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Conceptual Construction of Copper Culture Ecological Museum in Dongchuan, Yunnan, China*

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***Abstract*—An ecological museum, also abbreviated to ecomuseum, was derived from France in the early 1970s, and is a dynamic way in which communities preserve, interpret, and manage their heritage for a sustainable development. Based on rich field investigations, interviews and textual research, this paper explores the significance and possibility of constructing the Copper Culture Ecological Museum in Dongchuan in qualitative and quantitative research methods. The first part of this paper discusses the concept and origin of the ecomuseum; the second part traces the history of Dongchuan copper culture and its development trace-ability, and analyzes the quantity and status of the Dongchuan copper deposits in quantitative methods; the third part analyzes advantages and conditions of ecological museum construction through qualitative analysis; the fourth part summarizes that the ecological museum should not only play an important role in the protection and utilization of Dongchuan copper cultural heritage, but also play an important role in the ecological civilization construction of Dongchuan area.**

Keywords—ecomuseum; conceptual design; Dongchuan area; copper culture

I. INTRODUCTION

The concepts of "ecomuseum" foster holistic interpretations of cultural heritage, there are presently about 300 operating ecomuseums in the world, mainly in Europe. The construction of ecomuseum in China is mainly based on ethnic villages. In recent years, the concept and method of ecomuseum have been widely used in the protection and utilization of traditional villages, historical blocks, industrial heritage, and thematic heritage, resulting in various types of ecological museums. Dongchuan City, which is affiliated to Kunming City, Yunnan Province, is famous for its copper mines and the starting point of ancient copper roads. There are many copper mine sites dated from ancient time including furnaces, mines, miners' residences, refining piles, etc.

II. THEORY: ECOMUSEUM

The word "Ecomuseum" was came up by Georges Henri Rivière and Hugues de Varine during the 9th International Museum Congress in 1971 and links between the idea of heritage and the environment. A year later, He took the opportunity at the ICOM conference named "Museum and Environment", to use the term once more. Than the concept was quickly discussed and expressed by the inventors through several theoretical and empirical practices during 1970s. Three definitions of the ecomuseum concept introduced by Rivière in 1973, 1978 and 1980 demonstrated the 'evolutive' process which still regenerates until now. The last version [1] being extremely lengthy, the key words may be pointed as follows: the mirror tool; places of laboratories, protection centers and schools; with characteristics of space and time, local identity, continuity and historical memory.

After comparing with the traditional museum (=building + collections + experts + public), René Rivard [2] offer a feasible formula to the ecomuseum (=territory + heritage + memory + population). He also distinguished four categories (discovery, development, specialist and 'combat') ecomuseum and stressed the interactions between humans and the natural environment in an ecomuseum. Those simple illustrations may easily help people who are not familiar with the notion; however it is too simple to grasp the whole idea of "Ecomuseum". Thus, Another pioneer Varine[3] reiterate the previous main idea in four key objectives: i) as an object and data bank for the community; ii) as an observatory of change and help the community react to changes; iii) as a laboratory and focal point for meetings, discussion and new initiatives; iv) as a showcase to reveal the community and its region to visitors.

The official definition of the ecomuseum originated in France statute known as the Ecomuseum Charter[4] in 1981. In 2004, the meeting "Long Networks, Ecomuseums and Europe" (Trento, Italy) came to an agreement "Declaration of Intent" and offered the definition as following: "An Ecomuseum is a dynamic way in which communities preserve, interpret, and manage their heritage for a sustainable development. An Ecomuseum is based on a community agreement." After that, a rich number of scholars, institutions and associations defined the notion of "Ecomuseum" according to their own interest and practices, until "Milan Cooperation Charter"[5] in 2017, which reach an agreement that "Ecomuseums" still a constantly evolving concepts so that a unique standard definition not possible. "Milan Cooperation Charter" was adopted according to ideas,

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issues and debates raised by participants during the First Forum of Ecomuseums and Community Museums took place in 2016 inside the 24th ICOM General Conference and outlined a common vision of ecomuseums which emphasizes on unchangeable elements: participatory process, specific projects related to cultural heritage and improvement of local communities. Meanwhile, a platform called DROPS was established to exchange and experience sharing between ecomuseums and community museums.

III. ECOMUSEUM IN CHINA

With the new phase of industrialization and rapid economic growth, the global ecomuseum movement was not given too much attention in the 1980s. However, the balance between economic development and ecological environment was soon broken and the environmental protection became an increasing concern for both the Chinese government and society as a whole. A cultural cooperation project of Sino-Norwegian signed in 1997, in order to build up China's first ecomuseum in the remote mountain district of the ethnic group autonomous administrative region of Liuzhi in Guizhou, where characterized by the ancient culture of the Miao people. After years practice in China, the 2005 Guizhou International Eco-museum Forum was held from June 1 to 4 of the year in Guiyang, capital of Guizhou Province. About 100 researchers from 15 countries attended the forum under the theme of "Communication and Exploration".

One of the pioneering figure named Su Donghai summarized the intense work for ecomuseum construction in the Liuzhi Principles[6] involved nine principles, which out outlined in an effort to enhance the 'in situ' preservation of local cultures in a respect for the villagers' ownership of their cultures. It is such an ideal concept for the local minority that the controversies rose in those First Generation of Chinese Ecomuseums among scarce participation of local people and over-developed tourism. The Second Generation in Guangxi adopted "Ecomuseum with Chinese Characteristics"[7] as three-party management structure, which is "guided by government, advised from experts, and participated by local people". However, the main type of Ecomuseum in China is Ethnic villages, which distributed in minority areas such as Guizhou, Yunnan, Guangxi, and Inner Mongolia. Developed in the new century, the Third Generation[8] refers to an ecological museum that protects and inherits various types of heritage resources and rural heritage in eastern developed regions of China, such as Fuzhou Sanfang Qixiang Community Ecological Museum, relying on historical and cultural blocks, exploring the protection-display-integrated system of tangible or intangible heritage, cultural and creative concepts in the city.

After more than 20 years development, there are about 80 ecological museums that are under construction and proposed throughout in China[9]. Some ecological museums are also built on abandoned industrial site, for the protection and utilization of industrial heritage in China especially in resource-exhausted cities. By protecting and reusing existing machinery, equipment, factory buildings, etc., industrial heritage sites are transformed into a tourism base that combines industrial civilization and recreational functions. It is necessary to combine theories and relevant principles of Ecomuseum, adopt appropriate policies according to local conditions, and deal with the contradiction between humanistic environment and economic growth, in order to actively explore the new development direction of resource-exhausted cities.

IV. RESEARCH METHODS AND AREA

According to the Draft of Construction Guide to Eco-museum, the construction process of the ecological museum can be divided into several parts[10]: presupposition study, fund raising and planning and construction procedures. "The presupposition study is a judgment on the feasibility of building an ecological museum and a basic idea for the construction goal. In the process of selecting the object of establishing an ecological museum, experts or relevant departments can find the location suitable for the construction of the ecological museum according to the definition and standards of the ecological museum." Based on rich field investigations, interviews and textual research, this article explores the significance and possible conception of constructing the Copper Culture Ecological Museum in Dongchuan by qualitative and quantitative research methods.

This research focuses on one of the resource-exhausted city in Yunnan Province, China. It was once a prefecture-level city in 1958 and canceled in 1998, now is one of the districts under the jurisdiction of Kunming City. It has a population of 271,917 people (Resources: Statistic Bureau Yunnan, 2014) and a land area of 1858.79 square kilometers. Dongchuan has a history of copper mining and smelting for more than 2,000 years and has been one of China's important copper production bases known as "South Capital of Copper" (in Chinese "天南铜都"). In 2018, an archaeological sites more than 300 square meters of settlement related to copper smelting was excavated to shows that at least before the Warring States (BC475 - BC221), this place was already mining and utilizing mineral resources. The historical logging activity of the Dongchuan Copper Mine has been supported by the "Tanglang Copper Washbasin" (in Chinese "堂狼铜洗", Tanglang is the ancient place names for Dongchuan) since the first year of the Eastern Han Dynasty (76 AD). By the time during 1726 to 1858 in Qing Dynasty, copper mining industry reached its peak, with an annual output of copper mine up to an average of 6,000 tons, which became the most important copper base for coinage at that time[11]. During the period of the Republic of China, Dongchuan Copper Mine has become an important strategic military resource during the war time providing raw material security for the country's weapons and equipment manufacturing. After the founding of the People's Republic of China, the development of Dongchuan Copper Mine was included in the first National Five-year Plan (1953-1958) and Dongchuan Mining Bureau was established in 1953 assisted by the Soviet Union. However, after a more than 40 years period of mining, by the end of the 20th century, Dongchuan Copper Mine had once again appeared depleted, the mountains and rivers was devastated, the enterprise went bankrupt, the city was dilapidated. A new company named Yunnan Copper(Group) Co., LTD. was established among

the area, however, Dongchuan was no longer as glory as before.

V. THE COMPONENTS OF DONGCHUAN COPPER CULTURE RESOURCE

Understanding of local culture plays an essential role of Ecomuseum construction, thus, the better experts or relevant departments know Dongchuan copper culture resources, the more suitable location can be chosen for the Ecomuseum.

Dongchuan was former the famous industrial area and latter an Industrial Culture Landscape Ecological Museum can be conceivable. In the light of fundamental study, industrial cultural landscapes[12] are the remains of raw material mining, product manufacturing, product transportation and central selling places, including mines, factories, stations, ports, etc. The cultural resources related to copper mining and melting are divided into three groups on the basis of tangible culture, intangible culture and cultural landscape.

Firstly, Archaeological artifacts, ancient copper mine sites, remains of transportation roads and etc. belong to the tangible culture. There are a lot of ancient mining and smelting copper ruins left in Dongchuan, and these remains reflect the copper culture of Dongchuan in different historical periods. Taking Laomingcao (in Chinese "老明槽") Copper Mining Sites as an example[13], it is located on the northwest side of the modern open-pit mining sites in Tangdan Town and covers an area of about 5,000 square meters. In the upper part are the sluice gates and diversion ditches for mining and lower part few pits left which can be traced back to the Spring and Autumn Period and the Warring States Period (770BC - 221BC). While, the copper mining sites deprived from the Ming and Qing Dynasties are densely distributed in Yinmin, Shekuai, Tangdan Towns. Also the remains of shelters and residential places for workers are left, and copper transportation roads connect the above points. It is a veritable an ancient copper mine museum preserved for nowadays.

Secondly the ancient technology of mining and melting copper, the anecdotes of celebrity related to copper mines and the working spirits are the intangible culture part. There are several copper mining and smelting methods stem from the Bronze Age such as[14] "Fire Burning and Water Splashing", and the time later "V-shaped Iron Soldering Drilling Hole with Water Jetting", "Fixed Schedule for Copper Melting Based on 2/3/4/6 People" and so on. When it comes to the memories of copper mine worker, there are plenty of stories and legend passed from mouth to mouth and the hardworking spirits in such a tough environment could always be a touching story for their descendants. Those are special characters making Dongchuan a unique place.

Thirdly, cultural landscape refers to Changes in surface vegetation and land-forms, especially natural disaster caused by the human beings such as mudslides etc. Due to long time exploitation, the landscape there shaped by human a lot. An explicit road cut through the mountain in the middle with barren land is a common scene there. In some places, a large amount of red alkalized soil appears on the surface due to over-exploitation; in other places, debris flows frequently which forms alluvial fan. These natural scenes are the result of human activities and also the industrial cultural landscape created by the mining of Dongchuan Copper Mine.

VI. CONCEPTUAL CONSTRUCTION PLAN

In the light of "Pilot model"[15] for designing Korea Rural Heritage Ecomuseum, the physical components of the Dongchuan Cooper Culture Ecomuseum are conceive as follows: core ecomuseum, satellite ecomuseums, and copper transportation trails.

The core ecomuseum focus on the tasks which dealing with the participation of local people and research data collection. Around the Yinmin, Shekuai and Tangdan Town, the remains of ancient furnace, pits, architecture ruins and other regional heritages are still investigation-needed. Experts and Archaeologists concentrate on this area to reach more first-hand materials and do experiment on preservation techniques providing more sophisticated know-how to protect those heritages. Additionally, training for residents and meetings about the operation of a rural ecomuseum are also provided. Archaeological Museum and Copper Mine Bureau Site are also in this area. A new Copper Culture Museum, which combines historical culture and the characteristics of Dongchuan city, is under planning; Copper handicraft processing base (including processing workshops, exhibition halls, storage rooms, etc.) is under construction. Those facilities related to non-physical parts of ecomuseum and the resident organizations should not be overlooked and need to participate with.

Satellite museums take on the heritage related to regional heritage and landscapes. There are several satellite ecomuseums conserved in Dongchuan Area among which are Debris Flow National Geo Park and Red Land Scenic Area. There are 3 world-class, 16 at the national level, 19 at the provincial level and 12 at the provincial level of the geological relics in the park with the scientific value, popular science value, aesthetic value, typicality, integrity, and historical and cultural value [16]. Since 2004, Dongchuan has successfully held several Auto Cross Country Tournaments in this debris flow area and has now become an international event. The Dongchuan Red Land Scenic Area has been in business since 2012. It has won the favor of tourists from home and abroad with its rich landscapes. These places are representative of the post-industrial copper culture and the best area for human beings to fear nature and reflect on self-behavior.

Core ecomuseum and satellite ecomuseums are connected by discovery trails, which are based on the old copper transportation roads. Good connection system is crucial for Dongchuan Copper Culture Ecomuseum, because it is made up of scattered industrial heritages that are dispersed in rural open areas. Not only the trails from core ecomuseum to satellite ecomuseums, but also the trails between satellite ecomuseums are taken into account. In consideration of regional conditions and distances, the transportation systems such as private car, self-driving camping base, public bus, bicycle or hiking routes, etc. can be expected.

VII. CONCLUSION

It is desirable to expand the range of targets for conservation from copper culture in Dongchuan areas. Ecomuseum can be a highly valuable tool that can help preserve copper culture sites and neighboring areas. Ecomuseum can also enhance community identities, and strengthen local economies. After the concept construction, the next step is communicating with the local residents, the residents can determine the construction under the independent will and spontaneous enthusiasm of the residents. Ecological Museum or residents of a certain area spontaneously generate the will to protect their own culture and build an ecological museum, apply to relevant departments, and determine the construction of an ecological museum through relevant inspections in line with the requirements of building an ecological museum. The ecological museum should first be an ecological enlightenment in a modern civilization that transcends environmental protection, and then it is a community re-engineering that transcends the tourism economy and local development. Ultimately, it should become a cultural sublimation of ecological civilization construction.

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