

Research on Renovation Strategies for Post-Industrial Landscape Parks

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Abstract:

With the advent of the post-industrial era, a vast number of industrial heritage sites face abandonment and decay. Transforming industrial sites into post-industrial landscape parks through landscape design has become a key issue for sustainable urban design, as it enables the conservation, regeneration, and revitalization of these areas. This paper employs a combination of methods, including a literature review and case studies, to identify strategies that not only meet the needs of urban regeneration but also safeguard the cultural heritage of the city's industrial legacy. These strategies can provide valuable insights for the development of similar post-industrial landscape parks in China, helping to preserve the city's cultural heritage and holding significant economic, social, ecological, and cultural importance.

Keywords:

Post-industrial landscapes, Regeneration of Post-industrial Landscape Parks, Park Design

1. Introduction

Stages: the pre-industrial society, the industrial society and the post-industrial society. The post-industrial society is the product of the further development of the industrial society; following the 1980s, with the widespread application of global electronic information technology, human history entered the post-industrial society. With the transformation and development of industry, some production sites and service facilities from the industrial era have gradually been abandoned, giving rise to the phenomenon of 'de-industrialisation', whereby many industrial sites enclosed within city centres have become industrial wastelands [1]. Consequently, the regeneration and conservation of these industrial wastelands have attracted considerable attention, bringing post-industrial landscapes into the public eye [2]. Post-industrial landscape parks represent one such form of regeneration; they are urban public spaces created through landscape design and functional planning that integrate a variety of functions, including leisure, entertainment, science and education, and sports. Article 7 of the Notice on the 'Administrative Measures for National Industrial Heritage', issued by the Ministry of Industry and Information Technology on 14 March 2023, states that cities along the Grand Canal, the Yellow River and the Yangtze River, as well as former revolutionary base areas and old industrial cities, are encouraged and supported to participate systematically in the protection and utilisation of national industrial heritage through the construction of

national cultural parks, industrial heritage parks and patriotic education bases, alongside the relocation and redevelopment of old industrial cities. It also proposes that financial support will be provided for such projects [3].

The renovation and design of post-industrial landscape parks is not, in essence, a simple reconstruction, but rather manifests primarily as a profound respect for threefold values: firstly, respect for the traces of industrial history and collective memory; secondly, respect for the site's natural ecological processes and potential for restoration; and thirdly, respect for the humanistic ideas and social spirit embodied therein. This paper will conduct an in-depth study of the planning and design strategies, as well as the spatial creation logic, of existing post-industrial landscape parks, which may provide valuable insights for the construction of similar post-industrial landscape parks in China.

2. Current Situation and Challenges of Post-Industrial Landscape Parks

2.1. *Post-industrial landscapes and post-industrial landscape parks*

The post-industrial society is a historical stage of human society as defined by bourgeois scholars. Since the 1960s, developed Western nations have gradually transitioned into a post-industrial society[4]. The book *The Post-Industrial Society* proposes that the post-industrial society—also known as the knowledge society—is the product of the further development of industrial society. Its characteristics include the service-oriented economy, the rise of the technical class, the dominance of theoretical knowledge, technological planning and control, and the application of intelligent technologies.

In the course of urban development, a large number of production sites, equipment and buildings from the industrial era have been abandoned or left idle[5]. Industrial heritage refers to the remnants of buildings, facilities, machinery and other items formerly used for industrial production[6], including industrial buildings, disused factory premises and landfill sites[7]. The post-industrial landscape, meanwhile, is the result of the 'fusion' of industrial heritage and the landscape, presenting an opportunity for urban regeneration and innovation[8]. Furthermore, as former industrial areas have undergone decades or even centuries of development, with several generations having lived and worked there, unique memories and emotional attachments to these spaces are inevitable. Consequently, the post-industrial landscape also embodies the collective memory of one or several generations, representing vivid memories that remain close to people's lived experiences[9]. Consequently, the post-industrial landscape possesses multiple dimensions, interweaving material and cultural aspects, a sense of history and industrial character, as well as natural and man-made environments[6]. Against the backdrop of urban regeneration, the regeneration and conservation of industrial heritage sites constitute a significant component of urban regeneration research and have attracted widespread scholarly attention[10]. The concept of the post-industrial landscape itself corresponds to that of the post-industrial society; consequently, 'industry' broadly refers to the industrial system represented by large-scale industry, and the very objects of design that can be termed 'post-industrial landscapes' inherently carry the objectives of restoration and adaptive reuse, ranging from ecological to cultural dimensions[11]. The creation of post-industrial landscape parks represents one approach to the regeneration of derelict

industrial sites, and serves as a vehicle for continuing cultural heritage and preserving memories.

2.2. Current Research On Post-Industrial Landscape Parks

Domestic scholars are conducting increasingly in-depth research into post-industrial landscapes, and many post-industrial landscape parks have been established. Yufan Zhu notes that post-industrial landscapes can reflect a site's history. The history of abandonment of post-industrial sites represents the 'youngest' chapter of that history; it is precisely because of this 'youth' that the vessels of memory—from physical media to people—have largely not been entirely lost. Consequently, post-industrial landscapes constitute one of the most representative and comprehensive design types for exploring the relationship between history and design[11]. Post-industrial landscape parks serve as a means of commemorating a site's historical and cultural heritage; they are one of the key vehicles for preserving a city's industrial and historical memory, helping people to delve deeper into the site's history and rekindle their memories of the original location. Scholars Yan Nanming and Chen Fei argue that the significance of research into post-industrial landscapes lies not only in conservation and transmission, but also in regeneration and reuse[2]. The Hangzhou Steel Park on the Grand Canal is a prime example of this. In her article, Chen Jiawen mentions that during the construction of Hanggang Park, the design team preserved the original environment to the greatest extent possible, respecting the site's original form whilst incorporating and reinterpreting local memories to align with modern lifestyles. The park's landscape theme is 'a balance of strength and softness', skilfully interweaving historical ruins with the natural environment to create a vibrant artistic and cultural link[12]. All industrial heritage sites serve as repositories of historical memory; designers should explore and preserve their post-industrial elements of humanistic, historical and cultural value. At the same time, the natural ecosystem plays a significant role in the design of post-industrial landscape parks. Jiang Haiyan and Wang Yangyang argue that the design of post-industrial landscapes has been influenced by ecological thought throughout different periods, providing theoretical guidance and practical insights for the regeneration of industrial heritage sites against the backdrop of China's transition towards an ecological civilisation and high-quality development[13]. For example, Zhongshan Qijiang Park is a relatively successful example of early industrial heritage regeneration in China. Its designer, Yu Kongjian, mentions in his article that Zhongshan Qijiang Park incorporated modern Western landscape design techniques such as urban renewal and ecological restoration; this design style, distinct from conventional Chinese and Western gardens, has drawn the attention of the Chinese public to the regeneration and renewal of industrial heritage[14].

Research abroad has been more in-depth than that in China. In 1857, the American landscape architect Olmsted, drawing on the concept of urban parks, transformed derelict urban land into New York's Central Park, setting a precedent for addressing the environmental and social issues arising from the Industrial Revolution through landscape design; this provided a wealth of experience for the subsequent regeneration and conservation of urban industrial heritage sites[15]. The North Duisburg Landscape Park, situated in Germany's Ruhr industrial region, stands as a global exemplar of post-industrial landscapes. With industrial heritage sites forming the core of the park, designer Peter Latz opted for the comprehensive conservation of the overall layout of these sites, along with their spatial nodes and constituent

elements, rather than merely retaining selected parts[16]. Through aesthetic reflection, Latz explored the landscape of the industrial heritage sites within the North Duisburg Landscape Park. Contrary to the view held by traditional aestheticians, who regard industrial heritage sites as the result of human destruction of natural landscapes, he proposed the concept of 'New Nature'. He argued that, over time, abandoned industrial sites would develop unique vegetation communities, undergoing a slow yet tenacious process of vegetation succession, and that these could be transformed into post-industrial landscape parks as a means of attracting visitors[17]. Scholar Feng Xiaoyang argues that a well-designed post-industrial landscape park not only embodies the cultural identity of a region but also serves as a driving force for local economic and social development, whilst enhancing the well-being of the population and injecting new vitality and creativity into modern urban development[18].

In summary, at the theoretical level, the development of post-industrial landscape parks is now widely regarded as a key approach to the conservation of industrial heritage and urban regeneration. Possessing both material and cultural attributes, and balancing a sense of history with ecological restoration objectives, this concept has gained widespread recognition. In practice, classic examples such as the North Duisburg Landscape Park in Germany, Zhongshan Qijiang Park and the Grand Canal Hanggang Park have provided diverse design models and practical references for subsequent post-industrial landscape park renovations.

2.3. The Challenges Facing Post-Industrial Landscape Parks

Beijing 798 Art District is a successful post-industrial landscape park. It is a successful example of the upgrading and transformation of industrial areas. The design of the 798 Art District meets the needs of multiple stakeholders and promotes regional economic transformation and development through long-term strategies such as creating employment opportunities, expanding income sources, and increasing land value. His success has been widely imitated, but this kind of imitation is more reproduced in the external form, and rarely takes into account the historical context of the site and its location, thus lacking a sense of belonging and identity. Beijing 798 Art District abides by the design principle of preserving the industrial architectural style and landscape of the original site during the renovation, so if it is directly imitated, it will lead to the fracture of the bridge between the park and the local culture. For local residents, this cannot evoke their inner memories; for foreign tourists, they cannot understand the local history and culture through visits.

2.3.1. Insufficient reflection of local characteristics

For the transformation design of the old industrial base, special attention should be paid to the transformation of collectivism values. In decades of working and living together, workers not only collaborate on production lines, but also build emotional bonds beyond geography in canteens, family buildings and children's schools. Therefore, for this type of industrial sites, designers need to transform the collectivism values generated by workers, which are transformed into local identity of the region, so as to promote the renewal, activation, transformation and upgrading of the old industrial areas. For example, after the old industrial area moved to the outer suburbs with the development of the times, how to transform the memory of several generations of workers into a sense of belonging to the industrial area through renewal and transformation.

2.3.2. A lack of collectivist values

Scholar Juncheng Dai argues that existing research on the revitalization of abandoned industrial zones focuses primarily on the analysis and exploration of planning and design, as well as the preservation and transmission of industrial cultural heritage, while neglecting research into the spiritual and cultural aspects of the directly affected worker communities[17]. Through long-term shared living and working experiences, workers in old industrial zones develop a culture of collectivism; this culture needs to be transformed into a sense of local identity for the area, thereby driving the revitalization, transformation, and upgrading of these old industrial zones.

2.3.3. Lack of continuity between the interior and exterior spaces

The existing post-industrial landscape parks often pay more attention to the site protection and renewal and beautification within the park, and often forget to interact with the surrounding environment, which will reduce the integrity and inclusiveness of urban renewal. Because from the perspective of spatial structure, there will be a certain degree of separation between the remaining industrial sites and the surrounding environment. Therefore, if this problem is not solved, there will be a lack of smooth flow of people and line of sight between the park and the city streets and communities, which will form a spatial experience of internal and external separation. Not only that, the post-industrial landscape park also needs to rely on the regional location and urban environment when designing, and stimulate the potential of ecology, culture, economy, society and education from its own resource characteristics. At the same time, these potentials can also promote the development of the surrounding areas with the improvement of landscape quality[19].

3. A Study of Renovation Approaches and Case Studies for Post-Industrial Landscape Parks

3.1. Localised Adaptation: Continuing the Local Cultural Tradition

Different from simple imitation, the transformation of post-industrial landscape parks requires in-depth exploration of the historical context and regional cultural characteristics of the site to achieve ‘local translation’. Post-industrial landscape transformation should extract core symbols from the industrial history and regional culture of the site and transform them into a perceptible landscape language. For example, Zhongshan Qijiang Park is renovated by the Guangdong Shipyard. The design retains many old objects on the old site of the shipyard and adds many innovative designs related to the theme. The details such as trestle, banyan island and red box art installation show the integration of industrial aesthetics and ecological design. This project not only protects the industrial elements of the shipyard, but also integrates the local ecological environment, plays a role in showing and carrying the entrepreneurial process, and achieves the design goal of achieving the best results at the lowest cost.

3.2. Transforming Collective Memory: Fostering a Sense of Place

The design of the post-industrial landscape park should transform this collectivist value into a local identity of the region. By providing residents with a space carrier for participation, the original factory workers and community residents can become the main body of cultural heritage. The transformation of Fenghuangli Park in Longyan, Fujian is a typical case. For example, the design team has added a leisure area in the

transformation, inviting residents to participate in the creation of a cultural wall, and an 80 square meter ‘light industrial memory cultural wall’ has become a favorite place for residents to stop. This way of allowing the original factory workers to participate in the design not only implements the context inheritance, but also transforms the industrial area into a place with memory and temperature. Hanggang Park is the slogan of the steel plant ‘rigid and soft’ to follow the design principles of the project, the natural vitality and the cold industrial sites together, with the ‘rigid and soft, soft and rigid’ to arouse the memory of the original factory workers.

3.3. Blending indoor and outdoor spaces: eliminating the sense of spatial fragmentation

How to solve the problem of separating the site from the surrounding area and the overall ecology, landscape and culture is a challenge for the design team. Liu Jiakun, the designer of Hanggang Park, adheres to the design concept of “cherishing the history of Hanggang, caring for the traces of the years, modestly setting off the remains, and gardening between mountains and rivers.” On the premise of retaining the unique industrial imprint of Hanggang, he integrates the regional cultural characteristics of Jiangnan, and introduces an original garden system for Hanggang Park. At the same time, the park also connects multiple functional zones through design elements such as 45,000 square meters of super-large lawns and air trails, so that the park and the surrounding half-mountain forest parks form ecological continuity. The transformation of Yangpu Riverside in Shanghai also reflects the idea of integration of internal and external space. The Yangshupu Power Plant Relics Park transforms the large chimney, coal transport trestle, conveyor belt and other facilities into a part of the public space. The dry ash storage ash tank is transformed into the ash warehouse art space. The industrial relics and ecological landscape facilities are juxtaposed and combined to form an open waterfront public space for leisure and entertainment. The above cases have effectively broken the physical and psychological barriers between the space inside and outside the park, and made the post-industrial landscape park truly integrate into the overall spatial structure of the city.

4. Strategies for the Regeneration of Post-Industrial Landscape Parks

4.1. Prioritising authentic preservation, with tiered and categorised management and conservation

The material remains of industrial sites are the core value carrier of post-industrial landscape. For example, in the process of transformation, Shandong ferroalloy 1971 Industrial Heritage Park follows the principle of “authenticity first,” and completely retains core production equipment such as ironmaking blast furnace, hot blast stove and chimney, without displacement or excessive repair. These devices are not only key nodes in the industrial process, but also constitute the most intuitive visual landmarks of the site. At the same time, the designer reduces the deliberate renovation and ‘old’ treatment of the site, allowing natural traces such as rust, mottle, and plant climbing to remain, so that the industrial relics show a real time thickness. In order to further ensure the safety and sustainable use of the site, the park can also set up a special protection agency, which is responsible for the registration, numbering, photographing and archiving of various industrial components, and arrange daily

patrols to find and eliminate structural hidden dangers in time. This combination of hierarchical management and daily maintenance effectively balances the relationship between the open display and protection of the site.

4.2. Prioritising ecological restoration whilst integrating industrial character

The ecological renewal of post-industrial landscape is an important part of urban ecological civilization construction. In the transformation of the park, the green design strategy is mainly reflected in three levels. First of all, improve the coverage of green space, combine low-impact development facilities such as permeable pavement and rainwater gardens, improve the rainwater management capacity of the site, and alleviate the heat island effect. Secondly, the recycling of existing buildings and industrial waste-for example, the use of old bricks, waste steel slag, sleepers and other materials for pavement, retaining walls and landscape sketches, not only reduces the consumption of building materials, but also continues the industrial texture of the site. Finally, for the contaminated soil and groundwater left over from the factory, the engineering technology combining physical, chemical and bioremediation is used to remove or fix pollutants such as heavy metals and oil pollution, and gradually restore the ecological function of the land. The above measures have transformed the park from a former heritage site into a green public space with both ecological services and cultural display functions.

4.3. Recreating Scenes and Spaces, Preserving Collective Memory

Industrial sites not only contain material remains, but also carry the collective memory and emotional ties of generations of workers. A good post-industrial landscape park needs to adopt a 'material-spirit' dual-line parallel strategy in the excavation of historical context. On the one hand, it preserves and activates the typical space of the workers' living area, such as dormitory, canteen and other architectural sites, reproduces the picture of the community living together in the factory area, and enables tourists to perceive the daily trajectory of the workers. On the other hand, combined with local traditional skills, dialects and festival customs, old craftsmen and old model workers are invited to participate in interactive narration, and oral history images, old object display cabinets and story walls are set up in the display center or specific nodes. This kind of interactive display makes the industrial heritage no longer just a cold machine display, but a living carrier of local culture and collective identity.

4.4. Integration into cultural and tourism settings, combining diverse business formats

The sustainable operation of post-industrial landscape parks requires reasonable commercial and tourism function implantation. The post-industrial landscape park can seek a balance between protection and development, and build a multi-level tourism resource system. First, create a post-industrial cultural consumption scene, use the original industrial buildings to transform into coffee shops, restaurants, cultural exhibition halls and other facilities, form a consumption space with both industrial atmosphere and modern service functions, and meet the leisure and social needs of tourists. Second, the landscape utilization of industrial facilities-for example, the blast furnace platform is transformed into a viewing platform, and the trails and art installations are set along the rails, so that the original productive space can be transformed into a tour experience node. Finally, actively connect with the regional tourism development strategy, incorporate the park into the provincial industrial

tourism route, and link with the surrounding historical and cultural attractions to promote the transformation of the project from a single urban park to a cultural and tourism integrated landmark. Through the above strategies, the park not only continues the industrial memory, but also obtains the economic foundation of continuous renewal.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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