



Beihai garden expo: Cultural revival and landscape transformation study

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Received: December 30, 2024 • Revised manuscript received: April 16, 2025 • Accepted: April 22, 2025
Published online: October 1, 2025

ABSTRACT

This study aims to rejuvenate the Beihai Garden Expo Park by emphasizing the cultural value of Xiangyunsha and plant dyes through innovative design. The park will host cultural exhibitions and fashion shows to foster functional harmony and cultural exchange. In response to issues such as aging architecture and excessive vegetation growth, the renovation project will focus on cultural revitalization and landscape transformation. The plan includes architectural restoration, ecological landscape design, and the presentation of cultural activities, with an emphasis on sustainability and local traditions. The revitalized park is poised to become a vibrant center for cultural heritage, ecological leisure, and tourism, enhancing its cultural significance and attracting visitors.

KEYWORDS

Beihai garden expo park, cultural revival, landscape space reconstruction, architectural restoration, ecological renovation

1. INTRODUCTION

In the context of rapid urbanization, city parks, as important public spaces, not only serve ecological protection and recreational functions but also bear the mission of cultural transmission and innovation. As urbanization progresses, many parks and gardens, after initial construction and prosperity, face issues including as facility aging, functional decline, and management deficiencies, which necessitate their renovation and revitalization. Beihai Garden Expo Park, as an important cultural and ecological landmark in Beihai City, presents an opportunity for renovation not only to update the park's facilities and landscapes but also to deeply recreate the city's culture and history.

Since taking over the Garden Expo Park, a series of challenges, including aging buildings and damaged facilities, have directly impacted the park's functionality and visitor experience. Additionally, there are significant issues with the park's management in terms of protecting traditional architecture and operational management, which has led to the gradual decline of the park.

In recent years, national and local governments have introduced laws including as the "Interim Measures for National Park Management" [1] to promote the high-quality development of park affairs, improve urban ecology and living environments, and call for the integration of ecological, cultural, and social resources to facilitate the sustainable development of parks [2]. At the same time, local governments have increased investment in park renovation projects, improved urban garden and greening management, and launched guidelines including the "Urban Green Space System Planning and Construction Guide" [3]. These guidelines strengthen the design and construction management of major greening

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projects, ensure scientific demonstration and implementation, and guarantee project quality, striving to build a livable environment where humans and nature coexist harmoniously.

The renovation of the Beihai Garden Expo Park was carried out in this broader context. Although cultural and ecological values are important aspects of the park construction, they still lack necessary academic research and support. Therefore, the local government decided to entrust the renovation project to the local university, the only institution with sufficient academic resources, to promote the operation and renovation of the park. In this context, the depth and breadth of park renovation need to be improved, combining ecological and cultural restoration, as well as academic and professional knowledge.

Through this study, the overall value of the park is aimed to be increased, visitors are aimed to be attracted, etc., it is also to explore how to balance ecological restoration, cultural communication, and functional innovation in the transformation process. Through this study, the aim is to explore how to balance ecological restoration, cultural transmission, and functional innovation in the renovation process, enhancing the overall value and appeal of the park. By incorporating Xiangyunsha and plant dyes - traditional cultural elements - through innovative dyeing techniques and display formats, exhibition spaces with cultural depth and appeal will be created. These spaces will allow the park to transmit traditional culture while also offering the unique charm of modern design. Additionally, the research will explore how to optimize the visitor experience by integrating both static and dynamic displays in the park's functional reconstruction, making it a multifunctional space combining cultural exhibitions, recreational activities, and ecological tourism.

By advancing the ecological restoration of the park, scientific re-vegetation of damaged mountains, water bodies, and abandoned lands, as well as innovating traditional cultural activities, the revitalization of the Garden Expo Park is achieved. At the same time, this study provides theoretical guidance and practical experience for the design and renovation of similar parks, contributing to the protection of cultural heritage and the sustainable development of ecology. This research will not only enhance the park's cultural value and ecological impact but also offer a path for promoting the sustainable development of urban public spaces, advancing urban cultural revival, and supporting green development.

2. PROJECT BACKGROUND

Beihai Garden Expo Park, located in Beihai City, Guangxi Province, is a comprehensive park integrating garden art, cultural exhibitions, ecological recreation, and tourism. As one of Beihai's landmark scenic spots, the park presents the history, culture, and natural features of Beihai through its unique design concept. The overall layout of the park adopts the one axis and three rings planning method, symbolizing

Beihai's three developmental stages from the Han Dynasty to the present: technological Beihai, cultural Beihai, and ecological Beihai. This layout presents a multi-layered and diversified spatial structure, integrating modern technology, traditional culture, and natural ecology, aiming to showcase the unique charm of Beihai as a coastal city.

The park contains eight thematic areas, with the "Beihai Garden" being one of the most prominent, playing a key role in cultural exhibition. The essence of traditional Chinese gardens is integrated into about 20 acres of North Sea gardens, at the same time, it also draws lessons from the layout of Jiangnan gardens and the local characteristics of Beihai. The landscape elements of the garden include four buildings, a 50-meter-long corridor, four traditional Chinese pavilions, and a tranquil artificial lake, creating an elegant, tranquil, and traditional atmosphere. The three main buildings are cleverly connected with the entrance, forming a traditional courtyard layout, reflecting the essence of classical Chinese gardens.

However, the park has been largely idle since its completion in 2014. The maintenance and management of the park did not keep pace, leading to some problems. Equipment and buildings age over time and the vegetation is overgrown due to a lack of pruning and management, affecting the functional experience of the visual senses and space. Moreover, the park failed to create effective synergies for other cultural sites in the North Sea and failed to fully exploit its cultural exhibition and tourism potential.

3. STATUS ANALYSIS BEFORE RENOVATION

3.1. Aging core buildings and functional degradation

The four principal structures within the Garden Expo Park are ingeniously designed to blend traditional Chinese courtyard aesthetics with modern architectural techniques. However, over the years, due to various reasons, the park has been abandoned, leading to severe aging of the buildings within the park, which not only affects the aesthetic appeal of the area but also endangers their structural safety. The facades of the buildings show clear signs of weathering, with some walls cracked and paint peeling, severely damaging their visual appeal and structural integrity. There are significant issues with the traffic layout in certain areas of the park; the number of visitors was underestimated at the time of design, leading to many areas being too cramped. This poses a certain risk of trampling for visitors during their tour, reducing the overall experience, and severely impacting the comfort and satisfaction levels of the visitors.

3.2. Damaged rest areas and insufficient functionality

Public rest spaces meet the dual needs of people's physiology and psychology, not only providing a space for people to rest in public spaces but also offering a place for people to communicate [4]. The pavilions, corridors, and other rest areas within the Garden Expo Park were originally designed to offer visitors comfortable places to rest and interact.

However, over time, due to lack of maintenance, many pavilions, and walkways in the park now show obvious signs of tilting and corrosion, which has seriously affected the visitor experience and their anticipation for the park.

3.3. Monotonous landscaping and ecological imbalance

The landscaping of the park was initially intended to incorporate traditional garden elements, rich in cultural symbolism. Unfortunately, due to insufficient scientific management of the vegetation and the absence of timely updates, some green spaces have become overgrown. As a result, these areas now appear disorderly, failing to achieve the intended aesthetic appeal and ecological benefits. The plant species are relatively uniform, which has led to a lack of seasonal changes and visual impact. In some areas, overly dense vegetation impedes light penetration and airflow, further disrupting the ecological balance. Over time, many of the landscape features have lost their functionality and beauty, necessitating adjustments and optimizations to restore the park's ecological vitality.

Although the park's landscape design carries rich cultural meaning, it appears relatively static and traditional, lacking strong visual appeal and interactivity. Some areas, while retaining typical Chinese garden elements, have not integrated more artistic or creative landscape features including sculptures, water features, and stone pathways. These areas fail to capture visitors' attention sufficiently. In certain static viewing zones, visitors can only admire the scenery without engaging with it, and no immersive cultural experiences are provided, making the interaction feel weak during the visit.

3.4. Water features: ecological and aesthetic problems

The artificial lake and water pools within the park, originally one of the park's main attractions, have experienced ecological degradation due to a lack of effective management. The water quality has deteriorated, and in some areas, the water has even dried up. The surrounding landscape design of these water features is simple and lacks cultural depth, failing to connect with the overall cultural theme of the park. The decrease in water levels and poor water quality not only detracts from the original landscape effect but also harms the surrounding ecological system. Additionally, the absence of a sufficient cultural landscape zone around the water features has prevented them from becoming a central highlight of the park, undermining their potential to enhance the park's cultural atmosphere and scenic value.

4. RENOVATION PRINCIPLES AND CONCEPTS

4.1. Balancing heritage and innovation

Cultural heritage preservation forms the foundation of the renovation. Every design and restoration effort will respect the

traditional garden features and cultural symbols of the park while introducing innovative elements [5]. During the restoration of buildings and landscapes, traditional cultural characteristics, particularly local crafts like Xiangyunsha and plant dyeing will be preserved and enhanced, as unique cultural exhibition methods. Through the modern transformation of these elements, a fusion of tradition and modernity will be achieved, creating a natural blend between the two. By incorporating cultural activities into the park, these traditional crafts will be vividly displayed, increasing their vitality and appeal, and driving the cultural revival of the park.

4.2. Ecological priority and promoting green sustainable development

Ecological function is the top priority in the renovation. This study will comprehensively improve the park's water bodies, vegetation, and ecological environment by adopting scientific garden landscape design and plant configuration methods, gradually restoring ecological balance, and aiming to increase biodiversity through these means. Garden water bodies play a role in regulating air humidity and temperature, and can also dissolve harmful gases in the air, purifying it. In terms of water management, measures including introduced aquatic plants and wetland ecological restoration will transform the park into a green space where humans and nature coexist harmoniously. The renovation of buildings and construction of facilities will utilize energy-saving and environmentally friendly materials and technologies, supporting the park's sustainable development while ensuring resource conservation.

4.3. Seamless integration of tradition and modernity

The integration of tradition and modernity will be reflected not only in aesthetic design but also in technological innovation and experience optimization [6]. In terms of architectural style, the essence of traditional garden elements will be preserved, while using modern construction technology to enhance the structural safety and comfort of the buildings. Technological innovation is not only an important means to improve the visitor experience but also opens new areas of development for the park. Currently, emerging technologies including holographic projections, intelligent navigation, and automated services have been widely applied in local theme parks, significantly enhancing the interactive experience of visitors and the operational efficiency of the park. In terms of optimizing the visitor experience, the research will introduce cultural activities and interactive experiences to deepen the connection between visitors and traditional culture, thereby enhancing their sense of identity and participation in the park, and thus optimizing the visitor experience.

4.4. Enhancing visitor engagement and interactive experience

Interactive design is a vital component of landscape art and design. By incorporating innovative interactive facilities within the park, including intelligent navigation systems,

handicraft studios, and cultural activity exhibition areas, visitors can engage in activities like Xiangyunsha dyeing and plant dyeing, experiencing the charm of Chinese traditional civilization firsthand. This significantly enhances visitor engagement and, through innovative technological means and design concepts, also elevates the quality and interactivity of public spaces. To boost visitor satisfaction, the park will regularly organize traditional Chinese cultural activities, including but not limited to traditional craft exhibitions and fashion shows, showcasing the fusion of Xiangyunsha and other traditional handicrafts with modern design.

4.5. Rational resource utilization and environmental protection

The construction and management of the Garden Expo Park should focus on the conservation and efficient use of resources as well as the protection of the ecological environment. During the renovation process, resource wastage and overdevelopment will be resolutely avoided. Particularly when selecting construction materials and landscape facilities, priority should be given to the reuse of waste resources. In addition, environmentally friendly materials, energy-saving technologies, and ecological restoration measures should be adopted to reduce environmental impact and achieve sustainable development of the park [7]. Old stone and wood materials will be used to repair and beautify the park's landscape elements, maintaining historical authenticity while minimizing the use of new resources. The design of the park's facilities will focus on long-term maintenance and sustainability, ensuring that improvements in aesthetics and functionality do not lead to increased operating costs or greater environmental impact.

4.6. Innovative design and expanding cultural display and artistic expression

The renovation of the Garden Expo Park adopts some innovative design concepts, breaking away from the outdated ways of landscape display. This design will utilize modern technologies, including special lighting, mist effects, and dynamic art installations, to make the park more artistic and attractive [8]. Designers will also create some creative art exhibition areas, combining modern artistic styles with traditional cultural elements, turning the park into a place for exploring cultural innovation. Through a variety of designs and activities, a more colorful and rich cultural experience is aimed to be brought to visitors, making the park not just a place for viewing scenery but also a vibrant and interactive cultural venue. In this way, the park becomes a perfect blend of modern art and traditional culture, turning into a vibrant cultural center.

5. DESIGN AND RENOVATION STRATEGIES

5.1. Architectural restoration and optimization

The buildings in Beihai Garden Expo Park have fallen into disrepair due to the long planning and construction period

of the park, resulting in aging, decay, and potential safety hazards. Therefore, the planning for reconstruction should follow the principles of “preservation, restoration, and enhancement,” maintaining the original style, and highlighting the park's characteristics through partial adjustments within the garden: restoring some deteriorated or vanished landscape features, further improving service functions; enhancing the landscape features, adding leisure and fitness functions to the park, and perfecting the park's infrastructure. Hence, the renovation project is an adjustment and transformation carried out without altering the park's overall planning and spatial layout. The fundamental goal of the upcoming renovation is to ensure the structural integrity and safety of the buildings while restoring their historical significance and cultural charm. The renovation will employ the most advanced architectural methods and materials to reinforce the dilapidated structures (Fig. 1), in compliance with current safety regulations without harming the classic Chinese architectural aesthetics.

The refurbishment of the architectural space will not only preserve the historical characteristics of traditional ancient buildings but also establish more functional spaces for the area, including resting areas, exhibition spaces, and interactive zones. The decoration both inside and outside the buildings will be enhanced by integrating local cultural elements, including Xiangyunsha fabric and natural plant-based dyes, to improve the visual impact of the architectural design.

5.2. Pavilion and corridor restoration

In addition to the restoration of the buildings, the pavilions, and corridors within the park, which serve as traditional places of rest, are in urgent need of renovation and enhancement to recapture their historical essence and to improve their practicality. The focus of the restoration of the pavilions is to restore their original cultural ambiance. Regular inspections of the park's facilities are conducted to ensure their integrity. Timely daily maintenance and repairs are carried out, with regular painting and maintenance of seats and handrails, prompt repairs of pathways and flower beds, to extend the lifespan of the facilities and reduce the maintenance costs of the park. The materials and decorations of the pavilions and corridors will be redesigned (Fig. 2), with additional carvings and decorative details that incorporate traditional Chinese cultural elements added to the roofs and railings to highlight the park's unique



Fig. 1. Architectural restoration and optimization (Source: Authors)



Fig. 2. Pavilion and corridor restoration (Source: Authors)

traditional cultural characteristics. At the same time, the existing corridors and resting areas will also be upgraded, with a focus on improving comfort and landscape quality.

5.3. Ecological landscape renovation

The aim is to enhance the park's ecological value and visual appeal through meticulous planning of plant life and the improvement of water systems. Starting with vegetation, the study selected species suitable for the climate and soil of Guangxi, including camphor, osmanthus, camellia, and bougainvillea, using a combination of artificial planting and natural succession to reflect the changes of the four seasons (Fig. 3). To create an ecosystem that is low-cost to maintain, has rainwater regulation and water purification functions, the study chose to cultivate diverse vertical gardens by planting plants of varying heights, ranging from evergreen tropical species to low-growing shrubs, as well as various palm trees like cycads, coconuts, and king palms, thus achieving the fundamental goal [9]. The project utilized simple cut-and-fill techniques to create micro-topographies that act as sponges to collect acidic rainwater, neutralize alkaline soil, restore the park's brownfields, and introduce aquatic plants including reeds, lotus, and water celery, which will also provide habitats for aquatic creatures, thereby enhancing the ecological role of the water system and ultimately forming a self-replicating ecosystem. At the same time, it aims to create a beautiful urban park, letting nature

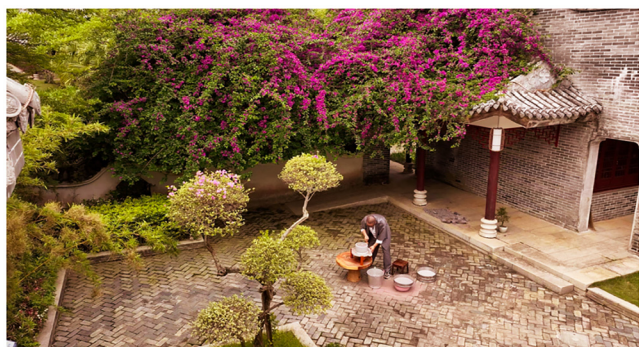


Fig. 3. Ecological landscape renovation (Source: Authors)

take its course and turning the process of ecological restoration into a process of providing ecosystem services.

The goal of optimizing green vegetation and landscaping is to offer visitors a tranquil and enjoyable natural experience. By integrating elements including lawns, flower beds, streams, and water features, the park's visual depth and appeal are enhanced, promoting a harmonious coexistence between humans and nature.

5.4. Pond ecological renovation

The pond, a pivotal landscape feature within the park, is set to undergo an ecological transformation with a focus on upgrading water quality, bolstering ecological roles, and distinguishing it as a unique park attraction. The renovation blueprint includes the introduction of aquatic flora, including lotus and reeds, to not only refine the water's purity but also to augment the pond's visual charm. This variety of water plants will serve a dual purpose: they will purify the water effectively and provide a sanctuary for waterfowl and other wildlife, thereby enriching the pond's ecosystem and promoting biodiversity within the park. Customized habitats for fish and birds will be established around the pond's perimeter, crafting a natural, dynamic ecological space that draws in visitors and encourages a connection with the natural world, thereby amplifying the pond's ecological significance.

Furthermore, to elevate the pond's visual allure and atmosphere, the renovation will integrate mist effect designs. Utilizing misting systems will add humidity and a sense of depth to the water area, conjuring a mystical and gentle ambiance. The mist not only enhances the landscape's aesthetic value but also offers an immersive encounter for visitors, transforming the pond into a lively, ecologically rich, and artistically charged landmark in the park (Fig. 4). With these innovative design elements, the pond will emerge as a central attraction, enticing visitors to stay and revel in nature's splendor.

5.5. Traditional cultural activities display

To deepen the cultural essence of the park and attract a broader audience, the park will implement a series of



Fig. 4. Pond ecological renovation (Source: Authors)

cultural exhibition activities, continuously advancing the expansion of park functions in areas including “+ classical music, + fashion show art, + traditional culture.” This not only complements the green space of the park but also serves as a heartfelt interpretation of the depth of Chinese traditional culture. Specialized areas for traditional culture will be established within the Garden Expo Park, where regular fashion shows, handicraft exhibitions, classical music performances, and fashion runway shows will be held, showcasing the fusion of classic Chinese culture with modern art [10].

To enhance the visual impact of the exhibitions, the park will lay reflective materials including aluminum foil on the ground to create unique light and shadow effects (Fig. 5). The fashion shows will display modern attire influenced by ancient crafts like Xiangyun fabric and natural dyes, emphasizing the synergy between traditional craftsmanship and current fashion trends, and revealing the unique charm of China’s cultural heritage. This design approach not only intensifies the visual appeal of the exhibits but also allows visitors to engage with the modern reinterpretation and ongoing relevance of traditional culture, providing a more enriching visual experience.

Building on the cultural exhibitions, the Garden Expo Park plans to introduce interactive experiences through the establishment of craft studios. Through these interactive experiences, visitors will have the chance to create their own Xiangyun fabric, participate in plant-based dyeing, and produce other traditional handicrafts, thus adding a layer of enjoyment and participation to the cultural showcases (Fig. 6). Following the concept of “traditional memory,” the aim is to transform “personal memories” into “public memories” through handicrafts, exploring the aspects of tradition, humanity, and craftsmanship. These interactive sessions not only allow visitors to appreciate the beauty of traditional cultural exhibits but also immerse them in the charm of ancient craftsmanship, deepening their understanding and admiration for China’s cultural heritage.



Fig. 5. Traditional cultural activities display (Source: Authors)



Fig. 6. Visitors participate in interactive experience of traditional culture (Source: Authors)

6. CONCLUSION

This paper systematically analyzes and studies the renovation of Beihai Garden Expo Park, proposing a renovation plan that encompasses building restoration, landscape ecological optimization, and cultural activity planning. Through architectural restoration and functional optimization, the park’s historic buildings have been preserved and enhanced; through landscape renovation and ecological optimization, the park’s ecological value and visual appeal have been strengthened; and through innovative cultural activities and display formats, visitors’ cultural experiences and sense of identification have been enriched. The overall renovation has not only facilitated the cultural revival of the park but also enhanced its multi-functionality and attractiveness.

However, challenges remain during the renovation process, including balanced cultural heritage preservation with tourism development and meeting the diverse needs of visitors. Further exploration and solutions are needed in the future to address these issues effectively.

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