

Research on Landscape Planning and Design Strategies for Habitat Environment in Combined Urban and Rural Areas

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ABSTRACT

The urban-rural interface is a special zone formed in urban expansion with unique and typical landscape characteristics. With the increase in urbanization rate in Yunnan Province, the spatial expansion of Yunnan counties has been accelerated significantly. Thus, the urban-rural combined area shows rapid changes in land use, landscape environment, and population migration, presenting a high degree of uncertainty and complex system characteristics and becoming a typical spatial complex system. The landscape of urban-rural combined areas in China is characterized by fragmentation, mixing, and disharmony. The urban-rural combined area in Yunnan County mainly covers the spatial environment of agricultural production (or farming), industrial processing, transportation, and consumption. In the landscape planning and design of the combined urban and rural areas, careful consideration should be given to spatial production, sustainable ecological effects, the evolution of local cultural genes, and the inheritance of landscape values of the townspeople. Based on the environmental quality of urban and rural areas, this paper discusses the optimization strategy of landscape planning and design of human settlements from the ecological landscape function level. The purpose is to grasp the common understanding of the landscape construction of human settlements in urban and rural areas and to provide valuable reference for the landscape planning and design of urban and rural areas in China.

Keywords: Habitat, Landscape planning, Design strategy.

1. INTRODUCTION

With the continuous advancement of urbanization, the urban-rural fringe, a vital area where cities and rural areas meet, bridges urban and rural development.

2. ANALYSIS OF THE LANDSCAPE QUALITIES OF URBAN AND RURAL SETTLEMENTS

In the urban-rural fringe has become one of the key strategies for achieving sustainable development and rural revitalization. How to create a human settlement environment suitable for living, working, and traveling in the urban-rural fringe has become the focus of scholars and plan designers. In a comprehensive analysis of the landscape qualities of the urban-rural interface, it is first necessary to understand its intrinsic structural characteristics.

These characteristics not only determine the landscape's current state but also profoundly impact its future development direction. Starting from the instability of the landscape structure, we will gradually explore the marginality of the landscape elements and the diversity of landscape types and reveal how these qualities together shape the unique landscape of the urban-rural interface.

2.1 Instability of the Landscape Structure of the Habitat

Due to its vast development potential and relatively low land use costs, the urban-rural interface has become an area that can be developed and built upon at any time. This dynamism transforms land use patterns and landscape sections significantly faster, leading to a high degree of uncertainty in the landscape pattern. This uncertainty not only has a profound impact on the

overall structure of the landscape but also significantly reduces the stability of the habitat landscape and increases the complexity and difficulty of planning and management. Therefore, landscape planning for the urban-rural interface needs to focus more on flexibility and adaptability to cope with its rapidly changing characteristics.

2.2 Marginality of Habitat Landscape Elements

Frequently and distinctive interactions exist between the various types of habitat landscape units within the rural-urban interface. The primary manifestation of this is the conflict between the industrial and built landscape systems and the countryside's farmland and natural landscape systems. The urban and rural residential land, production land, and construction land in this area intersect each other, showing a significant edge effect. This edge effect reflects the complex interaction between different landscape units and reveals the uniqueness and complexity of the urban-rural combination in terms of land use and landscape pattern.

2.3 Diversity of Habitat Landscape Types

As a transitional zone, the urban-rural combination area has taken over the proliferation of urban elements and, to a certain extent, retained the original rural land-use pattern. Various artificial, natural, and semi-natural landscapes are integrated into this area, forming a unique landscape pattern. This integration reflects the diversity and complexity of the urban-rural interface and demonstrates its essential role in the urbanization process.

2.4 Complexity of Habitat Landscape Functions

Because of its unique geographical location, the human environment landscape in the urban-rural combination area has the dual function of urban landscape and rural landscape. This dual function is manifested in the complex blend of production, greening isolation, beautification, and ecological protection functions. Through the joint action of these multiple functions, the urban-rural interface has formed a highly dynamic and diverse landscape system that not only meets the needs of production and life but also plays a role in ecological protection and environmental beautification.

3. COUNTERMEASURES TO OPTIMIZE THE LANDSCAPE OF THE HUMAN ENVIRONMENT IN THE URBAN-RURAL COMBINATION OF THE COUNTY

The purpose of the landscape design of the human environment in the combined urban and rural areas of the county is to alleviate the environmental pressure brought to the region by the development of modern cities and to improve the problems existing in the existing landscape design to realize the harmonious development of the landscape design of the public activity space in the combined urban and rural areas. The main optimization countermeasures are divided into the following aspects: landscape is functional and personalized. In the landscape design of human settlements in urban and rural areas, it is necessary to focus on the improvement and personalization of landscape functions and consider the overall infrastructure improvement in the region.

3.1 Landscape Is Functional and Personalized

In the landscape design of human settlements in urban and rural areas, it is necessary to focus on the improvement and personalization of landscape functions and consider the overall infrastructure improvement in the region. Because of the relative concentration of the active population in this area, it is necessary to strengthen the greening of the landscape. Greening can play a protective role, and it can also be done by planting evergreen plants to provide residents with the essential services of wind and rain. An ample green space should be reasonably planned and set up for residents' recreation and leisure, which will play the function of purifying the air and beautifying the environment. In addition, resting facilities in public activity spaces should be fully considered and reasonably configured, such as benches, pavilions, and drinking water facilities, to meet the diversified needs of residents but also attract residents to participate and stay and fully reflect the comprehensive value of landscape design.

3.2 Respecting the Terroir and Passing on the Culture

The landscape design of urban and rural human settlements should continue the original history and culture of the city and preserve and promote them through design. In the landscape design of urban

and rural human settlements, respect for local customs and heritage culture is crucial, which not only helps to maintain techniques[1].

First of all, designers can incorporate elements with local characteristics into the design so that the landscape design echoes the local culture through an in-depth understanding and research of the historical background, cultural traditions, and customs of the area, including detailed investigation and analysis of local architectural styles, traditional crafts, folk activities, and historical sites. Secondly, historical and cultural heritage should be skillfully preserved and displayed in landscape design. For example, the historical memory of the region can be preserved by restoring and repairing historical buildings and setting up cultural display areas or monuments. At the same time, cultural walls, sculptures, bas-reliefs, and other artworks can be installed in public spaces to display local historical stories and cultural symbols. In addition, the design should also focus on the combination of tradition and modernity. While retaining historical and cultural elements, modern design concepts and technologies should be incorporated so that the landscape design has a sense of historical weight and meets modern people's aesthetic and usage needs. For example, based on traditional architectural style, modern materials and techniques can be used to enhance the functionality and comfort of the building. Finally, the design should emphasize community participation and public education. Residents should be encouraged to participate in landscape design and maintenance by organizing cultural activities and community workshops to understand and identify with the local culture better. At the same time, visitors and residents can be introduced to the history and culture of the area through the installation of information boards and guide systems to enhance their sense of cultural pride. Landscape design of human settlements in urban and rural areas should, based on respecting local customs and inherited culture, continue and carry forward the lives, and culture of the city through in-depth research, skilled design, a combination of tradition and modernity, and community participation, to make the landscape design not only have local characteristics but also satisfy the needs of the modern people's live.

3.3 Advocating Savings for the Long Term

In the favorable land of the rural-urban interface, advocating conservation and being based on the

long term are crucial principles. Its unique geographical advantage determines the relatively low cost of landscape design in all aspects at a later stage, which provides favorable conditions for implementing sustainable ecological design. Keeping up with the trend of the times and taking sustainable development as the core concept, landscape design is carried out based on respecting the original natural environment, enriching the public activity space of the urban-rural combination through diversified landscape treatment methods, and ultimately realizing the strategic goal of harmonious ecological development. Saving resources and reducing costs are essential in landscape design for urban-rural combination areas. Designers should fully use local natural resources and terrain conditions to reduce the dependence on external resources. For example, local plants can be used for greening, and natural terrain can be utilized for water management, thus reducing construction and maintenance costs. Respecting and protecting the original natural environment is the key to sustainable development. In the design process, existing natural landscapes, such as rivers, wetlands, and forests, should be preserved and protected as much as possible. At the same time, through scientific planning and design, the damage to the natural environment should be reduced, and the ecological balance should be maintained. Biodiversity can be protected by setting up ecological buffer zones and building ecological corridors. Diversified landscape treatment techniques can enrich the public activity space in the urban-rural combination and improve the residents' quality of life. Designers can design different public spaces, such as leisure parks, sports grounds, and cultural squares, according to different functional needs. These spaces can not only meet the residents' daily activity needs but also enhance the aesthetics and attractiveness of the area through roofs and beautiful landscape design.

In realizing the strategic goal of harmonious and ecological development, designers should focus on the implementation and execution of ecological design concepts. For example, ecological design techniques such as rain gardens, green roofs, and permeable paving can promote rainwater's natural infiltration and circulation and reduce the urban heat island effect. At the same time, energy consumption can be reduced by installing renewable energy facilities, such as solar panels based on wind turbines, to achieve sustainable energy use[2]. The landscape design of the urban-rural combination should make full use of its

geographical advantages and follow the trend of sustainable development under the principle of advocating conservation and basing it on the long term. Respecting the original natural environment enriches the development[3].

4. ANALYSIS OF THE DESIGN PRINCIPLES OF THE LANDSCAPE OF HUMAN SETTLEMENTS IN URBAN AND RURAL AREAS

After clarifying the characteristics of the habitat landscape at the urban-rural fringe, the next step is to explore its design principles. These principles are the basis for guiding landscape planning and design and the key to ensuring regional sustainable development. We will start from the design principle of integration with the natural landscape, gradually analyze the intersection of the agricultural landscape and other settlements, and comprehensively explain how to optimize the habitat landscape at the urban-rural fringe through scientific and reasonable design.

4.1 The Combination of Human Settlement Environment Landscape and Natural Landscape

The formal integration of modern landscape design and natural environment is the integration process of artificial and natural landscape design. This design process requires an in-depth reflection of the interpenetrating and integrating relationship between the two. Therefore, landscape design should be based on ecological design aimed at sustainable development and be committed to protecting and restoring natural landscapes to realize the harmonious coexistence of the city and the countryside in urban-rural integration. In terms of specific design techniques, the principle of gradual and orderly progress should be followed to avoid the phenomenon of rawness and dullness and to ensure that it is in line with the natural aesthetics principle of the colorate design of the public activity space in the urban and rural areas. The design should pay special attention to the collocation of plants to enhance the beauty of the forest crown line and the change of the forest edge line to enrich the level and color of the landscape and to avoid the monotonous and complex effect. Designers need to consider the seasonal changes of plants, carry out scientific color planning, and fully understand the growth habits of plants in order to

create a natural and ecological landscape of public activity space in combination. Designers should choose suitable local statistics to build a multi-layered and diversified landscape. A beautiful landscape with seasonal changes is formed through reasonable plant configuration and color matching to enhance the area's ecological and aesthetic value. At the same time, the natural terrain and hydrological conditions should be fully utilized to maintain facilities such as rain gardens and permeable paving to spaces[4]. For example, multi-functional spaces such as leisure parks, sports grounds and cultural squares can be designed to improve residents' quality of life and happiness. The combination of modern landscape design and natural environment should be based on ecological design, with sustainable development as the goal, focusing on protecting and restoring natural landscapes and realizing the harmonious coexistence of cities and villages in urban-rural integration. Through gradual design techniques, avoiding rigidity and dullness, following the principles of natural aesthetics, and focusing on the matching of plants and changes in the seasons, a colourful, natural and ecological landscape of public activity space in the urban-rural integration area is created.

4.2 The Landscape of Human Settlement Environment Intersects with the Landscape of Agriculture

Rural landscape, as a rural landscape type, in the design process, not only needs to be integrated into the daily lives of the residents but should also abandon the traditional and eliminate space[5]. In the specific design, it is necessary to comprehensively consider several factors, including skyline design, urban and rural edge space design, and plant canopy design. The skyline design should emphasize harmony and unity with the natural landscape, avoiding damage to the natural environment and enhancing the overall beauty of the landscape. The design of urban-rural fringe space should emphasize the naturalness and gradual change of transition, accent boundaries, and promote the organic integration of urban and rural landscapes. The design of the plant canopy line should fully consider the landscape characteristics of plants and seasonal changes and form a landscape effect with rich layers and diverse colors through scientific plant configuration. The design should also pay attention to ecological sustainability, enhance the ecological function of the landscape, and improve the region's

environmental quality by introducing eco-friendly design techniques, such as rainwater management systems and ecological buffer zones. At the same time, the design should pay attention to cultural heritage and the embodiment of local characteristics and give the landscape unique cultural connotations by excavating and inheriting the historical and cultural elements of the countryside. Rural landscape design should seek innovation and breakthroughs by abandoning traditional design forms based on integration into daily life. By comprehensively considering various factors such as skyline, urban, and rural edge value[6].

4.3 Habitat Landscapes in the Rural-Urban Interface with Other Settlements

Modern cities' growth and spread to neighboring areas have blurred the boundaries between cities and villages. Often, these areas are demarcated by the main roads of the city. Therefore, the design of such landscape spaces is mainly based on meeting basic needs and emphasizing safety. As urban arterial roads have large extensions, landscape design usually unfolds along the flowers of the road. It is differentiated according to different needs to enhance the landscape's ornamental nature while providing flowers, and protection. In the specific design, the landscape is spatially created through the interplay of trees, shrubs, flowers, and ground cover plants. Tall trees can form protective forests and play the role of barrier and protection, while shrubs, flowers, and groundcover plants are mainly used to enrich the space's color and beautify the environment. The landscape design of this area pays more attention to ecological protection. It enhances the area's environmental quality and ecological value through scientific plant configuration and ecological design techniques. If a river crosses the space, the space on both sides can also be developed to form a public activity space shared by urban and rural areas. Through rational planning and design, trails, recreational areas, and green belts can be set up on both sides of the river, which not only enhances the diversity and beauty of the landscape but also provides residents with places for recreation and leisure and promotes the interaction between human beings and nature. The landscape design of the combination of modern city and countryside should be based on meeting basic needs and social value, creating a colorful landscape space through the scientific configuration of trees, shrubs, flowers,

and ground cover plants. At the same time, pay attention to ecological protection and environmental beautification to enhance the ecological value of the environment [7].

5. STRATEGIES FOR OPTIMIZING THE LANDSCAPE OF URBAN-RURAL SETTLEMENTS

More landscape management needs to be done in the urban-rural areas of China. There are contradictions between rapid urbanization and modernization and the protection of culture, environment and resources. The combination of urban and rural areas is volatile, the landscape changes frequently, and the management is difficult to implement, which is specifically manifested in the poor effect of the overall urban landscape, such as the loss of humanities and traditions, the spatial spread of disorder, and the destruction of the ecological environment, which leads to the problems of "one side of a thousand cities" and the convergence of landscapes. The most fundamental reason is the neglect of design and self-generation in the coordination of landscape planning. The fundamental reason for this is that the coordination and optimization of design and self-generation in the landscape planning of urban-rural integration is neglected. When dealing with these problems, we can learn from the experience of the West, but we should refrain from copying its model. We should study and explore the theory and design method of landscape planning for urban-rural combinations with Chinese characteristics. By combining the actual situation in China, we can formulate a landscape planning strategy suitable for the local area to realize the sustainable development of the urban-rural combination and improve the human environment.

5.1 Attaching Importance to the Theoretical Research on Landscape Evolution Laws and Optimization Methods in Urban-Rural Areas

The urban-rural interface is an essential indicator of sustainable urban and rural development. A sustainable urban-rural interface landscape should be symbiotic with the environment, adapting to the order and law formed by the long-term accumulation of the regional environment while meeting the various needs of modernization and development. Landscape planning and design is the primary materialized

means of urbanization implementation and plays a critical or methodological role in forming and evolving the urban-rural combined landscape. However, in the planning and design, there needs to be corresponding theoretical research and analysis on the autogenous evolution mechanism of the landscape. Therefore, theoretical, methodological, and empirical studies based on landscape evolution laws and optimization methods in urban-rural areas are essential. The geographical process of landscape can characterize the spatial and temporal pattern of urbanization and the cultural vein and provide a basis for constructing China's landscape language system. Taking the geographic process of urban landscapes as the research object, analyzing the interaction mechanism between tradition and modernity in the formation and development of landscapes, objectively evaluating the health standards of urban-rural landscapes in terms of cultural, economic, ecological, and social effects, and proposing operable optimization modes and regulation techniques for urban-rural landscapes are of great significance for the optimization of the landscapes in the urban-rural areas.

5.2 Autopoiesis and Design Linkage Are Important Parts of Landscape Optimization in Urban and Rural Areas

The optimization of the landscape in the urban-rural combination is a process of autogenous and design-combined development. As a stage guidance and control of landscape design, it should be compatible with the self-generated landscape characteristics and patterns. This model of composite development of autopoiesis and design can not only effectively realize the effectiveness of government intervention but also provide timely feedback on the cultural and emotional demands of the residents, which is a dynamic and synergistic model of healthy development. Studying the autochthonous features and patterns in the landscape development of urban-rural integration, regulating the rules and management of landscape design in urban-rural integration, and establishing a synergistic regulatory mechanism between the two are essential aspects of optimization. Macro-intervention in the development of urban-rural areas through the use of planning control, construction management, and other organizational means may have two effects on the process of landscape evolution: firstly, when the planning and design are coupled with autonomous mechanisms, it can promote and accelerate the evolution and

sustainable development of the landscape of urban-rural areas; secondly, when the planning and design deviate from the autonomous mechanisms, it will hinder the evolution and healthy development of the landscape. Based on the systematic, dynamic, and complex evolution of the landscape in the urban-rural fringe, it is essential to explore the complex linkage and evolutionary autopoiesis mechanism between planning and design. Through scientific and effective urban management, we can correct and guide the future development direction and form a complex optimization model of landscape autopoiesis and design in the urban-rural fringe. It will provide theoretical guidance and practical solutions for reforming the planning and management system of the urban-rural fringe in Chia and a solid foundation for the sustainable development and optimization of the human settlement environment in the urban-rural fringe.

5.3 Implementation Guarantee of Landscape Optimization in Rural-Urban Fringe

The synergistic optimization and control of the landscape in the urban-rural combination is a whole-process guidance and control method throughout the construction and development of urbanization, which involves many aspects, including the selection of the resource development mode, the debugging of the urbanization path, the repair of the landscape spatial and temporal veins, the artistic design of the landscape elements, the monitoring and modification of the landscape patterns in the critical sections, as well as the extraction of the regional cultural characteristics and the excavation of the central values, and so on.

6. CONCLUSION

Landscape design for urban and rural settlements is crucial to sustainable urban development. In order to achieve this goal, it is necessary to follow existing policies, give full play to social participation, draw on both successful cases and failed experiences, and develop more scientific planning principles. By scientifically allocating plants, focusing on ecological protection and environmental beautification, and utilizing river space to create public activity areas to promote sustainable development and habitat improvement, we can effectively deal with the problems of cultural loss, spatial disorder, and ecological damage caused by lagging landscape management in urban-rural areas. Studying

landscape planning theories and methods with Chinese characteristics, dynamically guiding and synergistically optimizing the landscape of the urban-rural interface, and realizing the coupling of autochthonous laws and design regulation are essential guarantees for improving the quality of residents' lives. Ultimately, this will help to realize the harmonious symbiosis between cities and nature and provide a sustainable ecological foundation for future urban development.

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