

Renewal and Transformation Models for Historic Districts Based on Sustainable Development Goals

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Abstract: This study explores renewal and transformation models for historic districts aligned with Sustainable Development Goals (SDGs), aiming to balance the preservation of cultural heritage with social, economic, and environmental development. By examining the intrinsic link between SDGs and historic district renewal, the study establishes an evaluation framework for these districts. Through literature review and inductive analysis, it identifies core challenges such as resource waste, cultural discontinuity, and stakeholder conflicts. Multi-dimensional methodologies, including policy analysis, spatial planning optimization, and eco-technology integration, are employed to propose sustainable renewal strategies. A qualitative-quantitative approach is used to evaluate the feasibility of the proposed models. Findings highlight the importance of protecting cultural heritage, enhancing community inclusiveness, optimizing resource use, and promoting green economy for balanced development. This research provides a novel theoretical framework and actionable strategies, offering scientific guidance for achieving synergy between urban development and cultural conservation.

Keywords: Sustainable Development Goals; Historic Districts; Renewal; Cultural Heritage Conservation; Green Development

1. Introduction

1.1 Research Background and Significance

With rapid urbanization, the renewal and conservation of historic districts have become critical global challenges. In China, a country with profound cultural heritage, historic districts represent both cultural memory and urban identity. However, urbanization pressures, overdevelopment driven by

economic imperatives, and diverse resident demands have led to issues such as functional decline, cultural fragmentation, and ecological degradation.

The United Nations' 2030 Agenda for Sustainable Development outlines 17 SDGs, with Goal 11 emphasizing the creation of inclusive, safe, resilient, and sustainable cities. This is directly relevant to historic district renewal. A sustainable renewal model not only preserves cultural and ecological values but also fosters economic vitality and social harmony, enabling the coexistence of modern urban life with historical memory.

1.2 Literature Review

Internationally, countries like Italy and France have implemented strict legal frameworks to safeguard the authenticity of historic districts while promoting sustainability through community engagement and cultural tourism. For example, Venice integrates mixed-use functions to enhance both cultural preservation and economic growth. In the United States, policies such as tax incentives encourage private investment in historic district renewal. In China, although significant progress has been made in policies and practices, challenges remain. The Regulations on the Protection of Famous Historical and Cultural Cities, Towns, and Villages provide a legal foundation, but economic priorities often overshadow cultural preservation, leading to destructive development in some cases. Furthermore, insufficient community participation and stakeholder conflicts hinder sustainable renewal efforts. Compared to global practices, China still needs improvements in policy design, stakeholder coordination, and technology integration.

1.3 Research Questions and Objectives

This research aims to address how historic district renewal can align with SDGs to achieve cultural preservation, functional

improvement, and sustainable development. It also investigates how to balance stakeholder interests and establish a practical, scalable renewal model. the objectives include:

Identifying the intersections between SDGs and historic district renewal;
Analyzing current issues and their root causes;
Proposing a sustainable renewal model and targeted optimization strategies.

1.4 Research Methods and Framework

This study employs a combination of literature analysis, systematic induction, and theoretical model development. the research framework involves:

Reviewing global and domestic practices to extract key elements of sustainable historic district renewal;
Conducting problem analysis and case studies to identify gaps in existing models;
Developing a renewal model and validating its scientific and practical feasibility through theoretical analysis.

2. Theoretical basis

2.1 Connotation and Framework of Sustainable Development Goals

The Sustainable Development Goals (SDGS) are the core framework of the global development agenda proposed by the United Nations in 2015, covering three core dimensions: economic, social and environmental. These goals emphasize the efficient use of resources, the protection of ecosystem and the realization of social equity in the process of development, and provide theoretical guidance for urban development. In the area of historic district renewal, the connotation of Sustainable development Goals is reflected in the coordinated promotion of ecological protection, cultural inheritance and community development.

2.2 Theoretical Review of Historic District Protection and Renewal

The research on the preservation and renewal of historic blocks mainly focuses on several areas: first, the protection theory from the perspective of cultural heritage, emphasizing the "authenticity" and "integrity" of historic blocks; the second is the renewal theory from the perspective of functional compound, advocating the enhancement of neighborhood

vitality through functional diversity; the third is the green renewal theory from the perspective of eco-city, which emphasizes sustainable development through green technology and low-carbon strategy. the above theories provide a multi-dimensional theoretical basis for the renewal of historical blocks, but how to integrate and apply them in concrete practice is still a difficulty in research.

2.3 Key Elements of Historic District Renewal from the Perspective of Sustainable Development

Combining the theory of sustainable development goals and the preservation and renewal of historic districts, this study extracts the following key elements: First, the balance between the authenticity of cultural heritage and modern functional needs; Second, the coordination of resource utilization efficiency and ecological protection in the process of renewal; Third, the construction of residents' interests and community participation mechanism; Fourth, the promotion of economic vitality and the realization of social equity.

3. Current Situation and Problems of Historic District Renewal and Reconstruction

3.1 Analysis of Current Historic District Update Mode

The existing renewal modes of historic blocks mainly include three categories: conservation-oriented, development-oriented and comprehensive balanced. the conservation-oriented model focuses on the protection of cultural heritage, but may be inadequate in terms of economic benefits and residents' needs. the development-oriented model aims to maximize economic value and tends to neglect cultural and ecological values. the comprehensive balanced model tries to find a balance between protection and development, but it faces difficulties due to the conflict of interests of many parties in the concrete implementation.

3.2 Common Problems Existing in Historic District Renewal

Through literature analysis and case review, it is found that there are the following common problems in the current renewal of historical

blocks: First, the protection of cultural heritage is insufficient, and many historical blocks have broken cultural memory in the process of renewal; Second, the application of green technology lags behind, and the problems of resource waste and ecological damage are more prominent; the third is the lack of protection of residents' interests, and the situation that residents' interests are damaged in the process of renewal frequently occurs; Fourth, the lack of public participation in planning decisions leads to the weakening of community identity and belonging.

3.3 Needs and Conflicts of Different Stakeholders

The renewal of historical blocks involves many subjects such as the government, developers, residents and cultural protection organizations, and the differences in interest demands of all parties lead to frequent conflicts. For example, governments usually attach importance to urban image and economic benefits, developers seek to maximize profits, residents are concerned about the living environment and economic compensation, and cultural preservation organizations emphasize the continuation of heritage values. the conflict of these interest demands directly affects the selection and implementation of the renewal model.

4. Construction of Renewal Model based on Sustainable Development Goals

4.1 Update the Framework Design of Transformation Mode Construction

The construction of the historic district renewal model based on the Sustainable Development Goals needs a systematic framework, which can realize the coordinated development of culture, ecology, society and economy from multiple dimensions. Framework design can be divided into the following main modules: target layer, strategy layer and implementation layer. the goal layer is guided by the Sustainable Development Goals (SDGs) proposed by the United Nations, which specifically covers four core goals: cultural heritage protection, ecological environment optimization, equitable community participation and economic vitality promotion. the strategy layer is the middle hub of the model, which transforms the target into

operational measures through a series of specific strategies, involving the application of ecological technology, functional complex design, social collaborative participation mechanism, etc. the implementation layer implements the strategy into actual projects, including the restoration of historical buildings, the construction of green infrastructure, and the introduction of diversified industries.

The advantage of this framework is that it fully considers the versatility and multi-stakeholder needs of historic districts. By coordinating the conflict and coupling relationship between different goals, the one-sidedness problem caused by single goal orientation in traditional renewal mode can be avoided. For example, the combination of cultural heritage protection and functional redevelopment, the balance between ecological protection and sustainable economic development, and the coordination of residents' interests and government objectives are the core considerations of the framework design.

4.2 Ecological Environment Protection and Resource Optimization Strategies

The ecological environment and resource utilization of historical districts are often impacted by the urbanization process. In the traditional renewal mode, due to the lack of the introduction of green technology, the phenomenon of resource waste is relatively common, and it is difficult to cope with the environmental challenges brought by climate change. In this context, it is necessary to put forward the strategies of ecological environment protection and resource optimization from the following aspects.

The first is the construction of green infrastructure in historic districts, including rain gardens, permeable paving, vertical greening and so on. Taking a historical district in Zhejiang Province as an example, the introduction of low impact development (LID) technology has reduced the stormwater runoff of the district by 40%, while improving the microclimate environment of the district. the second is the energy optimization strategy, through distributed energy systems and renewable energy technology, to achieve self-sufficiency and efficient use of energy in the historic district. In some cases, the integrated design of solar photovoltaics and buildings has been successfully applied to provide clean

energy support for neighborhoods.

In terms of optimal utilization of resources, based on the concept of circular economy, waste building materials in the process of block renewal can be reused. For example, in the renovation project of a historic district in Beijing, the utilization rate of waste building materials reached 75% through the application of recycled concrete technology, which not only reduced the discharge of construction waste, but also saved the material cost. In addition, attention should be paid to the restoration and protection of biodiversity in the district. For example, through the design of ecological corridors, the green space resources of the historic district should relate to the surrounding areas to provide habitats for animals and plants.

4.3 Protection and Inheritance Mechanism of Cultural Heritage

The preservation of cultural heritage is one of the core objectives of historic district renewal. Cultural heritage carries the historical memory and identity of the city, and is a precious non-renewable resource. However, in the actual renewal, the protection of cultural heritage often faces problems such as loss of authenticity and rupture of cultural inheritance. In view of the above problems, the design of cultural heritage protection and inheritance mechanism should first pay attention to the "authenticity" and "integrity" of protection. It is necessary to record the original state of historical buildings through detailed mapping of cultural relics, digital documentation and other technical means. In the conservation project of Southern Song Imperial Street in Hangzhou, BIM (Building information modeling) technology is used to digitally model historical buildings, which provides a scientific basis for protection and renewal, and facilitates subsequent maintenance and restoration.

In the aspect of cultural inheritance, the cultural resources of historical districts can be transformed into community education and tourism resources by means of activation and utilization. For example, by setting up intangible heritage workshops and cultural exhibition centers, we can not only inherit traditional crafts, but also enhance the community's sense of identity and participation in history and culture. In addition, in

international cultural exchanges, historic districts can serve as carriers of cultural transmission, undertake diverse cultural activities, and enhance the city's global influence.

4.4 Social Inclusion and Community Participation Models

Social inclusion and community participation are the social basis for the sustainable renewal of historic districts. In the traditional renewal model, due to the lack of community participation, residents lack a sense of identity for the renewal project, and even the phenomenon of interest damage. To solve this problem, we need to build a community participation model based on social inclusion.

Community meetings are an important form of community participation, through the participation of residents' representatives, government agencies, developers and cultural preservation groups to ensure the transparency and fairness of renewal projects. Taking Yongqing Fang in Guangzhou as an example, through the mechanism of community meeting, residents not only put forward opinions during the renovation, but also directly participated in the design and management of some public Spaces, which greatly improved community cohesion.

In addition, in terms of social inclusion, special attention should be paid to the protection of the interests of vulnerable groups. For example, in tenant resettlement, the introduction of rent subsidy policies and community housing can effectively avoid the phenomenon of "cultural expulsion" caused by renewal.

4.5 Innovative Path for Sustainable Economic Development

The sustainable economic development of historic districts needs to explore innovation paths in three aspects: industrial structure optimization, cultural tourism integration and innovation and entrepreneurship incubation.

Reasonable adjustment of industrial structure is an important basis for sustainable development of historic district economy. By introducing cultural and creative industries and innovative service industries, historic districts can be transformed from traditional business models into high value-added industrial clusters. For example, Pingjiang Road in Suzhou City, based on special handicrafts and

cultural and creative products, has attracted many young entrepreneurs to settle in, forming a cultural and creative industry chain.

Cultural and tourism integration is another key path. Through the development of cultural tourism resources in historical districts, the source of economic income can be expanded. For example, Datang City in Xi 'an has attracted many tourists through light shows, cultural performances and other activities, which has directly driven the economic recovery of the block.

At the same time, historic districts can also take advantage of their unique environmental advantages to develop incubation platforms for innovation and entrepreneurship. Encouraging young people to combine traditional culture with modern technology to create cultural products with market value not only contributes to the sustainable development of the neighborhood economy, but also promotes the inheritance and innovation of culture.

5. Evaluation and Optimization of Renovation Mode

5.1 Evaluation Index System of Historic District Renewal

Constructing a scientific evaluation index system is the basis to measure the effectiveness of the model of renewal and transformation. the evaluation index can be developed from the following aspects: cultural dimension, environmental dimension, social dimension and economic dimension. For example, in the cultural dimension, the preservation rate of historical buildings and the inheritance rate of intangible cultural heritage projects are important indicators; In the environmental dimension, resource utilization efficiency and carbon emission intensity are the key factors. In the social dimension, residents' participation rate and community satisfaction are important parameters. In the economic dimension, the growth rate of industrial income and employment rate are the core indicators.

5.2 Feasibility Analysis of Pattern Application

By combining theoretical model and practical case, feasibility analysis should start from three aspects: technical feasibility, economic profitability and social acceptability. For example, for the application of ecological

technology, the method of pilot testing can be adopted to gradually promote to reduce technical risks; In terms of economic profitability, through the introduction of PPP (public-private capital cooperation) model, investment risks can be shared; In terms of social acceptance, through early community participation, residents' recognition and support for the project are enhanced.

5.3 Suggestions on Upgrading Mode Optimization

The optimization proposals mainly focus on the following aspects: strengthening the multi-stakeholder coordination mechanism, promoting green technology innovation, improving the policy support system and enhancing the capacity of cultural communication. For example, in terms of policy support, enterprises and communities can be encouraged to participate in the green renewal of historic districts through tax incentives, special capital investment and other means.

6. Conclusion

This study proposed a model of historic district renewal based on sustainable development Goals, constructed a multi-dimensional renewal framework, and proposed specific strategies for ecological protection, cultural inheritance, social inclusion and economic innovation. the research shows that the renewal of historic districts needs to achieve a balance between multiple goals, and can effectively achieve a win-win situation between cultural value and urban development by integrating green technology, social coordination mechanism and innovative economic model.

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