

Recommendations for Landscape Design of Traditional Ethnic Minority Villages in Hunan Province

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Abstract With the rapid development of China's economy and the government's issuance of a series of rural revitalization strategies, the design of rural landscapes has garnered increasing attention. However, some rural landscape designs have become more urbanized, neglecting the natural ecology, distinctive characteristics, and cultural heritage of rural areas, leading to a homogenized phenomenon. To address issues such as landscape homogenization and cultural erosion in traditional villages, this paper analyzes the current status of ethnic minority village landscapes and integrates landscape design principles to propose design strategies for rural landscapes in traditional ethnic minority villages in Hunan Province. It is intended to better achieve the construction of rural landscapes in traditional ethnic minority villages in Hunan Province.

Key words Ethnic minority villages, Landscape design, Design strategies

0 Introduction

Accompanying with China's economic development, rural lands that carry profound cultural heritage are undergoing gradual transformation. The spatial distribution of ethnic minority traditional villages in Hunan Province exhibits distinct regional patterns; more concentrated in the western regions than the east, predominantly in mountainous areas over plains/lake areas, and largely rural rather than urban. Most settlements demonstrate a "large mixed settlements with small concentrated communities" distribution pattern. Topographically, villages are primarily situated on mountain slopes, with a minority located in river valleys, forming a characteristic "one mountain, one ridge, one village" scattered distribution. Ethnic minorities are mainly distributed across mountainous regions marked by complex terrain, numerous steep canyons, infertile soil, poor transportation infrastructure, harsh natural conditions, widespread poverty among mountain tribes, and low social development levels. These geographical constraints have collectively shaped the distinctive heterogeneity of rural ethnic landscapes. As rural economies advance and populations grow, traditional settlement patterns increasingly fail to meet modern living demands. Consequently, future design interventions must holistically balance the preservation of original village spatial configurations with enhanced accessibility for contemporary rural lifestyles.

1 Research status of landscape design of traditional villages of ethnic minorities in Hunan

With the increasingly prominent hierarchical system of re-

gional cities, most rural areas have gradually become marginalized. This trend has inevitably weakened the long-standing connection between local communities and their land, while drawing greater attention to the rural landscape environment. Current domestic research on the current status and strategies of traditional rural landscapes are primarily manifested in the following aspects. Scholars such as Sun Lin *et al.* [1] and Yu Jia *et al.* [2] have explored issues including environmental degradation of rural landscapes, rigid structural patterns, disconnection between architecture and cultural heritage, and declining landscape culture. Their proposed strategies emphasize protecting natural environments, maintaining ecological balance, optimizing structural models through context-sensitive development, enhancing site-specific landscape characteristics, and fostering distinctive regional cultural identities. For another example, Yang Yadong *et al.* [3] and Xie Qian *et al.* [4] applied bibliometric analysis and CiteSpace software to investigate traditional village landscapes. Based on the formation of composite rural landscapes under rural industrial integration, they advocated for coordinated development between rural industries and landscape systems, while summarizing four major development paths for traditional village landscape: "traditional villages→cultural landscapes-Western Hunan Province-spatial production", "rural revitalization-driving mechanisms-human settlements-landscape genes", "ancient villages-heritage tourism-sustainable development-conservation and utilization", and "landscape architecture-landscapes-village culture→suitability evaluation". Liu Peilin *et al.* [5], taking Zhangguying Village in Yueyang City of Hunan Province as a case study, investigated the gradual disappearance of vernacular architecture, clan culture, and traditional folk customs from the perspective of genetic digital communication in rural landscapes. Their research proposes revitalization strategies through employing digital technologies to deeply mine and utilize regional cultural resources, while strengthening the maintenance and governance of human settlements, thereby infusing new vitality into rural development with the aim of achieving sustainable rural landscape evolution [6]. As an integrated system

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encompassing agricultural, natural, cultural, and settlement landscapes, the analysis of Hunan's ethnic minority rural landscapes is conducted through three dimensions: natural ecology, agricultural production, and cultural distinctiveness, synthesizing comprehensive rural landscape visions while addressing the present practical challenges.

1.1 Imbalance of natural ecological landscape From a geographical perspective, ethnic minority groups in Hunan predominantly inhabit remote mountainous areas encompassing the Wuling, Xuefeng, Nanling, and Luoxiao mountain ranges. These settlements are primarily concentrated along border regions adjacent to neighboring provinces, forming a distinctive belt extending north-west to south. These mountainous regions not only serve as nationally significant ecological function reserves, but have also cradled spectacular natural formations including the Zhangjiajie sandstone landform, Danxia landforms, and karst topography—each constituting a unique distinctive natural landscape of remarkable local character.

For the construction of rural infrastructure including transportation, electricity, and water conservancy systems, many collective villages have to be relocated^[7], increasingly exposing mountainous terrains and water bodies to anthropogenic influences. A representative case emerges in Xiangxi Autonomous Prefecture, where traditional settlements have been relocated closer to highways as part of collective poverty alleviation measures. This spatial reorganization has resulted in abandoned ancestral farmlands and unmanaged forests at original settlement sites (Fig. 1), triggering ecological degradation. Formerly verdant slopes now exhibit vegetation depletion and soil erosion, while compromised retaining walls and dysfunctional protective structures, which are exacerbated by mining practices involving blasting techniques, have intensified geological hazards including landslides and debris flows. Furthermore, post-poverty eradication industrial initiatives prioritizing economic benefits (low-cost land, labor, and rapid production) are being implemented but with environmental considerations neglected^[8]. The particular concern is soil and water contamination from improper wastewater treatment, along with altered riverine hydrology due to excessive sand extraction, both critically disrupting ecological balance^[9]. This ecological degradation is manifested as systemic imbalances in natural landscape integrity, undermining the sustainability of rural revitalization efforts.

1.2 Low utilization rate of agricultural production landscape Rural economic development constitutes a multifaceted system primarily sustained by agricultural sectors including crop cultivation, animal husbandry, agro-processing industries, and agricultural services. These interconnected industries not only form the solid economic foundation but also shape distinctive rural productive landscapes. Anchored in the historical agrarian adage "When Huguang (Hunan and Hubei) harvests, the whole country will be prosperous", Hunan's rural development leverages its profound agrarian cultural heritage by strategically integrating local ecological resources with modern technological interventions to

promote balanced growth across primary, secondary, and tertiary agricultural sectors^[10]. However, persistent reliance on extensive agricultural practices presents systemic challenges. Excessive dependence on novel production inputs has degraded both productive landscapes and crop genetic integrity, resulting in: (i) progressive loss of arable land productivity, (ii) severe contamination of atmospheric and aquatic production factors, and (iii) accelerating land degradation processes. This ecological deterioration critically undermines rural economic sustainability. In ethnic minority regions, paradoxical conditions prevail, and abundant land resources coexist with economic underdevelopment and severe labor migration. Consequently, vast rice terraces lie fallow due to cultivation abandonment, while dispersed settlements and underutilized land parcels (Fig. 2), leading to very low utilization rate of agricultural productive landscapes^[11].

1.3 Loss of cultural characteristic landscape Regional distinctiveness serves as the defining characteristic differentiating rural villages. This spatial identity is manifested through cultural elements embedded in rural landscapes, encompassing traditional customs, folk practices, lifestyle patterns, and production particularities. The minority areas in Hunan, mainly inhabited by Tujia, Miao and Dong ethnic minorities, have formed their own unique settlements by virtue of their unique blood ties, and have accumulated profound and unique cultural connotations. These rural landscapes show distinct regional differences in the layout of settlements, the form and material of buildings, and the decoration of villages. However, with the acceleration of urbanization and the increasing frequency of information exchange, the rural landscape is gradually changing. Natural landscape is gradually transformed into artificial landscape, traditional costumes are replaced by ordinary clothes, and primitive residential buildings are gradually replaced by bungalows^[12]. Due to poor ventilation, lighting and drainage conditions, most of the traditional residential buildings with a long history have been idle for a long time, and few people live in them (Fig. 3). They are gradually collapsed, tilted, chaotic and overgrown with weeds. It is regrettable that the professional craftsmen for the repair of ancient buildings are gradually lost, resulting in the failure of timely protection and restoration of the buildings; many architectural decorations and landscape works with local characteristics are gradually disappearing, consequently, the landscape transformation of traditional villages loses its soul support, and also the local culture with unique charm gradually loses its material carrier^[13].

2 Design principles of landscape of traditional villages of ethnic minorities in Hunan

The minority regions of Hunan Province possess a distinctive natural ecology, ethnic culture, and regional architectural foundation. Natural villages and towns clinging to mountainous terrains, along with architectural styles reflecting diverse ethnic cultures and lifestyles, all serve as tangible representations of how unique natural landscapes and historical humanistic elements shape the

human living environment. The geographical diversity and complexity fundamentally determine that landscape design in the Huxiang region must adhere to principles including sustainable development of economic ecology, inheritance of cultural characteristics, and adaption to local conditions.



Picture source: photoed by the author, the same below.

Fig.1 Abandoned land in western Hunan



Fig.2 Scattered agricultural land with low utilization rate



Fig.3 Gradually declined architecture of Miao village

2.1 Principle of coexistence of ecology and economy Rural construction, as a core component of building a beautiful China, not only shoulders the crucial responsibility of promoting the con-

struction of ecological civilization, but also serves as the key to enhancing the development level of socialist new countryside construction. In this process, rural landscape design should not only harmoniously integrate with the natural environment, but also closely align with the integrated development needs of local industries, working together to build a beautiful and livable new rural landscape^[14].

2.1.1 Ecological principle. Farming civilization forms the foundation of traditional Chinese village civilization, with agricultural production serving as the primary economic development model. The Huxiang region enjoys unique natural ecological advantages, possessing both abundant mountain-water-field resources and scarce ecological assets^[15]. As the national planning for major functional zones and ecological function areas progressively advances, ecological environmental issues triggered by the development of hydropower and mineral resources in Hunan's ethnic minority regions have gradually emerged, which attracts widespread societal attention. Particularly in ecologically fragile areas, along with resettlement challenges arising from engineering projects, the proper resettlement of displaced populations and the construction of new living settlements have become crucial links in coordinating human-land relationships. Therefore, when conducting landscape design in Hunan's ethnic minority regions, adherence to ecological principles is essential to ensure design schemes harmoniously co-exist with the natural environment, preserve local ecological equilibrium, and maintain the sustainability of traditional ethnic village landscapes^[16].

2.1.2 Economic principle. The rapid economic growth of China has infused vibrant development vitality into the ethnic minority regions of Hunan Province, vigorously propelling the industrialization and urbanization processes in these areas. During this progression, the relationship between population and cultivated land (scale of cultivation) has undergone significant transformations, exerting profound impacts on the spatial forms and distribution patterns of ethnic settlements. With population growth and mobility, the spatial morphology of ethnic settlements has gradually manifested diversified and complex trends, while changes in cultivation scale directly influence the distribution patterns of these communities. As important carriers of agrarian culture, traditional villages in Hunan's ethnic minority regions demonstrate a close connection between their industrial development and rural landscape design. In advancing the integrated development of rural industries, the landscape design of traditional villages requires deep integration with local industrial characteristics to foster diversified industrial economic growth^[17].

2.2 Principle of cultural inheritance and regional cultural distinctiveness The unique natural landscapes and historical culture of traditional villages undoubtedly constitute their fundamental distinguishing elements from other regions. Historical heritage, folk customs, and living traditions, as distinctive and precious treasures of rural areas, hold profound significance in enhancing local residents' cultural confidence and developing rural tourism through their exploration, protection, and utilization^[18]. In Hunan's traditional villages, both local gentry and common people were deeply versed in the ways of aesthetic edification, skill-

fully integrating these elements into architectural details of residential dwellings, such as beams, wooden columns, window lattices, flooring, and furniture through carved, painted, or inscribed images and texts rich in aesthetic enlightenment. These artistic expressions not only convey their aspirations for wealth, prosperity, happiness, and joyful living, but also serve as vivid carriers of local historical culture^[19]. Therefore, in the landscape design of traditional ethnic minority villages in Hunan, it is necessary to profoundly grasp the essence of local vernacular culture, excavate the implicit cultural information embedded in historical traces, and manifest these through physical entities as cultural carriers.

2.3 Principle of integrating local adaptation with functionality Under the strategic background of rural revitalization, for the landscape design of traditional villages, we should carry out transformation and development based on thorough understanding and adaptation to local conditions, ensuring each design aligns with the local natural environment and cultural characteristics. Simultaneously, scientific and rational planning of various functional spaces must be implemented to meet villagers' living needs and enhance the overall village landscape. In ethnic minority regions of Hunan, the overall village site selection emphasizes "adaptation to local conditions," prioritizing the full and effective utilization of natural environments and pursuing harmonious integration with nature. The concept of "using mountains as screens and water bodies as ponds" vividly embodies this philosophy, where villages are encircled by layered mountain ranges, echoing the topography to form a well-proportioned, multi-layered landscape with clear spatial hierarchy^[20]. Furthermore, the functional principle remains equally crucial in rural landscape design. It must not only fulfill basic practical needs but also ensure the landscape possesses attractiveness and usability. To achieve this goal, it is essential to deeply understand the diverse needs and habits of different user groups, thereby providing appropriate facilities and spatial arrangements. In rural landscape construction, adhering to the principle of integrating local adaptation with functionality aims not only to showcase the unique regional landscape features, but also to create an ecologically balanced and biodiverse beautiful countryside.

3 Landscape design of traditional villages of ethnic minorities in Hunan

In traditional village landscape design, to maximize the utilization of village resources, clear landscape design strategies should be formulated based on the inherent characteristics of traditional villages. For the landscape design of ethnic minority traditional villages in Hunan, it is essential to fully adhere to scientific planning principles to create ecological, livable, and developmental traditional village landscapes^[21]. Within this context, the landscape design of Huxiang ethnic minority traditional villages can commence by creating an ecologically livable rural landscape environment, manifesting ecological, productive, and cultural landscapes across multiple dimensions^[22].

3.1 Adjustment methods of ecological landscape imbalance

Traditional villages in Hunan's ethnic minority regions are predom-

inantly nestled against verdant mountains and facing clear waters, with their spatial layouts forming a three-dimensional settlement panorama where "mountains, water, villages, farmland, and land" harmoniously interplay. In formulating ecological landscape design strategies for these traditional villages, full consideration should be given to local topographic features, natural water systems, landscape vegetation, and other geographical elements. Targeted design approaches should be implemented according to regional climatic characteristics to construct ecologically sound landscape spaces. This dual-focused strategy not only enhances human comfort within traditional rural landscape environments but also promotes the development of ecological sustainability^[23].

3.1.1 Construction of ecological landscape water system. Most traditional ethnic minority villages in Hunan's ethnic minority regions are constructed along mountains and adjacent to water bodies. Therefore, the creation of ecological landscape water systems requires comprehensive consideration of multiple dimensions, including water body design, ecological maintenance, and landscape beautification. In practical implementation, flexible adjustments and optimizations must be made in accordance with specific site conditions and functional requirements to achieve an optimal balance between ecological benefits and visual effects. In water body design, it is necessary to rationally plan the layout of water systems based on site characteristics and functional needs, ensuring the natural flow of water to avoid stagnant pools or excessively rapid currents. The forms of water bodies should be determined according to design objectives and site-specific conditions, taking full advantage of local natural water resources such as lakes, streams, and ponds to create diverse aquatic landscapes. Through the configuration of water-related elements such as embankments, islands, bridges, corridors, and aquatic plants, the spatial hierarchy of water surfaces can be delineated, enhancing visual depth and landscape richness. In ecological maintenance, water quality must be maintained through ecological technologies such as phytoremediation and microbial decomposition, ensuring it meets ecological standards and provides a healthy habitat for aquatic life. Diverse aquatic plant and animal species should be introduced into the water system to establish complete ecological chains and promote biodiversity development. The principle of ecological priority must be strictly adhered to, avoiding excessive development that could damage the natural environment. In landscape beautification, the construction of water systems should be organically integrated with surrounding landscapes to form a visually harmonious environment, thereby elevating overall spatial quality. Design techniques such as alternating expansive and restrained water spaces can be employed to create dynamic spatial variations, strengthening the sense of layering and interest in the landscape. Deep integration of regional cultural characteristics, along with borrowing traditional gardening techniques like borrowed scenery and opposite scenery, can enhance the cultural and artistic value of water system landscapes^[24].

3.1.2 Constructing eco-friendly spaces. A good rural landscape design should take the pursuit of ecology as the core goal, and the way of low maintenance, low cost and low technology is an effective way to achieve this goal. By integrating local natural environ-

ments and resource conditions, it maximizes the utilization efficiency of rural natural landscapes while creating comfortable and environmentally friendly spatial environments. To address the needs of diverse user groups, distinct spatial typologies should be delineated. Clear functional zoning and spatial layouts must be established, embedding ecological principles throughout the planning process. Simultaneously, natural factors such as topography and climate, as well as the behavioral impacts of both local villagers and external visitors, should be thoroughly considered to ensure the scientific validity and feasibility of the design. Within these spaces, diversified ecosystems, including green spaces, wetlands, woodlands, and others, should be established to enhance ecological stability and self-purification capacity. Through rational allocation of biological elements such as plants and animals, complete biological chains can be constructed to promote ecological balance^[26].

3.2 Optimization mode of rural productive landscape utilization rate Rural productive landscapes originate from the integration of daily life and productive labor, and the rational utilization of productive landscapes holds an indispensable position in the overall construction of rural landscapes. The most distinctive feature of agricultural plant production lies in its temporal specificity and the cyclical nature of natural change patterns^[27]. Therefore, during the process of rural landscape design, natural factors such as terrain and climate should be considered to select appropriate productive crops and landscape plants, thereby achieving optimal resource allocation. Based on production demands and land conditions, the layout of productive areas and landscape zones should be rationally planned to ensure balance and harmony between the two. Simultaneously, attention should be paid to the selection and configuration of landscape plants to enhance both the aesthetic appeal and ecological value of the scenery. Through integrating local culture and characteristics, unique landscape styles should be crafted to elevate the cultural connotation of the landscape. Damaged ecological areas require restoration and rehabilitation to recover their ecological functions and improve the overall ecological quality of productive landscapes. Guided by the strategic principles of "protection, restoration, exploration, and sustainability," and combined with the regional characteristics of ethnic minorities in Hunan Province, we must cherish and preserve local productive landscapes. This approach will not only showcase the picturesque harmony between mountains and waters, but also inherit the long-standing historical culture of ethnic minorities, manifesting the diligent and simple spirit of local communities. Concurrently, it provides novel perspectives for the preservation of traditional village landscape features in ethnic minority regions and injects new vitality into the sustainable development of rural areas^[28].

3.3 Effective inheritance of cultural landscape protection

Rural cultural construction is the soul of rural revitalization, focusing on giving full play to the advantages of rural traditional culture, integrating local human resources, showing the characteristics of rural culture, in order to highlight the unique charm of the countryside. The numerous geographical features and cultural characteristics of ethnic minorities in high mountains and valleys

in Hunan ethnic minority areas have formed a unique regional landscape. Therefore, we should grasp the core element of regional culture, excavate the local characteristic culture through landscape design, and create the unique cultural landscape characteristics of traditional villages^[29]. In traditional buildings, traditional crafts and materials should be used as far as possible to repair damaged parts, and later modifications and adjustments should be made without destroying their historical value and cultural characteristics, so as to maintain their historical value and cultural characteristics. For those buildings that have been vacant for a long time, we can create a public space for villagers to meet the diverse needs of villagers and tourists^[30]. In terms of traditional culture, we should dig deeply into the cultural resources of the countryside, combine the local cultural background and folk customs, protect and inherit the traditional handicraft and intangible cultural heritage, and make the traditional village landscape glow with profound cultural charm. In terms of the customs and habits of ethnic minorities, we combine science and technology with art, show the real scenes of rural life in an intelligent way, and increase the sense of interaction and experience between villagers and tourists. In this way, people can deeply experience the profound history and culture of ethnic minorities in China while enjoying the rural scenery.

4 Conclusions

"Though Zhou is an ancient state, its mandate is ever-renewed". In other words, an ancient nation may thrive by embracing perpetual renewal. Even villages endowed with profound historical and cultural heritage will derive their vitality from continuous renewal and development. The traditional villages in ethnic minority regions of Hunan Province bear the significant mission of "new destiny for ancient settlements." As unique landscapes nurtured by Huxiang culture, they not only preserve a multitude of intact traditional village landscapes but also demonstrate distinctive architectural forms and cultural-aesthetic values. Under the backdrop of the new era, the transformation and development of traditional villages should adhere to the principle of "honoring our origins, assimilating external influences, and orienting towards the future." In advancing village development, it is imperative to both uphold and promote the villages' outstanding traditional culture while actively integrating external advanced concepts and technologies, guiding comprehensive progress through forward-looking perspectives. Through continuously igniting the dynamism and charm of the villages' exceptional traditional culture, we can achieve all-round revitalization of traditional villages. This will infuse sustainable rural development with an enduring driving force, enabling ancient villages to radiate fresh vitality and vigor.

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