

Case Analysis and Experience Enlightenment of Foreign and Domestic Mining Wasteland Landscape Reconstruction Design

Fuyan Yu

School of Art and Design
Huanghe Science and Technology College
Zhengzhou, China

Abstract—Nowadays, the expanding process of urban construction may produce all kinds of industrial wastelands. The reasonable planning and reuse of wastelands can pass down the history and culture of each city and create urban landscape with local characteristics. By analyzing foreign and domestic wasteland landscape reconstruction cases, the author has some experience enlightenment. It is suggested to respect the natural evolution of the wasteland in reconstruction, introduce urban life into wastelands to stimulate its vitality and reserve and interpret the industrial history of wastelands. This idea may provide experience reference for the similar practice and offer theoretical basis for creating China's urban landscape in a sustainable way and the continuation of historical and cultural characteristics of the city.

Keywords—wasteland; landscape reconstruction; experience; enlightenment

I. INTRODUCTION

The global economic transformation has left a large number of wastelands, including abandoned factories, garbage dumps, military bases, waterfront, etc. These sites are often subjected to different degrees of damage and pollution. But it is a double-edged sword to the development of city. If these sites can be improved and re-integrated into the urban environment, it can not only repair urban eco-network and space patterns, but also can improve urban land use efficacy and increase vitality of the city. However, if these sites are not improved effectively, they will become the obstacle to urban development. The landscape reconstruction of the wasteland is a complicated work, which involves many aspects, such as ecology, society, culture and so on. Therefore, this article will analyze the foreign and domestic representative cases from multiple perspectives in recent years, in order to provide experience reference for similar practices.

II. CASE ANALYSIS OF THE DOMESTIC AND FOREIGN MINING WASTELAND

A. Japan's Yubari Coal Mine - Mainly Managing Coal Resources and Creating Relaxation Culture

1) *General situation*: Yubari, located in Hokkaido, has been developed on large-scaled coal mine enterprises and with "North Coal" as center, so it is known as "City of Coal". It is a typical resource-based city. In order to reduce the impact of the recession of coal industry, Yubari strove to develop tourism through the way of government borrowing and increased the intensity of attracting small and medium enterprises, but it did not change the momentum of the recession. By the year of 2000, the government had financial difficulties only with a financial index of 20%. By July 2006, the government of Yubari declared bankruptcy, and it became a temporary municipality directly under the central government, as a transitional measure to solve the government debt. This incident has certain significance to the economic transformation of China's resource-based cities.

2) *The re-utilization of landscape resources*: Yubari does not have natural tourism resources. But based on the historical background of "City of Coal", they planned tourist attractions centered on "coal", and have built a Coal History Village (Museum) integrating education and entertainment function together. In addition, Yubari also constructed Robot Science Museum, Museum of Zoology, Adventurer's Playground, ski field and other facilities, so tourists regardless of gender and age, with different hobbies, can spend a good time here. In 2003, Yubari Film Library has born and become a new tourist attraction. In the past 10 years, Yubari's visitors can reach up to a range of 1600000 ~ 2300000 person-time annually. Among them there is a range of 500000 ~ 400000 person-time to Coal Museum. One of the most commendable are "Coal Mine Life Museum" that can reflect the life scenes of the mine, "Coal Mine Machinery Museum" that visitors can experience coal-cutting machinery, "Coal Mine History Museum" and "Coal Mine Action Museum" vividly reappearing the production and life scenes of coal mine of that generation. Hearing the roar of a large excavator, seeing the labor scene of

Fund program: 2014 Annual Science Research Program of Zhengzhou Municipal Science and Technology Bureau: Research on Landscape Rebuilding Design and Re-utilization Strategy of Mining Wasteland in Zhengzhou. Serial No.: 20141110.

simulation waxen figures, visitors may have a feeling that they are personally on the scene.

3) *Enlightenment*: Yubari Coal History Village landscape has expressed its scene and space with the technique of memory, motivating visitors a strong sense of identity, belonging and participation. It is the representation of regional culture, the witness and deposit of the evolution of environmental history. At the same time, Yubari has successfully realized the economic transformation of mining city through careful planning activities and taking different advantages of tourist attractions. Yubari Coal History Village is a typical case that uses its own unique mineral resources history to create characteristic landscape.

B. German North Geerpa Opencast Coal Mine - an Industrial Kingdom with a Transformation of a Very Old City into a New One

1) *General situation*: North Geerpa, located in the former East Germany, is famous open-air coal mining area. After the mine was forced to stop production, the area is listed as the key project of reconstruction in East Germany. The reconstruction needs the support of good idea. Bauhaus has participated in this major project. Bauhaus was as a very fashionable design system throughout the world at that time. Although the rise of modernism is a shock to Bauhaus design idea, and a progress, it can not change the fact that the ideological and aesthetic taste of Bauhaus has influenced a whole generation in many modern industrial designs. Bauhaus advocates to treat the real world objectively, emphasizes to focus on cognitive activities in creation, and fiercely criticize classicism. Bauhaus knew her times and followed the principle of manifesting this times. It believes that modern industry, like modern life, covering everything, should get absorbed in a variety of skills, and become a comprehensive art. It emphasizes that architects, artists and painters shall design for art. This was the first time for Bauhaus to participate in large-scale landscape and ecological reconstruction. They considered remaining landform and large machinery as landscape features in order to manifest the important role of the large-scale machinery in the human life and record the industrial history of the area. It put forward the concept of "industrial garden kingdom".

2) *Resource reuse*: Use existing mining areas to create relaxation sites and help people understand the coal mine industry and experience the relationship between nature and technology. Different artists, landscape designers and architects get together here, and held a "summer declaration" activity to explore landscape characteristics and viewing value of the wasteland. It is aimed to leave some traces of viewing value and memory value before large-sized watering. It was co-designed by stage designers of the United Kingdom and landscape designers and architects of Germany. It used the enclosed place dug by excavator, forming a huge open-air theater to play popular rock music and thus attract a large number of young people here. It has enriched the cultural activities of this region. The theater can accommodate more than 25000 people, meanwhile, it can be used to perform opera and hold sports. Exciting and magical lights shine on giant machinery, perfectly matching with

heavy metal music. It connected the train, rail and other transport facilities in series to form an open museum, telling people the 150 years of the development process of the open coal mine. "Iron City" has the biggest metal sculpture group in Europe, and it has greatly increased the awareness of the region. In summer, it is the holy land of rock music lovers. After large areas of mining pits were filled with water, it has created a 5800000 m² lake. And it has greatly improved the ecological environment of this area. The surrounding vegetation is replaced gradually, attracting a lot of birds.

3) *Enlightenment*: The case has developed a new idea for the future reconstruction of industrial wastelands. This idea emphasizes to respect the existing landscape and do more with less money. The large-scale excavation may damage fragile ecological environment of wasteland. Through the rational analysis, it takes advantages of existing landscape characteristics and creates a landscape with distinct local characteristics. At same time, it can improve the ecological environment of the surrounding areas, drive the development of the industries in the surrounding areas and thus form an industrial chain and truly realize the sustainable development and get social benefits, ecological benefits, and economic benefits at same time.

C. South Lake Park of Tangshan - Taking Advantages of Plant Resources and Bringing Good out of Bad

1) *General situation*: Tangshan is a coal-based heavy industrial city with more than a hundred years of mining history. But it has caused serious damage to the ecological environment of Tangshan. Near South Lake Park, there are a lot of subsidence areas. They were caused by the mining activities in Kailuan Coal Mine. In this territory are a lot of waters because of ground settlement, farmland, landfill and orchards. In 1996, the Municipal Party Committee and Government of Tangshan have listed the management of subsidence area in the management plan. They gave a clear garbage-eliminating instruction to carry out the activity of "one person a tree, creating an urban forest", treated sewage of subsidence area, removed and diverted water, and has built the South Lake Park.

2) *Resource reuse*: The park is located in the coal mining subsidence area, and there may be topographic change in the future. So mainly use plant landscape and expand green area to play the function of its ecological environment. In plant selection, keep original plants as far as possible to transform the urban environment with the environmental effects of plants. Create different terrain according to the existing terrain conditions, and form a water landscape by taking advantage of existing terrain. Then clear away rubbish in the park and fill 1m thick of earth into dry pits. Pile earth on plots with large elevation difference and make them into slopes, creating various terrains. The garbage hill covers an area of 28000 square meters with flat terrain. To increase its ups and downs, pile earth on it and create it into a three-dimensional landscape. In the park are 23 different sized waters, but some waters are messy. Dig through waters in the park, forming a water landscape covering nearly 10 million square meters. Other messy small waters mainly are treated in a relatively concentrated way. Reduce the separation of

embankment and create a water system with different sized waters and clear priorities.

3) *Enlightenment*: The construction of Tangshan South Lake Eco-city has promoted the transformation of resource-based city in the industrial planning. Taking the opportunities of ecological restoration, excavation of historical and cultural heritage, landscape greening and lake widening, it has been built into a new city integrating ecological protection, leisure and entertainment, landscape and holiday, cultural exhibition, residential building, commercial shopping, and high-tech industry. It has become a model of the transformation of resource-based city and an ecological reconstruction banner. The city focuses on the construction of holiday resorts, cultural and creative parks, and national urban wetland park, to promote the use of landscape real estate. "Transform disadvantages into advantages, and bring good out of bad". It is a valuable experience of Tangshan South Lack Eco-city in the implementation of comprehensive improvement. It has maintained the integrity of the wetland system, and it is listed as "National Urban Wetland Park" by the Ministry of Construction. It is "Lung of New Tangshan City".

III. EXPERIENCE AND THINKING

Through analyzing the domestic and foreign coal mine wasteland landscape resources reuse cases, we can draw a conclusion that we shall change our attitude to coal mine wasteland to successfully use the waste resources. After analysis and summary, it is worth learning from the following three aspects:

A. *Paying Attention to the Development Process of the Landscape*

The development and maturity of landscape is a long-term process, especially for the wastelands which suffer from pollution and destruction. It needs a long time for the improvement of the soil, the maturity of the vegetation community, the introduction of various leisure activities and social functions. In the process, in addition to the uncertainty of ecological system itself, the surrounding area also has uncertainty in the transformation, which makes the development of the site filled with many unpredictable factors. Therefore, in recent years, in the landscape transformation of some foreign wastelands, especially large-scale wastelands, they often do not consider the form of landscape as primary concern, but pay more attention to the forming process of landscape and the external conditions. This design approach does not require a clear space form in the initial plan, but make the land and various systems form their own forms in the development of time. This requires designers to provide a detailed landscape guidance strategy for the site. This strategy needs to integrate the site development, involving a variety of ecological and social processes, and shall be able to adapt to a series of changes of site and the surrounding areas in the future, so as to guide the long-term development of landscape.

B. *Focusing on the Activation of the Landscape on City*

In the past century, the understanding of the relationship between the landscape and the city has changed a lot in Western countries, from the idea of "refuge" to escape from city in 19th Century to the idea of "catalyst" to activate the city. People lay more emphasis on the integration of landscape into city with a positive attitude. It has become the source of vitality of city. China's urban development is different from the Western, but in recent years, there have been many wastelands due to the relocation of factories, shutdown of mines and etc. We are also facing the problem that how can these wastelands integrate into city? In this regard, foreign countries has renovated landscape of wastelands and introduced urban life into these sites successfully. Their experience on the recovery of urban vitality with landscape is worth our learning.

C. *Focusing on the Creation of the Characteristics of the Place*

To a certain extent, the landscape design is actually a kind of site creation. Only by profoundly expressing the implicit characteristics of the site and fully revealing the nature and cultural characteristics of the site, can these wastelands be created into memorable sites. The traditional garden style landscape has been rejected in today's wasteland reform, mainly because it only puts a beautiful dress on the wasteland and does not reveal its original nature and cultural characteristics, so it cannot reflect the continuation of the context of the site. The destructed natural system in the wasteland, huge and crude plants and structures, the desolation and mysterious atmosphere caused by long-term isolation from the outside world are all unique memory that the industrial era has left us. These characteristics have showed unique aesthetic qualities of the wastelands. In the landscape design, only by carefully interpreting the characteristics of these sites, can designers understand the true spirit of the site and create an attractive landscape.

IV. CONCLUSION

From the practice of the developed countries in the transformation of mining cities and regional economy, the method of solving the problem is not the same as the natural and social economic conditions are different in different countries and regions. The United Kingdom mainly relies on government intervention, while Japan mainly issues industrial policies to carry out the industrial structural adjustment and urban restructuring. The developed countries mainly use financial aid, technical assistance, and policy preference to help the mining cities with declining industries. Basic countermeasures include industrial diversification and strengthening infrastructure construction, considering the municipal and cultural construction as the important content of the transformation, local financial support and attracting business participation and etc. No matter what way they use for the transformation, it can not be separated from the in-depth excavation and artful utilization of the landscape resources of the wastelands. It has an enlightening significance on us to study the practices and experiences of developed countries. Our mining cities have distinct

characteristics in the formation and development of resource-based industry, real conditions and etc. So, it is not feasible to indiscriminately imitate the practice of foreign countries. We should start it from our own national conditions and be guided by scientific development concept and targeted by the construction of a harmonious socialist society. We shall not only learn advanced experience of other countries but also make innovation and sum up experience to walk our way in the transformation of mining cities.

REFERENCES

- [1] Meng Dan. Research on Building and Environment Regeneration in Mining Wasteland. Dalian University of Technology, 2011.
- [2] Su Fei, Zhang Pingyu. Urban Wasteland Management of European and American Countries and Enlightenment. *International Urban Planning*, 2007, (4): 7.
- [3] Xia Xia. Changing from Wasteland into Modern Urban Landscape. Master's Thesis of Nanjing Forestry University, 2007.