

## LETTER TO THE EDITOR

# Humanized Art Design of Ecological Landscape of Mountain Trail

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The construction of recreational walkway can not only protect natural and cultural heritage, but also meet the public's outdoor recreational needs. The three principles for the construction of recreational walkway are: to make the walkway users enjoy the pleasure of hiking as much as possible; to maintain the ecological, cultural and landscape characteristics of the area through which the walkway passes; and to provide sufficient information on facilities and services for the walkway users with different itinerary arrangements. This paper analyses the basic design of the mountain trail, and discusses the principle and method of its overall layout and landscape design.

Mountain Trail; Ecological Landscape; Environment; Art Design

## I INTRODUCTION

Walkways are used as tourist roads in natural tourist areas, and also give people a sense of closeness to nature and becomes more and more popular in urban landscape because the construction of it is often adapted to local conditions. The design of walkways is based on the characteristics of vegetation in the passing area and combined with the characteristics of topography and landform to rationally arrange the erection point, height, width, material and width of the trestle, so on, so as to minimize the construction and the disturbance of human activities such as tourism to the ecosystem of the area (Collins et al. 2018, Herrerafranco et al. 2018). In this paper, the detailed design and study of the humanized ecological landscape are carried out with the help of the characteristics of the mountain trail.

Liang (2019) published an article entitled "Modeling of Modern Eco-Environment Landscape Planning in Sponge City" in Ekoloji (Issue 107, 2009). Based on the premise that rational planning of modern urban ecological environment landscape is necessary for the construction of sponge city, a sustainable planning model of sponge urban ecological environment landscape was constructed, including seven modules, framework management, BMP layout, land simulation, BMIP simulation, transmission simulation, optimization and post-processing. BMP was used to simulate the runoff calculation, pollutant loss and degradation process of sponge city in order to accurately arrange the landscape area. The relationship between negative pore water pressure, volumetric water content and permeability coefficient was calculated by using the processing program, and the differential equation of unsaturated seepage was established. The water content, permeability coefficient and unsaturated seepage flow were obtained according to the sponge city standard. After that, the modern ecological environment landscape was planned. The results showed that after 10 hours of engineering rainfall, the volumetric water content of vegetation soils in the model planning area reached the saturation level. With the increase of time, the pore space decreased gradually, and the permeability coefficient and permeability increased gradually. According to the

model, the recommended building area of BMP facilities in the core design area was calculated. In addition, the model provided an effective layout scheme for sponge city eco-environmental landscape, and the reduction efficiency was 85%. It showed that the eco-environmental landscape planning scheme is the best one. This paper provides a theoretical basis for other related eco-landscape designs. In addition, some scholars put forward other methods for ecological landscape design.

Chen et al. (2015) pointed out that under the background of national fitness and Chengdu's "Eastern Entry", the optimization and transformation of Longquanshan Mountain fitness walkways should not only consider its basic functions, but also consider its ecology, radiation area, landscape experience, social and economic benefits. Based on the comparison of the different design of mountain trails and flat-land trails in Chengdu, this paper focused on the analysis of the current situation of mountain trails. Through the investigation and analysis of the use of the trails, it put forward clear plans and suggestions for the construction and optimization of mountain trails in Chengdu, in order to meet the needs of environmental ecology, space humanization, landscape gardening, and diverse features, and to provide more pleasant outdoors sports environment. Xie (2018) carried out the data inquiry and field investigation of plant landscape of the fitness trail around the ancient city river in Suzhou, the combination of plant and other elements in plant landscape construction was investigated on the spot, and the application and combination methods of plants which accorded with the excellent model of Suzhou gardens and the local human characteristics of Suzhou were excavated, and their advantages and disadvantages were summarized. Based on the research of the above-mentioned literatures, this paper put forward the humanized art design of ecological landscape of mountain trail.

## II IDEA DESCRIPTION

The existing mountain trails are surrounded by beautiful natural scenery, dense forest vegetation, abundant tourism resources, historical and human landscape gathering, especially anti-Japanese War sites, of which the number ranks first in the city. On weekdays, there is an endless stream of tourists using the trails for mountain hiking, sightseeing and recreation. Some of the popular trails are crowded with people all day long. However, the overall quality of the current mountain trail construction is not high, and the rapid construction is accompanied by many problems, such as the lack of a unified construction standard, the lack of the loop system of the mountain trail, the serious damage to the surrounding ecological environment and local historical sites, the lack of distinctive trail landscape, unreasonable landscape design and so on. Nevertheless, the change of the people's extensive use and usage has put forward more and higher demands on all aspects of the trail, which makes the contradiction between the current situation of the trail and the needs of the people.

Studying the humanized art design of the ecological landscape of the mountain trail can provide some suggestions for its construction, improve its overall quality, make better use of the superior natural, historical and cultural resources and good current conditions of the mountain, and provide good urban public space for citizens to exercise, relax and recreate. At the same time, it helps the designers and builders of mountain trails understand the content and requirements involved in the landscape planning and design of mountain trails from all levels better, so as to build a more reasonable, beautiful scenery, more human-friendly mountain trail for the citizens (Zhang and Tang 2017).

### 1. Forming a perfect trail system

Repairing the connecting roads between the mountain trail, marking the route with signs, and increasing the space of entrance and exit, so as to strengthen the connection between two trails and facilitate the activities of hiking,

and sightseeing and relaxing for tourists (Zhang and Guo 2016).

## 2. Highlighting distinct trail characteristics

A. Respect the characteristics of the original terrain, retain height difference of the original site in design and make full use of it. Through stairs, the sites of different elevation can be connected, and the abundant elevation difference is used to separate the dynamic and static activities, so as to avoid mutual interference and form a landscape space with mountain characteristics.

B. Make full use of the current site, according to the physiological and psychological needs of tourists, set up activities and recreational space, in order to reduce the difficulty of hiking on the original trail, meet the needs of tourists, provide tourists with beautiful scenery, easy hiking, safe and comfortable recreational trails.

C. Perfecting all kinds of public facilities.

D. Combining with the setting of environmental art facilities to reflect the relaxed and comfortable environment of the trail.

## 3. Vegetation Planning

The original vegetation of the trail is better, with shady trees and rich plant species, but the landscape characteristics formed by vegetation are not obvious. The current greening situation of trails can be roughly divided into three sections: urban section, mountain section and rural section. The pavement of urban section is adjacent to the city, and the surrounding development density is relatively high, there are a large number of urban housing, lack of greening; the surrounding development density of rural section is low, and there are some farm houses. The terrain is terraced, with patches of farmland, a small amount of fruits and vegetables, and some sparse forests. The mountain section is in the natural forest area, with scattered buildings embellished therein. There are abundant plant species, ancient trees are towering, green and full of wild interest.

The vegetation construction in different sections can make the plant landscape characteristics of different sections more obvious and prominent. The plant landscape transits from city to country and then to mountain. Tourists' feelings are also moving from city to nature, and their body and mind are gradually relaxed effectively. Planning of vegetation in different sections is as follows:

### A. Urban section

The plants in this section are combed, reserved and replanted, and the disorderly planting is combed. The trees are kept as far as possible, the disorderly shrubs and ground cover are cleared up, and the plants are replanted to increase the greening amount in this section. Because of the less vegetation in the entrance section, fast-growing plants should be selected to quickly restore the natural environment. The main plant species are landscape plants which are commonly used in cities. They should be matched with small flowering trees to attract more people to enter. In order to better connect with the city, near-urbanization is adopted for planting.

### B. Rural section

This section retains the original "terraced" landscape features, planting rural plants to form a flower garden, so that visitors can experience the pleasure of rural pastoral. With rapeseed flowers as the main ingredient, some plants such as Dayexian Fescue, Yingchun, Ladder Grass and Bermuda Root are added to reflect the rural interest.

### C. Mountain section

In order to maintain the original landscape characteristics, this section of the trail uses ecological methods and combines with wild plants to create the nodes, so that tourists can fully experience the wild interest of the mountains and forests here without destroying the original mountain body and vegetation. Vegetation should be maintained in the present situation, and some plants with wild interest such as *Phyllostachys oblongata*, *Bamboo*,

Umbrella, Reed Root and Diaozhu should be replanted appropriately.

#### 4. Building Public Facilities

Five types of public facilities are designed as follows:

A. There are three types of signboards: road signs, signboards and maps. It is marked in many languages, dark brown in color, wood-like material and stone are used.

B. The garbage can has two types, recyclable and unrecyclable. The color is dark brown and the material is wood-like.

C. Rebuilding public toilets at the entrance of the trail, combining with greening, and designing them as earth-covered toilets. Modern materials and techniques can be used for construction, but the whole outlook should be in harmony with the primitive style of the trail.

D. Lighting facilities, recreation facilities and safety protection facilities can be made of wood, stone or a combination of both materials. The color can be dark brown or reddish brown.

E. Setting up environmental art sketches with the theme of sightseeing, leisure and entertainment (Tao et al. 2016). In addition, the entrance square has a fitness venue close by, which is equipped with some health facilities, such as leg massager, Taiji massager, space walker, arm strength training equipment.



Fig. 1 Graphic and effect photo of humanized art design for part of the ecological landscape of the mountain trail. Various recreational facilities are set up, such as lounge, leisure tree array, tables and chairs, to meet the need of various activities of visitors and residents. A gymnasium equipped with fitness equipment has been set up, which serves not only the tourists who climb mountains, but also the residents around them. Based on the above, the humanized art design of the ecological landscape of the mountain trail is completed.

### III RESULTS

It is necessary to evaluate the humanized art design of the ecological landscape of the mountain trail in this paper to ensure that the ecological landscape of the mountain trail designed by this method meets the requirements of the horizon.

Landscape evaluation is based on the intuitive cognitive process of land use or land cover. The evaluation of its visual quality and visual depth (visual field) has gone through the process of the evaluator's induction, which is beyond the specific physical image. The psychological reaction obtained has a profound impact on the quality and satisfaction of people's tourism experience. Its conclusion has a profound impact on the planning and design of scenic road.

The so-called horizon refers to the evaluation score of the viewer's sense of landscape depth in a certain direction

in the left, right or front of an observation site. It is the subjective judgment of the viewer's sense of visual depth in that direction. Generally divided into three levels, near, middle and far.

Fig. 2 can be obtained by combining the left, right and front directions of visual quality and visual depth, which represent the coordination relationship between the three directions of visual quality and visual depth respectively. From Fig. 2, it can be seen that high visual quality can be easily obtained from mid-range and short-range horizons when viewed from left and right sides.

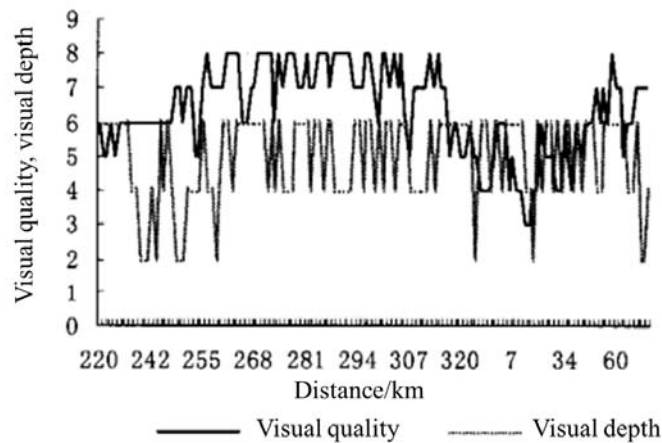


Fig. 2 Comparison of visual quality and visual depth in front of ecological landscape of mountain trail

The above results indicate that in the planning of scenic trail, the depth of field of the left and right sides of the visual landscape should be kept at the level of mid-distance and close-distance as far as possible, and the depth of field in front of the driver should be kept at the level of long-distance. From the perspective of acceptance psychology theory, fast travelers need a wide field of vision in front to feel comfortable and safe, while the scenery on the left and right sides has visual comfort at mid-distance, and part of the close-range vision can give the observer a clearer image, but if the close-range vision is too concentrated, it is easy to produce a sense of oppression. For the far horizons on both sides, too far scenery will weaken the level of information transmission to the viewers, which cannot achieve the purpose of more complete information dissemination.

#### IV DISCUSSION

On the basis of Ye Liang's research, this paper completed the humanized art design of the ecological landscape of the mountain trail. With the construction of the mountain trail system, the relationship between the trail and the city will become closer. It will take more responsibility for the citizens' daily fitness and relaxing activities, and the city's lifestyle will be brought into the trail. The future development of trails may be linked with green corridors and pedestrian systems within the city, and form a green pedestrian traffic system around the whole city. This paper has not touched on this point, which will be the direction of future research.

#### V CONCLUSION

The ecological landscape of mountain trail is an important part of the landscape system of garden green space. It is an effective means to improve the urban ecological environment and increase the city's beautiful landscape. It is widely distributed in the urban green space, closest to the residents and most frequently used by the residents. As a part of the mountain environment, the trail is set in the mountain stream. Therefore, when designing the

landscape, it should be considered together with the surrounding environment and even the whole urban environment. An ideal residential environment will provide people with a comfortable leisure space.

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