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On the Mountain Urban Landscape Studies

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Mountain Urban Landscape Studies is a discipline to research on the formation, evolution and characteristics of the urban landscape in mountainous areas. The author has made systematic research on the basic issues of the subject, including the definition of mountain urban landscape studies, its connotation and denotation, the research scope, research background and significance, research methodology, its relationship with landscape architecture, architecture, city planning and other disciplines.

Mountain Urban Landscape Studies, basic issues, system and framework

1 Background and significance

Since long, research on the urban landscape theory has been basically established on the universality and consistency of the cities in the plain areas, and that of the mountain urban landscape was merely an exception or supplement of that pattern. Actually urban landscape has various forms and features because of the different sites. As mountainous areas are important parts of the earth life system, they play critical roles in supporting life and development of human being as well as improving the quality of the living environment. "1/5 of the global land is mountainous area, and approximately 50% of the population live on the resources from the mountainous region"[1]. "China is a country with large area of mountains, which takes 2/3 of the land. More than half of the Chinese cities and towns are in mountainous areas"[2]. Looking at the land resource development in China, the intensity in plain areas is oversized, where the expansion of urban construction land is swallowing the scarce agriculture land. At the same time, the development intensity in mountainous regions is relatively low, which makes the unbalanced conditions between the plain areas and mountainous regions. As to the population growth, it is estimated that China's population will reach a summit of 1.6 to 1.7 billions by the mid of the 21st Century on the base of currently 1.2 billions. We will face pressure from the rapid population growth as well as land shortage. However, the real situation is that we have not utilized the land to its maximum limit as we only make more use of the plain areas. There is no doubt in such circumstance that the mountainous areas that take up 2/3 of the national territory will become the target for future urban development[2].

Cities and towns in mountainous area take a rather large proportion of the territory and the number of towns in China. Meanwhile, they have special strategic status. Cities in mountainous area are not only rich in landscape variety and biological diversity, they can also be built into charming and active cities where the built environment develops coordinately with the natural environment. The sensitivity and vulnerability of the ecological environment in the mountainous area bring the particularity and complexity of those cities and towns, which lead to more complicated issues and problems in the construction of the cities and towns in mountainous area than those in plain area. Due to the lack of knowledge about the ecological environment in mountainous area and theoretical guidance for landscape planning in the cities and towns in mountainous area and following blindly the theories and methods for landscape planning

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in the cities and towns in plain area, planners cannot adjust measures to local conditions to meet various requirements of the ecological environment, which turns "constructive destruction" into "destructive construction". Moreover, inheritance of the regional architecture and culture in the construction is neglected, so that the distinct features and charms of the cities and towns in mountainous area are disappearing gradually. With the rapid urbanization and urban sprawl in recent years, there are increasing environment problems. That is also the fact in the cities and towns in mountainous area. Therefore, it is urgent for the scientific and theoretical research on the landscape system of the cities in mountainous area so as to fundamentally improve understandings of the formation and evolution of the mountain cities, strengthen scientific urban landscape construction, and reduce randomness and destructiveness of the urban development in mountainous area[3,4].

This article discusses mountain urban landscape researches in the above-mentioned context, which tries to carry out theoretical research on mountain area urban landscape studies and establish the preliminary framework under the guidance of mountain urban studies and urban landscape theories in order to exert positive influence to the planning and construction of the mountain cities.

2 Concepts and understandings

2.1 Mountainous area

According to the definition in *Geography Dictionary*, mountainous area refers to "the general concept of many mountains, consisting of ridges and valleys. It features comparatively great absolute height and relative height, large cutting depth and cutting densities. It is usually located in region with active tectonic movement and external erosion effect, with complex geological structure, for example, the mountainous areas in West China"[5]. The landform that is included in the concept of the term "mountainous areas" in the text refers on one hand to the concept of mountainous area that is generally accepted in geomorphology, which is the same to that in *Ci Hai* (or *Unabridged, Comprehensive Dictionary*) and *Geography Dictionary*, "in such an environment, the landform might be slopes or flat ground; on the other hand, it also includes hills and rugged plateaus.[2] This article calls the two forms "mountain terrain". The generalized concept of mountain city is established as the research objects are the characteristics and laws of the "mountain terrain" that has obvious difference from the plain cities (without complex landforms). It also intends to clarify the great impacts of the topography and landforms on urban landscape and the changes to the urban layout, structure and ecological environment, as well as other differences including comparatively complicated engineering and technological measures.

There are narrow- and broad-sense concepts for mountain cities. The narrow-sense concept refers to cities and towns built on hillsides and some complex topography, where the gradient of the urban land is $\geqslant$5% and depth (relative height difference in an area of 2 km×2 km) is $\geqslant$25 m. Thus the land for living, production, transportation, green spaces and other uses are organized on undulating land, which creates special urban space patterns and environment that are different from the plain cities. Such mountainous area cities include some well-known mountain cities like Chongqing, Qingdao, Hong Kong, Yibin, Zunyi, Panzhihua, and etc. Mountainous cities in a broad sense lay emphasis on the relationship of the mountains and the urban structure. Although the built areas of such a city are on comparatively flat lands, the city has unique urban structure because of the mountains, water and other landforms that exert great influence to the form and features of the city. The mountains become part of the urban land or the background of the city. Such cities include Zhuhai, Lhasa, Xiamen, Nanjing, Guilin, Lijiang, Sanya, and etc.

Landscape is a term that is attractive but not easy to clarify either in the West or China. The term came from German "landschaft", and "paysage" in French. The English term "1andscape" has meanings of scenes and good views. It may stands for a landscape painting, the terrain of a certain area, or the view from some angles. It is a term with multiple meanings, and persons from different background will hold different understandings of landscape. Generally speaking, there are three types of understanding of landscape: the first one is of aesthetics as a concept of visual art, which is a synonym to Fengshui. As an aesthetic object, landscape is the target of landscape poems, paintings and landscape discipline[6].

The second understanding is of geography. "Landscape" in geography refers to the regular composition of the organic and inorganic spheres on the land surface, including natural and cultural landscapes. The natural

landscape refers to the common actions of the natural elements including the terrain, landform, climate, soil, vegetation and etc. to create integrated and harmonious systems, which repeat on large scale in certain areas on the earth. Cultural landscape is the result of physical and spiritual activities of human society, including cities, villages, architecture, culture, science, politics, economy, religion, custom, and notions. Natural landscape is the base for cultural landscape and the platform for cultural activities, which defines the property and features of the cultural landscape to a certain degree, and gives regional characteristics to the cultural landscape. Meanwhile, the cultural landscape will greatly change the original natural landscape. Landscape research in geography focuses on the evolution and relationship of the landscape elements and the organizational structure of the elements in the landscape in order to comprehensively understand the laws of landscape changes. It takes landscape as a complex of the climate, soil, landform, and living creatures on the earth surface. With such understanding, the concept of landscape is very close to the terms of eco-system or biogeocenose. The role of human being should not be excluded in such a comprehensive concept[7,8].

The third understanding is the concept from landscape ecology. In this circumstance, landscape is an area with space heterogeneity, consisting of interactional patches or ecosystem, and appears repeatedly in similar forms. We can see from the definition that landscape is a natural system that is higher than and the carrier of ecosystem. Ecosystems are relatively homogeneous while landscapes are heterogeneous. Heterogeneity is an important concept for this understanding[9].

Despite the obvious differences among the above-mentioned three understandings, they have historical connection. For example, the landscape concept in landscape ecology is developed step by step from the visual art to the synthesized understanding in geography, and to the regional heterogeneity in landscape ecology.

In short, landscape can be regarded as the harmony and coexistence of artificial and natural environments. It is the process of their interactions. Landscape has the properties of art, science, place, and symbolism.

3 Understandings of the basic issues

3.1 Definition of Mountain Urban Landscape Studies

Mountain urban landscape studies is a new discipline that takes the landscape of the mountain cities as its research objects. It is a comprehensive interdisciplinary subject that integrates landscape studies and mountain urbanology. Mountain urban landscape studies is a subject that looks into the interaction and relationship of the mountain, land, people, architecture, vegetation and etc. in mountain cities, and it is to probe into the harmonious relationship between the natural and cultural environments, and that between the aesthetic and ecological significance. It takes the values of ecological civilization as its background, the perfect integration of purposiveness and laws of human settlements as its objectives. It is a subject that aims at the composite ecosystem of nature, human being and society in mountain cities and probes into the essence, meanings, laws, values and landscape creation by starting from the principles of landscape studies, mountain science and urban design and synthesizing relevant disciplines.

3.2 Content of Mountain Urban Landscape Studies

The fundamental task of mountain urban landscape studies is to reveal the laws in the historical process of mountain urban landscape evolution. It is to understand, through investigation and synthetic and analytical researches on mountain urban landscape, the internal mechanism and external conditions of mountain urban landscape evolution as well as the basic features and laws in mountain urban landscape development and construction in order to reach a balanced demand of scientific construction and rational development, so as to enrich research content to promote and develop mountain urban landscape studies. If the various mountain urban landscapes in history are individuals guided by some common characters, then mountain urban landscape studies mainly researches on the common characters and pays attention to the investigation of the individual cases and the time and space sequences on the basis of the common characters[10].

3.3 Connotation and denotation of Mountain Urban Landscape Studies

With the economic growth and science and technology development in contemporary society, people will look at mountain urban landscape creation from a broader view, so that the research field of mountain urban landscape studies is widening. Mountain urban landscape creation is no longer limited to visual expression by form making mountain urban buildings and space layout. It has gone

beyond the traditional means of landscape creation by building's scale, layout and image to present people's pursuit to landscape in mountain cities. The ecological relationship of mountain cities with the nature, the interaction of mountain cities with human's activities, the significance of mountain cities to human's physical and spiritual lives are considered as the critical factors in mountain urban landscape creation. Thus the activities have surpassed visual art. Therefore, the connotation and denotation of mountain urban landscape studies have been extended and enriched to create the new concepts of mountain urban landscape studies based on the harmonious relationship among human being, natural mountains and urban spaces, with cultural atmosphere, social life, and meaningful sense of place as its spiritual connotation, urban physical artificial environment and space composition as its form of expression, and ecosystem balance of mountain cities as its goal.

Mountain urban landscape studies has wide connections with landscape studies, urbanology, environment science, geography, ecology, sociology, behavioral psychology and other disciplines. It consists of the physical forms and spiritual field of mountain cities. It is a general exploration to the laws of urban landscape construction activities. As a relatively independent discipline, mountain urban landscape studies has similar factors to landscape studies and mountain urbanology. It can be seen as a branch of mountain urbanology or landscape studies, but also the meeting point of the two disciplines, or that of urban construction practice and landscape creation theory. Therefore, researches in mountain urban landscape studies can take the general laws of mountain urbanology and landscape studies as its theoretical foundation to give comprehensive explanations to the connotation, concepts, phenomenon and creation of mountain urban landscape. If the researches have no connection to mountain urbanology and landscape studies, mountain urban landscape studies will remain on recording of experience and phenomena, which lacks profound theoretical exploration. And mountain urban landscape studies will be caught up in abstraction without support from practical content if it has no link with mountain city construction practice, which will be weak in guiding urban construction. For this reason, we can say that mountain urban landscape studies involves theoretical research as well as applied research. It is an interdisciplinary subject. Generally speaking, it includes the following relevant disciplines and professions.

1) Basic disciplines in mountain urban landscape studies: urban geography, landscape ecology, urban philosophy, urban aesthetics, behavioral psychology, landscape poem and literature, etc.

2) Technological basic disciplines in mountain urban landscape studies: landscape architecture, architecture, urban planning, mountain urban calamity studies, landscape ecology, etc.

3) Professional disciplines in mountain urban landscape studies: mountain landscape design, mountain urban design, mountain architectural design, mountain gardening and landscaping, planting design, mountain environmental design (including night view, advertisement, urban furniture, outdoor sculpture, mural, …), mountain urban road engineering, mountain urban calamity prevention, mountain urban facilities, etc.

3.4 Research objects and fields of Mountain Urban Landscape Studies

Researches on mountain urban landscape can be carried out from two ways: first of all, to study the wide and rich denotation of mountain urban landscape studies from the broad social, economic, politic and cultural aspects of mountain cities; secondly, to appreciate, analyze buildings, mountain urban space morphology, mountain natural landscape and the objective standards and laws of mountain urban landscape studies from the angle of formal aesthetics, and to guide the researches with a systematic view, and to define the research fields from broad to narrow sense and from the concrete to the abstract. More specifically, mountain cities are developed from small to big in a continuous process, from a site or a piece of urban sculpture to a cluster of buildings or an urban area, and to complicated human settlements in mountain cities and regional environment. There are several layers in the physical composition of mountain cities. It is the same for the composition of spiritual factors that have multi-layered and angles of complicated connotation and denotation as the aesthetic awareness of landscape from individuals to the public groups. Moreover, the two aspects are interwoven together on different layers of mountain urban life to create more intricate situations for mountain urban landscape studies. Therefore, the definition of the research objects for mountain urban landscape studies must meet the demand of the above-mentioned situation to form a framework of research objects from macro, middle, and micro layers.

1) Macro layer of mountain urban landscape studies:

mountain control, water control, planting control, population and land use control, planning structure control, skyline control, bundline control, urban subregion edge control, key viewing point control, district feature control, etc.

2) Middle layer of mountain urban landscape studies: building group landscape, urban open space landscape, urban transportation infrastructure landscape, subordinate landscape, etc.

3) Micro layer of mountain urban landscape studies: characteristic landscape elements (including elements derived from the topography like retaining walls and steps; elements from transportation infrastructure like cable car and ropeway; elements from special planting forms like cliff-side plants and vertical planting; elements from architecture like stilted houses, one-sided streets), and landscape marking system.

3.5 System of Mountain Urban Landscape Studies

Mountain urban landscape studies is an applied discipline established on broad natural science, art and humanities. It has links with legislation, economy, informational geography, ecology, landform studies, engineering, and etc. Kevin Lynch pointed out that you must study 270 courses if you want to be a really qualified urban landscape designer. It is clear that this discipline involves a lot of knowledge from natural science and humanities, landscape studies and architecture, urban planning, gardening and landscaping, art design, and etc. Although all the disciplines have specific techniques, there is something in common between the methodology and relevant knowledge that mountain landscape planning relies on and mountain urban planning. The difference is that mountain urban landscape design pays more attention to selection of vegetation and other natural materials to organize space structures with various sizes under the premise of special terrain and landform. Landscape designers need comprehensive knowledge and ability to design works with a sense of ecological civilization and art with the support of various disciplines.

Figure 1 shows the disciplines that constitute the system of mountain urban landscape studies.

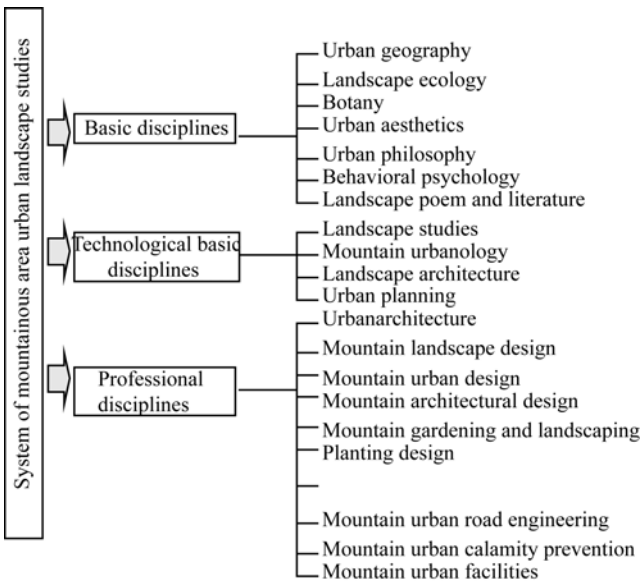

Figure 1 System of mountainous area urban landscape studies.

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