Research Paper

Asset-based perspective on asset valuation system for old industrial communities in Northeast China

Taking the Harbin Turbine Factory Community as an Example

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Abstract

The old industries in Northeast China are now facing new development opportunities in the context of urban renewal, and the level of supporting communities is a key factor affecting industrial structure and economic development. "Asset-based" refers to the transformation of communities from relying on external resources to exploiting potential assets and forming a community development model with endogenous dynamics as the core. To address the situation that asset-based theory has been less studied and practiced in northern China, this paper takes the Harbin Turbine Factory community as an example, analyzes asset types, sorts out community assets, constructs an asset evaluation system, uses the hierarchical analysis method and fuzzy evaluation method to determine asset weights, clarifies community needs, explores a new model of community development, provides a basis for future community governance actions in Harbin, promotes inclusive community planning and development, and provides solutions for urban grassroots governance. provide solution ideas for urban grassroots governance.

Keywords

asset-based, old industrial community, asset database, value evaluation system, community renewal

1. Introduction

1.1.Research Background

Harbin, as the first northern city after 1949, has a good foundation for industrial development, and the landing of many important industrial projects during the First Five-Year Plan has prompted it to become a key industrial base city and a leader in the wave of industrialization. In the period of rapid industrial development in Harbin, to protect the normal life of workers, the construction of supporting residential areas in the vicinity of the plant, upheld the guidelines of production first and then life. However, the old industrial production resources were consumed excessively and the capacity structure could not keep pace with urban renewal and market development. The drawbacks of the unitary old industrial community gradually became apparent, and the community development gradually declined with the industrial relocation and the phenomenon of community hollowing out. China put forward the

development strategy of revitalizing the old industrial bases in northeast China in 2003, and subsequently promulgated a series of policy decrees illustrating the importance of the old industrial bases. The strategy proposes to focus on preserving industrial heritage with regional characteristics, historical buildings, and traditional neighborhoods, focus on protecting and improving people's livelihood, improve infrastructure to make up for the shortcomings of people's livelihood, and enhance the ability to protect people's livelihood, and urban renewal and community governance need to be explored in a new way.

The 20th National Congress of the Communist Party of China put forward a relatively complete content of community governance, including:

(1) improve the social governance system of common construction, governance, and sharing.

(2) insisting that the people's city be built by the people and the people's city be for the people.

(3) Comprehensive development of consultative democracy.

(4) active development of grassroots democracy.

(5) in the social grassroots adhere to and develop a new era of the "maple bridge experience".

(6) strengthen the Party building work in urban communities and promote Party building to lead grassroots governance.

1.2.Purpose and Significance of the Study

The industry is a powerful engine of urban development in Harbin, but the production process causes environmental pollution and unsustainable development. In recent years, under the influence of the national concept of promoting urban renewal and building people's cities, Harbin has implemented a shift from production-oriented and living-light to a livable and livable development model, and the transformation and upgrading of old industrial bases is imperative, and the transformation and renewal of old industrial communities is imminent. This paper applies asset-based theory to study the types and distribution of assets in old industrial communities, determine the impact of different assets on community development, build an asset evaluation system for old industrial communities, provide a reference for the application of the ABCD model in northern Chinese communities, and explore new models of community development.

1.3.Object and Scope of the Study

This paper takes the turbine plant community in Xiangfang District, Harbin City as the main research object, determines the asset types of old industrial communities and constructs a database of old industrial communities based on field visits and literature surveys, uses hierarchical analysis and fuzzy evaluation to determine asset weights and scores, analyzes community asset values, residents' transformation needs, and renewal potential, and constructs a community asset evaluation system.

2. Methodology

2.1.Research Methodology

This paper uses literature reading, quantitative analysis combined with qualitative analysis, and the research method of a five-level Likert scale, collects and composes literature such as books, journals, dissertations, and academic reports to grasp the relevant research progress of asset-based theory, analyzes community assets judgment through sample survey and data collection, and reflects residents' subjective judgment of community assets through a five-level scale.

2.2.Theoretical Framework

In 1993, Kretzman and Mc Knight proposed an "asset-based" model of community development in their book "The Inner Orientation of Community Building: A Pathway to Finding and Mobilizing Community Assets". They argued that demand-driven community development, characterized by dependence on external resources, is passive and unsustainable, while asset-based theory shifts the perspective to the community's resource advantages and pursues sustainable community development based on community assets and driven by community relationships, i.e., the ABCD model.

Hong Huang pioneered the concept of the ABCD model to examine the effectiveness of building using capital theory in Hong Kong. Professor Kuang Xiaoming of Tongji University pointed out that there are three major principles of asset-based community development, which are asset-based, intrinsically oriented, and relationship-driven. Professor Huang Tiling of Chongqing University proposed the concept of asset-based, tapping into the potential resources of the community, transforming them into real resources, assessing the economic value, assessing the resources, using the assets to achieve value appreciation to generate income, and realizing the conversion of asset capitalization, i.e. creating community capital.

Old industrial communities are communities that emerged and were established after 1949 and gradually formed as one production and living area. Such communities grew up under the industrial storm at the early stage of the founding of the country, and also experienced the change from planned economy to market economy, with industry as the core and close neighborhood relationship. As one of the old industrial bases in China, Harbin City has formed an industrial economic structure with state-owned large and medium-sized enterprises as the mainstay and heavy industry as the center of gravity. To facilitate the life of enterprise workers, matching living areas were built, and their structure is shown in Figure 1. Nowadays, the population of old industrial communities is aging seriously, the residents are less educated, their economic affordability is lower, and industrial culture is not preserved and inherited.

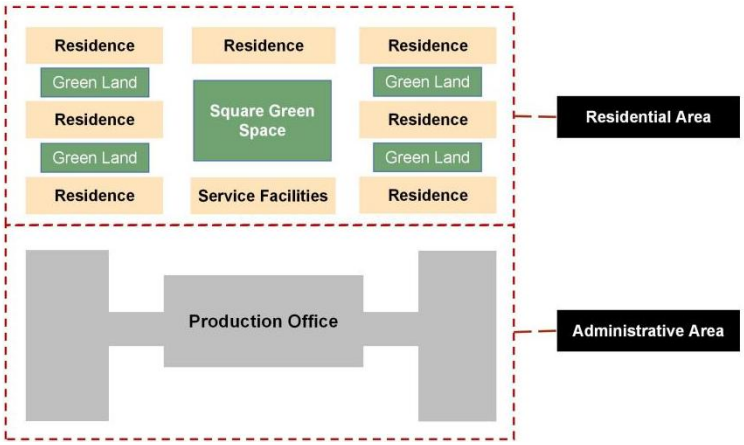

Figure1. Traditional Unit Compound Layout. Source:Author.

Community assets are the basis for driving community development, generating income and achieving value-added. According to the characteristics of old industrial communities, material assets guarantee community development, political assets lead community direction, cultural assets nurture community progress, and social assets promote community operation. Therefore, this paper divides the asset types of old industrial communities into these four categories and forms an asset database.

2.3.Data Collection and analysis methods

Data collection and analysis using field surveys, questionnaires, and interviews, for the current development of old industrial communities in Harbin, according to a certain basis to select representative old industrial communities, field surveys for the combing of basic conditions, to determine the current state of assets of old industrial communities, combined with the literature and the current situation, detailed questionnaire content, through questionnaires and interview surveys, to obtain community-based information to provide data for the thesis research.

3. Analysis of Turbine Plant Community Status and Asset Evaluation

The industrial zone is an important engine to drive the economic development of Harbin city, however, influenced by the construction policy at that time, community life services often lag behind the industrial development of the park and community conflicts are not solved to deal with the problem of poor environmental foundation, weak cultural atmosphere, low utilization of space.

3.1.Status Survey

3.1.1. General Information

(1) District traffic

The research object is the turbine plant community, the base is located in the three major power road areas of Harbin City Xiangfang Industrial Zone, close to the turbine plant, Haber and other industrial parks, close to the provincial forest zoo, Lesong business district and other important urban nodes, close to the city's second ring, close to subway line 3 and bus stops, with obvious traffic advantages, as shown in Figure 2.

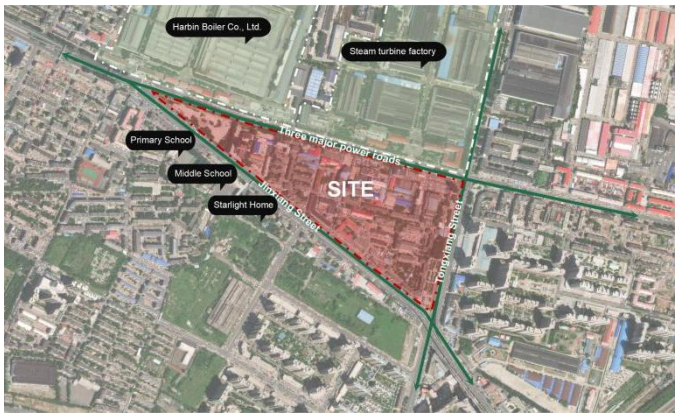

Figure2. Turbine Plant Community Location. Source:Author.

(2) History

In the 1950s, a number of enterprise unit compounds were arranged around the traditional downtown area of Harbin, and the turbine plant community was established at this time. After 1990, influenced by state-owned enterprise reform and other policies, the development of many old industrial enterprises in the northeast fell into difficulties, and the construction of enterprise unit compounds was affected by management systems, financial support, and human resources, and lagged behind urban development. By the beginning of the 21st century, the economic decline of large state-owned enterprises and the relocation of indigenous people in the compound of enterprise units who were in a position to do so led to serious population loss and tne aging of the community.

(3) Space form

The turbine plant community compound consists of three types of buildings in the shape of "one", "L" and "⊏", with green space or public space in the middle. The combination of buildings is square and neat, with strong orderliness, low volume ratio, the large spatial scale of the compound, and Soviet-style linear arrangement of street space, forming a distinctive and coherent public green belt in the center, as shown in Figure 3.

Figure3. Spatial form of turbine plant community buildings. Source:Author.

(4) Residential Quality

The residential buildings in the turbine plant community were built in the 1970s and 1980s, the construction age is long, property management and housing maintenance are not in place, the overall framework and structure of the buildings are well preserved, the quality of the environment outside the community is poor, the buildings have serious safety hazards, and the public space is occupied by debris, as shown in Figure 4.

Figure4. Spatial form of turbine plant community buildings. Source:Author.

(5) Infrastructure

The turbine plant community has built perfect public service facilities in the early days, including schools, hospitals, and public green spaces, but some of the public facilities are now deserted or abandoned. In terms of the green environment, the green space is encroached upon and garbage is piled up everywhere, which seriously affects the community environment; the firefighting equipment is old and the fire escapes are narrow; the public fitness facilities cannot be updated and maintained in time, the safety facilities are weak and the official website is aging, etc. There are problems such as the hardware facilities cannot keep up and the software services are not in place.

(6) Public Space

The turbine plant community lacks public space for residents' activities, and a large number of illegal constructions seriously encroach on public space. Currently, property rights in the community are complex, making it difficult to open up enough space for residents to use. There is a lack of necessary indoor activity space, and residents do not have enough space for long-time activities in winter. The parking space allocation for residents' own cars is small, and the phenomenon of indiscriminate parking of vehicles is serious, as shown in Figure 5.

Figure5. Turbine plant community public space occupation. Source:Author.

3.1.2. Community Composition

(1) Community organizations

The community committee of the turbine plant has a weak ability to coordinate and manage, there is no effective way to solve public affairs, it is difficult to obtain government subsidy support, the property function is not comprehensive, and it can only govern the basic problems of the community, and the overall quality of life of the residents is average.

(2) Resident population

Most of the people living in the community are elderly employees, their families, and later school district buyers and tenants, with a relatively even ratio of men to women. A survey of the age of the community's population found that the population living in the turbine plant community is dominated by middle-aged and elderly people over 60 years old, who are seriously aging and are mostly retired employees of the turbine plant, with good neighborly relations and strong dependence on community services, and have the potential to become the main builders of the community. The residents are not highly educated and their overall income is not high, mostly around 3,000 RMB, which can meet the basic living needs of the elderly retired workers. As the quality of the community space environment declines, residents in a position to do so move out of the community, leading to increased population mobility and a breakdown of the original social relationship network. Community residents learn about community information through community bulletin boards and neighborhood committee notices and gather mostly in small community squares or on the roadside, where there is a great demand for employment, environmental improvement, cultural activities, and property management enhancement.

(3) Participation method

Property management in the turbine plant community is difficult, and there is a situation that residents are late in paying property fees, which makes it difficult to implement community environmental improvement and property management, lack of management funds, gradual loss of the collectivization complex of unit-type communities, an increase of mobile population, thin interpersonal relationships, and lack of systematic community management.

3.2. Demand Survey

This study investigates and understands the needs of different groups of people through on-site visits, semi-structured interviews, and questionnaires.

3.2.1. Children's group needs

Children are a more dynamic group, curious about novel activities such as community-building environments, have a greater demand for education and activities, and have high requirements for the fun and safety of play space. The turbine plant community currently has a single space for children's activities and needs more flexible space types.

3.2.2. Needs of elderly groups

The elderly people in the community are mostly aborigines with a strong sense of community belonging and dependence, mainly static activities, and need to increase community accessibility design and optimize the security environment due to physical reasons. According to the survey, the turbine plant community lacks cultural and recreational facilities to meet the spiritual and cultural needs of community residents, and the community public space environment is poor, as shown in Figure 6.

Figure6. Behavioral activities for older persons. Source:Author.

3.2.3. Tenant Group Needs

The tenants work outside most of the day and are not familiar with the surrounding residents, and most of the tenants are young people, with dynamic types of activities and with certain jumps, low economic level, and poor sense of community belonging and honor. And there are no more jobs around the turbine plant community to meet the needs of the tenants, and the younger group has a stronger willingness to consume, hoping to increase the commercial facilities, living facilities, and leisure and entertainment facilities around the community.

3.2.4. Merchant Group Needs

Merchants around the community complain about the small number of parking spaces, the serious phenomenon of indiscriminate parking of vehicles, which seriously occupies the business space, the lack of unified management of convenient service outlets, the small scale and fragility of community businesses, the diverse needs of residents, the high operating costs of community businesses, which cannot meet the needs of all residents, and the need to increase the support and unified and coordinated management of community merchants.

3.3. Establishing community assessment system and analysis

3.3.1. Mapping Community Assets

(1) Material assets

Physical assets are material resources that can promote community development and are the physical spatial carriers of community values, including the built and natural environments, which are explicit assets and also require long-term maintenance, and physical asset indicators are shown in Figure 7.

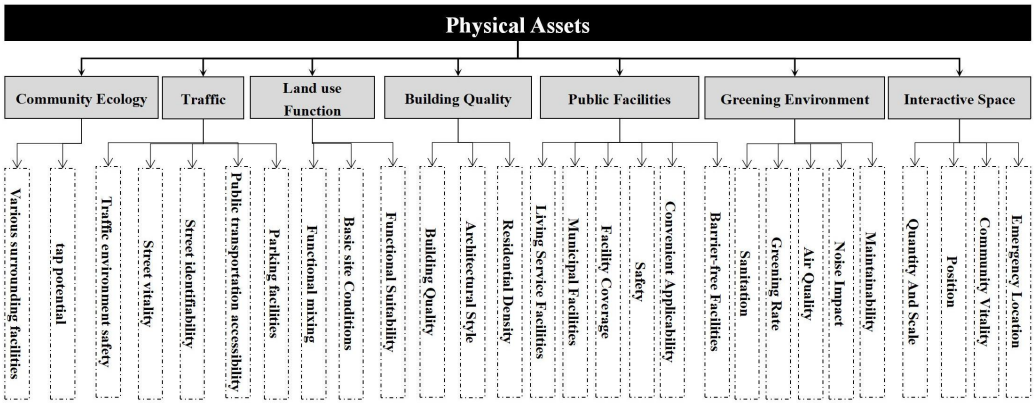

Figure7. Turbine plant community material asset indicators. Source:Author.

(2) Social assets

Social assets are community organizations, social relationships, and social networks that can promote community services and facilitate community development, etc. They are highly attractive to market forces, are hidden assets, are not restricted by space, and are important guarantees for community development. The indicators of social assets of the turbine plant are shown in Figure 8.

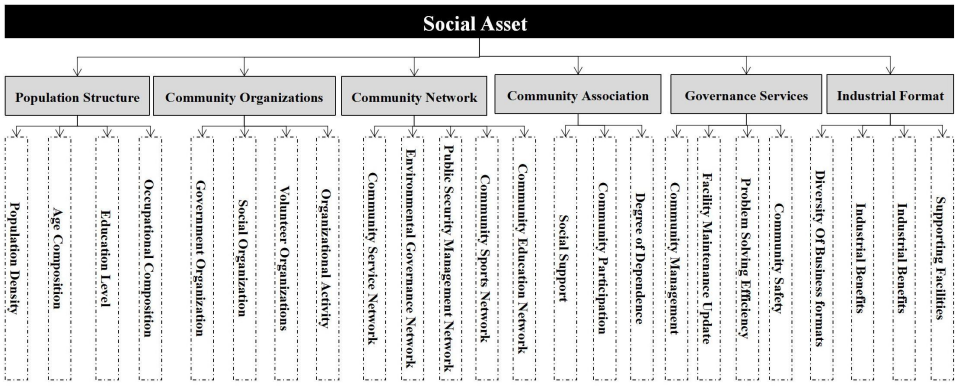

Figure8. Turbine Plant Community Social Asset Indicators. Source:Author.

(3) Cultural assets

Cultural assets refer to cultural activities that help promote spiritual civilization such as cultural relics and monuments or folk stories preserved during the formation of the community, including cultural barriers, cultural activities, and cultural spirit, which are important power sources and catalytic points for community renewal, and the cultural indicators of the turbine plant are shown in Figure 9.

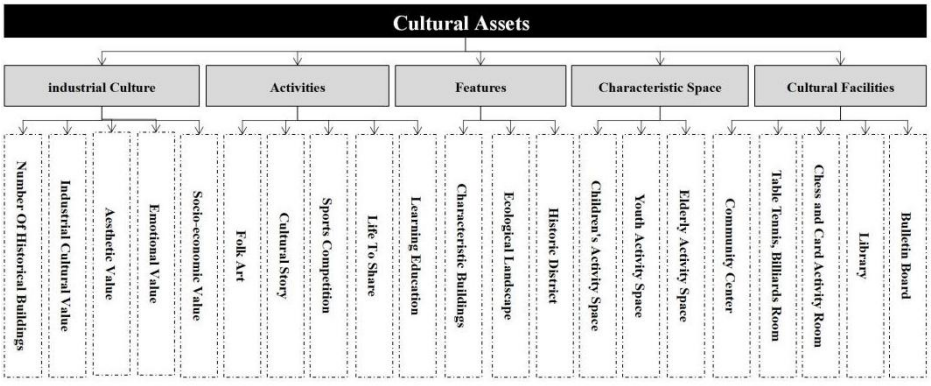

Figure9. Turbine Plant Community Cultural Asset Indicators. Source:Author.

(4) Political assets

Political assets are party platforms and organizations that promote community management, including grassroots government and neighborhood committees, which are the leading force in community development. The indicators of political assets of the turbine plant are shown in Figure 10.

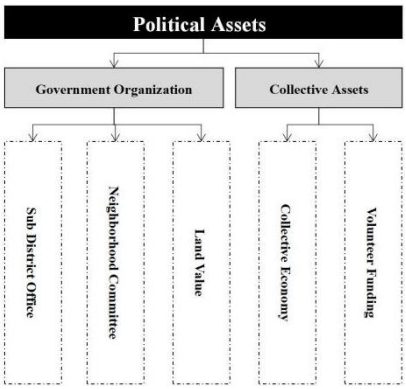

Figure10. Turbine Plant Community Political Asset Indicators. Source:Author.

3.3.2. Building a community evaluation system

The turbine plant community establishes the index system in four main segments, as shown in Figure 11. Firstly, it is to investigate the basic conditions of the community, identify the asset types, and establish the asset database. Secondly, the evaluation indexes are determined and the structural model is constructed, using the AHP hierarchical analysis method to construct the "target layer - quasi-measurement layer - index layer" structural model. Then, we determine the weight of each indicator, construct a comparison matrix, and compare each indicator with its associated indicator of the same level. Finally, the weights are calculated and ranked, and the results are shown in Table 1.

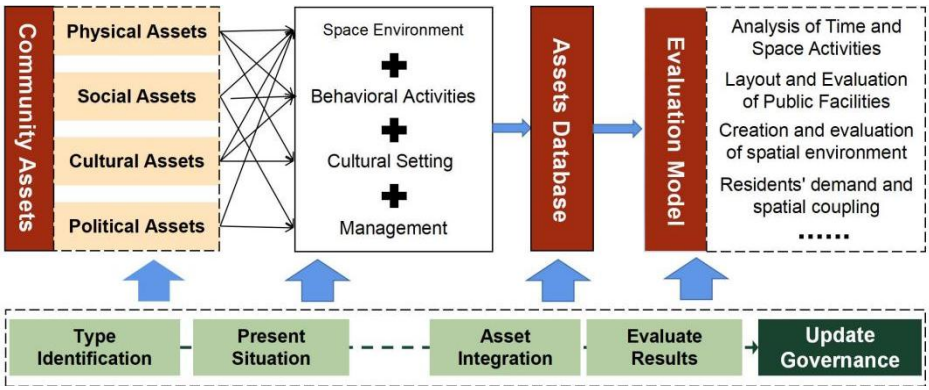

Figure11.Indicator Framework Structure Model. Source:Author.

Table1. Turbine Plant Community Asset Indicator Weights

Category	Dimensionality	Weights	Sub-dimensions	Weights
Physical assets	Community Location	0.2721	Various surrounding facilities	0.0680
			Tap potential	0.2041
	Traffic	0.2704	Traffic environment safety	0.0713

Social Asset	Land use Function	0.0563	Street vitality	0.0510
			Street identifiability	0.0212
			Public transportation accessibility	0.0945
			Parking facilities	0.0425
			Functional mixing	0.0297
			Basic site Conditions	0.0079
			Functional Suitability	0.0187
	Building Quality	0.1415	Building Quality	0.0471
			Architectural Style	0.0198
			Residential Density	0.0747
	Public Facilities	0.1108	Living Service Facilities	0.0128
			Municipal Facilities	0.0074
			Facility Coverage	0.0177
			Safety	0.0176
			Convenient Applicability	0.0339
			Barrier-free Facilities	0.0214
	Greening Environment	0.0488	Sanitation	0.0083
			Greening Rate	0.0112
			Air Quality	0.0059
			Noise Impact	0.0065
	Interactive Space	0.1001	Maintainability	0.0168
			Quantity And Scale	0.0222
			Position	0.0174
			Community Vitality	0.0518
			Emergency Location	0.0087
	Population Structure	0.1232	Population Density	0.0625
			Age Composition	0.0264
			Education Level	0.0125
			Occupational Composition	0.0218
	Community Network	0.1559	Community Service Network	0.0188
			Environmental Governance Network	0.0318

			Public Security Management Network	0.0641
			Community Sports Network	0.0139
			Community Education Network	0.0272
	Community Association	0.1137	Social Support	0.0353
			Community Participation	0.0223
			Degree of Dependence	0.0561
			Community Management	0.0380
	Governance Services	0.2818	Facility Maintenance Update	0.0285
			Problem Solving Efficiency	0.0937
			Community Safety	0.1215
	Industrial Format	0.3254	Diversity Of Business formats	0.0965
			Industrial Benefits	0.0630
			Industrial Benefits	0.0870
			Supporting Facilities	0.0469
	Industrial Culture	0.1220	Number Of Historical Buildings	0.0079
			Industrial Cultural Value	0.0221
			Aesthetic Value	0.0128
			Emotional Value	0.0264
			Socio-economic Value	0.0530
Cultural Assets	Activities	0.2441	Folk Art	0.0742
			Cultural Story	0.0642
			Sports Competition	0.0515
			Life To Share	0.0273
			Learning Education	0.0270
	Features	0.1119	Characteristic Buildings	0.0219
			Ecological Landscape	0.0348
			Historic District	0.0552
	Characteristic Space	0.2136	Children's Activity Space	0.0915
			Youth Activity Space	0.0305

	Cultural Facilities	0.3084	Elderly Activity Space	0.0915
			Community Center	0.1021
			Table Tennis, Billiards Room	0.0376
			Chess and Card Activity Room	0.0701
			Library	0.0250
			Bulletin Board	0.0737

The fuzzy evaluation matrix was established by using the fuzzy comprehensive evaluation method, and the quantitative analysis of evaluation levels was carried out by issuing questionnaires and using the five-level Likert scale method, which was divided into five levels: good, better, moderate, poor and poor, and the results of the questionnaires are shown in Table 2.

Table2. Turbine Plant Community Asset Metrics Score

Influencing Factors		Distinction	Very Good	Good	Pass	Fail
Community Ecology	Various surrounding facilities	0	0	0	0.4	0.6
	Tap potential	0	0.2	0.4	0.2	0.2
Traffic	Traffic environment safety	0	0	0.4	0.4	0.2
	Street vitality	0	0.4	0.2	0.4	0
	Street identifiability	0	0.2	0.2	0.6	0
	Public transportation accessibility	0	0.2	0.2	0.4	0.2
	Function mixing	0	0.2	0	0.6	0.2
Land use Function	Basic site Conditions	0	0	0	0.6	0.4
	Functional suitability	0	0.2	0.2	0.4	0.2
Building Quality	Building Quality	0	0	0	0.8	0.2
	Architectural Style	0	0.2	0	0.4	0.4
	Residential Density	0	0.4	0	0	0.6
Public	Living Service	0	0	0	0.6	0.4

Facilities	Facilities					
	Municipal Facilities	0	0	0.2	0.6	0.2
	Facility Coverage	0	0.2	0	0.6	0.2
	Safety	0	0.2	0	0.8	0
	Convenient Applicability	0	0	0.4	0.4	0.2
	Barrier-free Facilities	0	0	0	0.6	0.4
	Sanitation	0	0	0	0.6	0.4
Greening Environment	Greening Rate	0	0.2	0.2	0.6	0
	Air Quality	0	0.2	0.2	0.6	0
	Noise Impact	0	0	0	0.2	0.8
	Maintainability	0	0	0	0.4	0.6
Interactive Space	Quantity And Scale	0	0.2	0	0.8	0
	Position	0	0.2	0	0.8	0
	Community Vitality	0	0.2	0.2	0.6	0
Community Network	Community Service Network	0	0.2	0.2	0.6	0
	Environmental Governance Network	0	0	0.2	0.6	0.2
	Public Security Management Network	0	0	0	0.6	0.4
	Community Sports Network	0	0	0	0.6	0.4
	Community Education Network	0	0	0	0.6	0.4
Community Association	Social Support	0	0.2	0.6	0.2	0
	Community Participation	0	0	0	0.6	0.4
	Degree of Dependence	0	0	0.2	0.6	0.2

	Community Management	0	0	0.2	0.6	0.2
Governance Services	Facility Maintenance Update	0	0	0.2	0.4	0.4
	Problem Solving Efficiency	0	0	0.2	0.6	0.2
	Community Safety	0	0	0	0.6	0.4
	Diversity Of Business formats	0	0	0.2	0.6	0.2
Industrial Format	Industrial Benefits	0	0	0.2	0.6	0.2
	Industrial Benefits	0.2	0.2	0.2	0.2	0.2
	Supporting Facilities	0	0	0	0.8	0.2
	Folk Art	0	0	0.2	0.6	0.2
	Cultural Stories	0	0	0.2	0.6	0.2
Cultural Activities	Athletics	0	0	0.2	0.6	0.2
	Life Sharing	0	0	0	0.6	0.4
	Learning Education	0	0	0	0.4	0.6
Quality of landscape features	Featured Buildings	0	0.4	0.4	0.2	0
	Ecological Landscape	0	0	0.4	0.6	0
	Historic District	0	0	0	0.6	0.4
Featured Event Space	Children's activity space	0	0	0.2	0.2	0.6
	Youth Activity Space	0	0	0	0.4	0.6
	Senior Activity Space	0	0	0.4	0.4	0.2
Cultural Facilities	Community Activity Center	0	0	0.4	0.4	0.2
	Table Tennis, Billiards Room	0	0	0	0.6	0.4

Chess and Card Activity Room	0	0	0	0.8	0.2
Library	0	0	0	0.2	0.8
Bulletin Board	0	0	0.4	0.4	0.2

3.3.3. Analysis of Ratings Results

According to the results of the demand questionnaire survey, the primary demand of the turbine plant community is to restore the dilapidated residential buildings, improve the supporting services, and give priority to solving the problems of encroached green space and insufficient parking spaces. According to the results of the asset evaluation survey of the turbine plant community, among the physical assets, the highest scores are community location and road traffic. The community is located in the central area of Harbin City, close to important nodes of the city, and has a large location advantage and convenient transportation conditions. Among the social assets, the assets with lower scores are community organization and social association, indicating that in future community renewal work, we should focus on community organization and strengthen residents' participation. Among cultural assets, the community is rich in humanistic heritage, and it is important to focus on enriching community activities and enhancing the sense of community belonging. Political assets guide community development, and a combination of top-down guidance and bottom-up initiatives should be paid attention to in the community work of the turbine plant.

3.4. Update Strategy

3.4.1. Pluralistic participation

(1) Community Planner Engagement

The expert network formed by community planners can effectively identify and mobilize community assets, dig deeper into community assets, and analyze community issues from a professional perspective. The turbine plant community has a heritage of industrial culture, and community renewal involving planners can effectively preserve and promote the spirit of the industrial community and achieve full process participation in project planning, program design, public engagement, and construction and maintenance.

(2) Establishment of a planning committee

The establishment of the community renewal organization focuses on the integration of resources and the formation of a multi-interest planning committee. The core members of the turbine plant community planning committee should be composed of community neighborhood committee representatives, homeowners' committee representatives, community planner team representatives, community volunteer representatives, and property company representatives, and other members to promote community development through collective action.

3.4.2. Cultural Catalyst

(1) Protecting the heritage of industrial culture

The industrial heritage culture is the characteristic culture of the turbine plant community. The preservation and activation of industrial historical space needs to ensure the originality and integrity, the restoration of important buildings and historical space with a basis, the continuation of the original spatial texture, the integration with the rhythm of modern life, and the adaptive use of historical space to better reflect the value of industrial heritage.

(2) Establishing special public spaces

By extracting industrial imagery to create the characteristic space of the turbine plant community, combining the activity characteristics of people of different age groups, creating different themed scene spaces, promoting the interaction between people and space, conveying the quality of space and community spirit through the characteristic space, and improving the residents' sense of happiness and belonging.

3.4.3. Creating a Sense of community belonging

(1) Coordinate resource deployment

Integrating turbine plant community assets, realizing resource deployment through planning committees, creating life scenarios, expanding new carriers of assets, internalizing resource maps, and realizing effective links between demand and assets through system integration.

(2) Building a sense of community belonging

Residents of the turbine plant community share a common historical memory and cultural heritage. By improving security management, we enhance residents' sense of security; by improving the living environment, we improve residents' sense of comfort; by creating scenes and providing a variety of community activities, we promote residents' interaction and strengthen the sense of communication; by encouraging residents' participation in community affairs, we form residents' sense of accomplishment and allow residents' emotions to coexist with community life.

4. Conclusion

The study finds that taking the turbine plant community as an example, the asset types of old industrial communities include political assets, cultural assets, material assets, and social assets, clarifies community governance transformation needs, constructs asset database and evaluation system, taps community development potential, promotes endogenous community development, and provides a basis for future community renewal. The paper enriches the theoretical study of asset-based theory in community development models in northern regions and has certain implications for the renewal governance of old industrial communities.

5. References

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