “the functional relationship between geographical factors and tourism growth”, and formulate this relation as follows:

$$F = f(x)$$

In the formula, x represents a variety of earthscientific factors: Geology (x_1), geography (x_2), resource (x_3), land use (x_4), climate (x_5), transportation (x_6)... It can be seen that the development of earthscientific factors is positively proportional to tourism growth. Years of experience further show the following effects of earth-science on tourism development.

2.2.1 Survey and Evaluation of Tourism Resources

Tourism, as a special lifestyle of residents, basically features leaving one's own residences for other places for temporary sightseeing, recuperation, holidaying and recreation so as to seek beauty, pleasure, knowledge and novelty as well as go shopping. Therefore, tourism resources are the basic material conditions for travellers' sightseeing and adventure. In order to find out the background and visual, scientific and historical values of tourism resources, it is necessary to survey and evaluate the distribution, characteristics, quantity, quality, origin and exploitation conditions of earthscientific tourism resources. As earthscientific tourism resources fall within the domain of earth-science and have earthscientific characteristics, only professionals acquainted with earth-science may penetrate into their nature and explore tourism functions and values through using earthscientific theories and methods. It can be seen that the survey and evaluation of regional landscape resources are one of the compulsory research tasks of geologists and geographers as well as the strategic work to provide material bases for tourism development. Through survey, observation and research, tourism earth-science workers can not only understand the characteristics, type, value, geology, geomorphy, climate, hydrology, vegetation, transportation and economic conditions of tourism resources, but also write the survey results into systematic reports and prepare various drawings by professional means. In recent years, many Chinese earth-science workers have written very featured reports and prepared sets of drawings about tourism resources, such as distribution maps of scenic spots and areas, classification and zoning maps of landscape resources, research and development maps of landscape resources and zoning and forecast maps of landscape resources. These textual and graphic results comprehensively reflect the general characteristics of tourism resources in a region or a scenic area and provide reliable scientific bases for overall regional development, planning and design.

The comprehensive evaluation of tourism resources is the central part of the research on tourism earth-science. This work is based on a general survey of the resources and a comprehensive evaluation report is basically required to be made on the abundance, quality, grade, composition characteristics, visual

value, cultural value, scientific value, environmental quality, exploitation conditions and comprehensive benefits of tourism resources through an analysis of adequate survey data. There are various types of evaluation, such as qualitative evaluation, quantitative evaluation, integrated evaluation from both qualitative and quantitative perspectives, demand evaluation, supply evaluation and the integrated evaluation with demand and supply combined. These evaluations are not only the basis for preparing the exploitation plan of tourism resources but also the primary means to improve the recognition of scenic spots. Such work is the incumbent research task of tourism earth-science.

2.2.2 Discovery and Selection of Scenic Development Zones

The development of tourism requires scientific combination and support of many scenic areas of different types, characteristics and functions, namely comprehensive scenic areas, as well as special scenic areas with major functions of sightseeing, scientific exploration, sports, recuperation, summering, display of historical cultures and ethnic customs, religious and ancestral pilgrimage. These scenic areas (spots) with different exploitation functions and values are needed by travellers of different countries, ages, sexes, occupations, educational levels, interests and preferences and are important conditions for improving the attractiveness and exploitation rate of tourism. Tourism earth-science workers ought to be good at discovering all kinds of scenic areas so as to serialize tourism development zones in a country or a region. Discovery of new scenic areas and spots is not only a prerequisite for the development of tourism resources but also an important task for further developing the new and old scenic areas already opened to the public. It is known to all that tourism is a business with heated competition. If a moderately developed old scenic area gets stuck in a rut and pays no attention to subsequent development, its tourist sources will be grabbed by tourist areas with richer resources, greater attraction and competitiveness. Therefore, all old and new scenic spots already opened to the public need to keep developing themselves by finding new and beautiful tourism resources. In recent years, many new scenic areas have been discovered nationwide such as Nine-village Valley, Huanglong Temple and Xingwen Stone Forest Cave in Sichuan; Manghe River and Mount Yawu in Henan; Tenglong Cave, White Horse Cave and Mount Gaolan in Hubei; Laoling, Wild Three Hills and Changli Golden Coast in Hebei; Yangma Island and Liangshan Cave in Shandong. These newly discovered scenic areas may support the tourism layout of various regions. Some scenic spots were isolated in the past, but a good touring route formed with newly discovered local and surrounding scenic sites have turned sluggish cold spots into profitable hot spots. Moreover, with the discovery of new attractions, some old scenic spots have given themselves a facelift by including more sightseeing contents, thereby attracting swarms of travellers from around the world. Mount Emei, a Buddhism shrine in Sichuan, is still deficient in supporting facilities of landscape resources in spite

of the existing extensive development. Afterwards, earthscientific scenic spots such as caves, structures, mineral springs and waterfalls were discovered through further exploration, which supported the intensive development of Mount Emei.

There are various ways to discover new tourism resources and select new scenic sites by using earthscientific knowledge and methods. For example, some new scenic spots can be explored and discovered by virtue of the clues provided by local chronicles, past travel notes, heritage information, public reporting of landscapes, extension rules of formation conditions of the existing scenic areas, zoning forecast report of tourism resources, as well as modern scientific means including satellite photography and aerial remote sensing. The unique contribution of tourism earth-science is undoubtedly ascribable to the perfect presentation of its strengths.

2.2.3 Precise and Rough Measurements of the Area and Quantity of Elements of Natural and Cultural Landscapes in Scenic Areas

A scenic area or sightseeing city is made up of different types of landscapes, geological and geographical elements. According to our survey data in recent years, there are at least 100 earthscientific landscape elements. Basic landscape elements include land surfaces, water areas, highlands, plains, plateaus, hills, basins, deserts, grasslands, woodlands and shoaly lands; geological and geomorphic elements of landscapes include stratigraphic sections, typical structures, fossils, earthquake relics, special mines, ancient mining sites, volcanoes, peak forests, caves and glaciers; meteorological and climatological elements of landscapes include sunlight, sky colours, heat, rain, fog, mirage and Buddha light; aqueous elements of landscapes include rivers, lakes, sea, springs, waterfalls, pools and rivulets; botanical and zoological elements of landscapes include forests, old trees, precious trees, flowers, green fields and ornamental animals; cultural elements of landscapes include cities, towns, countryside, factories, bridges, ports, as well as palaces, halls, buildings, pavilions, houses, alcoves, platforms, porches, pavilions on a terrace, monasteries, temples, tombs, pagodas, gardens, stone carvings, inscriptions, steles, couplets on pillars, murals, grottos, historical monuments and former dwellings of celebrities. These elements have different measurement requirements: Some require precision and some require estimation; some require a regular quantity and some require special measurement. Take plant species for example. In addition to the number of families, genera and species, it is better to list the statistics of dominant species, endemic species, rare species, protected species and ornamental species too. Such statistics are of great significance for understanding the tourist features and functions of some scenic area or nature reserve and are the fundamental basis for designing tourism facilities and the measures for protection of the ecosystem. For example, Mount Huangshan has

72 peaks, 24 springs, 20 pools, 16 rivulets, 14 caves, 3 waterfalls, 2 lakes, more than 2400 species of plants, nearly 100 species of fish and amphibians, more than 200 species of birds and animals, 14 species of animals under state protection; Maiji Scenic Area of Tianshui has 4 main landscapes, 18 small scenic areas, 24 independent scenic spots, 7 ancient sites, 194 grottos, more than 7200 statues and over 1000 m² of murals. In a word, such landscape statistics are the results of earthscientific researches by predecessors and are fundamental to a comprehensive understanding and evaluation of a scenic area. Earth-science as a comprehensive discipline can not only make scientific measurements of various earthscientific objects and phenomena through surveys but also make scientific “diagnoses” to identify the authenticity of the statistics so as to make the measurement of scenic elements more accurate and systematic.

2.2.4 Positioning, Qualitative and Quantitative Analyses of Intrinsic Attributes of Tourism Resources

Apart from external features and categories, some intrinsic attributes of landscape elements are the internal determinatives of landscapes and are essential for the development of sceneries. A scenic area not only gives sensuous enjoyment to tourists, but also enriches their knowledge. Only if external beauty is integrated with internal essence can we deeply understand the visual, scientific and cultural values of sceneries, thereby sublimating the appreciation and experience of such a beauty. For example, the external elements of karst scenic areas are just peak forests, stone columns, stone cones, stone buds, stone caves, solution caves, funnels, canyons, natural bridges and waterfalls. However, upon careful comparison, we may find that the karst scenic areas have different characteristics in the nature of sights, scale, shape and development stage. From the macroscopic perspective, their geological foundations are karst, but why are there differences in shape? It is necessary to do some positioning, qualitative and quantitative analyses on the changes in the combinations of karst components in various scenic areas.

Positioning refers to the environmental location of each type of landscape in the scenic area. This location is the result of the integrated action of various geographical factors of nature and is organically related to its surrounding environmental factors. For example, Beijing Cave of Stone Flower, which happens to be located at the south foot of Dashi River, has developed better than Cloud and Water Cave of Mount Shangfang in the south, and it is impossible to find such a solution cave in more southerly places like Juma River Basin and Shidu Scenic Spot. All these are related to the environmental location, indicating that the paleoenvironment of the Cave of Stone Flower was somewhat different from that of Cloud and Water Cave and Shidu Scenic Spot.

Qualitative analysis means the identification of the essential properties of landscapes. Every landscape has its specific scientific name. For example,

peak forest usually refers to a forest made up of limestones and its essential characteristic is dissolution process of carbonate rocks by acidic water containing carbon dioxide. However, there are some false peak forests which are formed by endogenic and exogenic geological processes, instead of the dissolution process, on other sedimentary rocks or intrusive rocks. It can be seen that different peak forests have various development factors. Peak forest is a unified form of landscape with different natures and properties. Earth-science workers have been endeavouring to make a scientific “diagnosis” of the essential attributes of peak forests since they have found that peak forests are similar in appearance but different in essence. For another example, cave landscapes are uniformly named as grotto from the perspective of appearance, but they vary greatly in the type of internal sights, spatial structure, scale and causes of formation. According to their formation mechanisms and lithology, they are generally classified as limestone cave, volcanic cave, granite cave and rhyolite cave. Solution cave and fluxing holes have specific meanings. The former is a karst-specific phenomenon, its lithological compositions must be carbonate rocks, and its formation mechanism is mainly corrosion as well as auxiliary gravitational collapse; while the latter is a phenomenon unique to volcanic lava, its lithological compositions must be extrusive rocks (like basalt) and the formation mechanism is mainly imbalanced condensation of lava and specific auxiliary conditions like underlying landform. It can be seen that qualitative research on caves must be based on special earth-scientific knowledge. Particularly, limestone caves have quite complicated types of landscapes. In respect of nature, there is cave geology, cave sediments, cave water, underground rivers, inside waterfalls, springs, hot mineral water, cave life, fossils, and outside geomorphy, hydrology, vegetation, etc.; in respect of culture, there are ancient buildings, stone inscriptions, stone carvings, wall writings, cave cultural sites, myths and legends. Therefore, survey and evaluation of caves is specialized work involving many research contents of earth-science such as exploring the trend and scale of solution caves, measuring the shapes, finding out the types, quantity and quality of shapes and studying the development conditions and value.

Quantitative analysis refers to the quantitative relationship of landscape components. Every landscape is inseparable from the interactive influences of solid, liquid and gas. Cave landscapes are mainly formed by solid rocks under the interaction of liquid water and air. Mechanical composition, contents of chemical elements, stratigraphic bedding, the trend and size of joint and fault lineaments of rocks all have a certain impact on the formation, scale and shape of solution caves. These items can be quantitatively analysed with modern scientific experimental methods.

2.2.5 Supervision and Protection of Tourism Resources and Their Ecological Environments

Environmental issue is one of the major strategic issues of the world today. The protection of human living environment has aroused widespread attention around

the world. The current massive environmental pollutions not only affect the survival of human beings, endanger animals and plants and lead to depletion of natural resources, but also pose a tremendous threat to tourism. Recent researches indicate that the development of tourism and environmental protection has been contradictory and interdependent in objectives. Beautiful environments are prerequisite to attracting travellers, so substantial development of tourism relies on landscape resources and their eco-environment. However, owing to the inherent characteristics of tourism, its development will more or less harm the healthy social and ecological environments and threaten the foundation that tourism itself depends on. It can be seen that the development of tourism can rapidly bring economic benefits from the perspective of single economic unit but it is detrimental to environmental protection; and conversely, the damage and spoiling of environments directly affect the sustainable development of tourism in the area. The contradictory and interdependent relationship between tourism development and environmental protection determines the duality of economic strategy research of tourism. That is, tourism benefits should be obtained through rational development, and protection of resources and environments should be strengthened so as to maintain stable and sustainable development of tourism. As mentioned earlier, tourism earth-science is a science which studies the relationship between human touring activities and geological and geographical environments, so it specially focuses on the protection and purification of tourism environments. In order to protect tourism resources and environments from destruction, tourism earth-science can study and monitor tourism environments from different perspectives. For example, how does tourism bring bad impacts to specific environments? How to determine the ecological capacity limit of different landscapes? What impacts will the destruction of social and ecological environments bring to tourism? What policies measures should be enacted to protect tourism resources and eco-environment? In a word, tourism earth scientists should attach great importance to the research on these issues and use modern scientific and technical means to strengthen supervision and forecast of environmental changes in scenic areas on the basis of evaluation of environmental quality of scenic areas.

2.2.6 Preparation of Tourism Development Plans

Tourism plan is a crisscross matrix plan with multiple levels, multiple programs and disciplines. The comprehensive coordination and action of various disciplines are the basic guarantee for successful planning. As tourism earth-science is an emerging science which studies the rules of regional landscapes by virtue of theories and methods of earth-science, it plays an irreplaceable role in the practical process of tourism planning. Particularly, a series of issues in regional tourism planning have to be addressed under the guidance of theories and methods of earth-science. For example, the discovery and evaluation of tourism resources, the capacity measurement of scenic resources and environments, the exertion and

combination of functions of limited regional resources, the scientific interpretation of the causes of formation of tourism resources, the rational organization and design of touring routes and the scientific layout of various sections in tourism complexes, all have distinct earthscientific connotations and need to be studied and solved by earth-science workers. It can be seen that tourism planning is the specific application of earthscientific theories and methods in the domain of earth-science as well as an important practice of the research and development of tourism earth-science.

The contents and methods of tourism planning will be studied in detail in Chap. 8.

The Principles of Geotourism

Chen, A.; Lu, Y.; Ng, Y.C.Y.

2015, XXIII, 264 p. 7 illus. in color., Hardcover

ISBN: 978-3-662-46696-4