

Original Research

Constructing an Evaluation Index System of a Contemporary Green Community Based on Spatial Justice

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Abstract

The green community is an important microeconomic sector for the ecological civilization. It is the basic component of China and an important incubation space for green development methods and lifestyle. Spatial justice theory is guided by historical materialism, and is the spatialization of social justice, which regards space as a “physical-spiritual-social” complex, and is similar to the idea of ecological civilization, which pursues the harmonious symbiosis of “people-nature-society”. Therefore, it is more appropriate to take spatial justice theory as the theoretical basis for green community evaluation. The existing green community evaluation system at home and abroad focuses on green buildings and ecological landscapes, paying less attention to the evaluation of the humanistic spirit and social governance dimensions. Thus, this study evaluates the contemporary Chinese green community evaluation using 4 guidelines, 16 program indicators, and multiple observation indices of the three dimensions (i.e., people, nature, and society), that is, the evaluation system of multiple observation indicators. Furthermore, this study uses the analytic hierarchy process to quantify the indicators, determine the weights, make a classification, provide a relatively feasible method for the green community evaluation indicators, and regulate the construction of green communities from the perspective of total spatialism.

Keywords: Green community, ecological civilization, spatial justice theory, hierarchical analysis

Introduction

The 2030 Sustainable Development Agenda" has identified "make cities and human settlements inclusive, safe, resilient and sustainable" as an important goal. The 19th National Report of the Party explicitly

proposed the leading strategy to create green communities to promote green development methods and lifestyle. Moreover, the central departments have introduced the “Green Community Creation Action Plan”, indicating that the green community is created in a new era of ecological civilization, an important topic of construction. The green community evaluation index system has guidelines, predictions, evaluations, and other functions in creating work; it is also a guide used to create jobs. The earliest evaluation index system

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in the world is the United States' (US's) LEED-ND community development system (Leadership in Energy and Environmental Design-Neighborhood Development, 2009; hereinafter referred to as the US system), focusing on community location and green infrastructure. [1] Based on the building research establishment environmental assessment method (BREEM), the first green building evaluation system, the United Kingdom (UK) developed the BREEM community's technical manual (hereinafter referred to as the UK system) in 2012, focusing on the evaluation of green buildings and green transportation. [2] Meanwhile, the Chinese green community evaluation began in 2001, and the most extensive application is the "China Green Low Carbon Affairs Technical Assessment Manual" established by the Chinese National Industry and Commerce. From the perspective of historical materialism, green communities are essentially an ecologically oriented overall space, and realizing the broadest spatial justice has become the essence of creating green communities. Moreover, the construction of the contemporary Chinese green community evaluation index system should adhere to the Marxist spatial justice ideas. Based on the comprehensive analysis of the existing evaluation index systems at home and abroad, the construction of a scientific and tactic evaluation system and precise measurement of creation work will obtain effective and sufficient results with this further development of the green community.

Methods

The Comparative Analysis Approach

The comparative analysis approach aims at searching for similarity and variance among units of analysis. This approach commonly involves the description and explanation of similarities and differences of conditions or outcomes among large-scale social units. Through the comparative analysis of the green community evaluation index systems in the United States, the United Kingdom, and China, it will help to further build a more scientific, reasonable and comprehensive green community evaluation index system.

Neighborhood Development Mode and Infrastructure Building as the Core of the Evaluation System

The assessment scope of the US system includes residential buildings, public facilities, and multipurpose regional spaces in the entire community. It also involves the community's social and cultural attributes. LEED-ND, the latest and highest-level evaluation system in LEED, launched the draft in 2005 and was finalized in 2009.

Analysis of the LEED-ND System

Because of the disintegration of native community relationships, the deterioration of environmental conditions has received much attention from all societal sectors, including the real estate market, which is also aware of the need for green buildings. The US system has been established with a community rating based on four levels, namely, platinum (80 and above rating), gold (60-79 rating), silver (50-59 rating), and certified levels (40-49 rating), with six possible innovative design processes. Three system indicators are included in this system (i.e., smart location and linkage, neighborhood pattern and design, and green infrastructure and buildings) as the basic score. Moreover, for two reward indicators (i.e., innovation and design process, and regional priority credit), 10 points are added, which totals 110 points for each system. The indicator comprises different quantities of prerequisites and specific indicators (Table 1). Unlike the UK system's construction process, the three steps of the US system are focused on whether the construction requirements and the mutual restriction of the legal documents of the agency meet the standards.

The most prominent features of the US system are that the issue of the evaluation system is clear and that more interesting environments and short blocks are given to pedestrians in a traffic approach geared to occupy an essential position throughout the indicator system. The maximum average block of the integrated network is 1500 ft (155 m), and the ideal maximum uninterrupted area is not greater than 450 ft (135 m). Moreover, the spacing of the cross street is 500-600 ft (180-245 m), whereas the spacing between each street does not exceed 800 ft (245 m) (after the reference list). With the clear provisions of community street construction, compact development and encouragement of green travel methods for walking have distinctive problems. The indicator system gives the local government much freedom in implementation. The US system is not a national standard in that it neglects comprehensive planning of the partition and that it is not used to certify the evaluation system of regional planning or other policy tools. This is because land control and planning construction in the US are largely led by the local government because of the different geographical, historical, and cultural environments. In this way, we can easily characterize the areas that covered by the entire assessment system. Therefore, the US system is not a policy tool for the four levels; contrastingly, it is a voluntary leadership standard. Local governments should consider local conditions and public-private partners in the community to discuss the use of this indicator system. Further, the system could be used to analyze existing development regulations, such as partition regulations, development standards, landscape requirements, construction regulations, and integrated planning that "help" sustainable development.

Table 1. LEED-ND community evaluation development project list.

Smart location and linkage (27 possible points)		
Prerequisite 1	Smart location	Required
Prerequisite 2	Imperiled species and ecological community conservation	Required
Prerequisite 3	Wetland and water body conservation	Required
Prerequisite 4	Agricultural land conservation	Required
Prerequisite 5	Floodplain avoidance	Required
Credit 1	Preferred locations	10
Credit 2	Locations with reduced automobile dependence	7
Credit...
Neighborhood pattern and design (44 possible points)		
Prerequisite 1	Walkable streets	Required
Prerequisite 2	Compact development	Required
Prerequisite 3	Connected and open community	Required
Credit 1	Walkable streets	12
Credit 2	Compact development	6
Credit 3	Mixed-income diverse communities	7
Credit...
Green infrastructure and buildings (29 possible points)		
Prerequisite 1	Certified green building	Required
Prerequisite 2	Minimum building energy efficiency	Required
Prerequisite 3	Minimum building water efficiency	Required
Prerequisite 4	Construction activity pollution prevention	Required
Credit 1	Certified green buildings	5
Credit 2	Stormwater management	4
Credit...

Source: www.usgbc.org

Additionally, the weight calculation method of the US system is simple and operable. This indicator system has made a detailed interpretation of how each indicator evaluates; the system is implemented in quantified standards and comes equipped with a complete illustration. Moreover, the system uses the primary linear weight metric system. The score is an integer, without a negative, fixed weight, and without a personal project score. In addition, the rating system has 100 basis points; innovation and design processes and regional priority points provide up to 10 points (after the reference list). The specific community evaluation method is based on LEED-ND professional certification personnel's judgment and is operative.

The US system is jointly launched by the US Green Building Council (USGBC), the Congress for the New Urbanism, and the Natural Resources Defense Council. Moreover, the development of the evaluation system is managed and executed by USGBC employees and the LEED Community Development Core Committee,

including the review and input of the many technical advisory group members, and the LEED steering committee supervises its work. The establishment of the US system provided a reliable technical route for every green community construction. As an evaluation system for community development characterized by smart, healthy and green, the system focuses on intelligent positioning, neighborhood models and design, and green infrastructure and buildings. Moreover, it realizes compact urban development from small to large scale in controlling urban malaises, such as the blind expansion of the city and the proliferation of private cars.

The UK Evaluation System with Green Buildings and Traffic as the Core

Rapid industrialization brought certain economic benefits but led to unprecedented environmental pollution. Particularly after the London smog incident,

Table 2. Category, goals, and weights of British indicators.

Category	Aim	Weight percentage (%)
Governance (GO)	Promotes community involvement in decisions affecting the design, construction, operation, and long-term of the development.	9.3
Social and economic wellbeing (SE)	Local economy: To create a healthy economy (employment opportunities and thriving business).	14.8
	Social wellbeing: To ensure a socially cohesive community.	17.1
	Environmental conditions: To minimize the impacts of environmental conditions on the health and wellbeing of occupants.	10.8
Resource and Energy (RE)	Addresses the sustainable use of natural resources and the reduction of carbon emissions.	21.6
Land use and Ecology (LE)	Encourages sustainable land use and ecological enhancement.	12.6
Transport and Movement (TM)	Addresses the design and provision of transport and movement infrastructure to encourage the use of sustainable modes of transport.	13.8

Source: www.breem.org

the world's first industrialized nation, Britain took the lead in proposing an evaluation system for green settlements. The first green building evaluation system (i.e., BREEM) was developed by the UK in 1990. The BREEM communities' technical manual evaluation system was officially established in 2012, with the greening of communities as the evaluation object. It is one of the 15 subsystems of the BREEM evaluation system. The system focuses on evaluating green buildings and green transportation [3].

Analysis of the BREEM Community System

The first-level indicators of the UK system are divided into nine parts: climate and energy, resources, transportation, ecology, commerce, community, place-shaping, construction, and innovation scores. Moreover, the system has three pillars of sustainability impact: society, economy, and environment. The impact categories are further divided into five categories: governance (GO), social and economic wellbeing (SE), resource and energy (RE), land use and ecology (LE), and transport and movement (TM) (Table 2). In the UK, community construction site selection is largely determined by the local planning department, developers, and landowners (after the reference list). Meanwhile, the construction of the BREEM community is divided into three steps. The first step is to verify the sustainability of the selected site with the developer at the site selection stage. The second step is the planning and resettling of traffic facilities and roads after the site selection is determined. The final step is for the design of architectural details. The UK system's rating benchmarks for communities are divided into six levels: outstanding, excellent, good, intermediate, passing, and no category. Under the 100-point system, the following are the criteria: 85 points or more (outstanding); 70 points or more (excellent); 55 points or more (good); 45 points or more (average); 30 points or more (pass); and 30 points or less (no category).

The purpose of establishing the UK system is to build a green community evaluation system that helps achieve the coordinated development of the environment, economy, and society. However, its parent system is based on building evaluation; thus, the system focuses on green buildings and two areas of traffic. In the entire index system, 11 evaluations are on place-shaping, accounting for 21% of the total number of indexes, which is sufficient to reflect the evaluation of buildings as the crucial factor in the index system.

In addition to paying attention to the construction and development of the community itself, the evaluation index puts huge weight on transportation, climate, and resource efficiency. The importance of this public transportation evaluation index is reflected in the reasonable configuration of urban and rural routes and station settings to achieve or exceed the commuting speeds of private cars. This would encourage people to use public transportation. This index is also important because the regulations on supporting service facilities for public transportation are detailed. The UK system requires waiting areas, which must be large enough to accommodate various potential commuters, at public transport stations. The waiting area should be well-known to the surrounding inhabitants. Further, the obstacle avoidance facilities will not hinder pedestrians, cyclists, or other users, and there should be sufficient space for wheelchair and stroller/trolley users to pass easily. The reasonable construction of waiting places for public transportation reflects concern for the welfare of people with disabilities and of different age groups, while considering other people who use green travel modes, such as walking and cycling.

Three aspects mainly reflect the rational and efficient use of resources: pre-use, during use, and post-use. "Pre-use" refers to the environmental remediation of contaminated land in the past. The UK system encourages the use of contaminated land after remediation to avoid disturbing the uncontaminated

land. During the initial field investigation process, if the expert determines potential land pollution issues, they will guide developers to conduct risk assessments on the site on the basis of best practices. They will also provide feasible recommendations (mandatory requirements) for subsequent remediation activities after determining the pollution level. Meanwhile, “during use” refers to the improvement of resource efficiency by reducing waste during the construction period and the entire development cycle in project construction. First, the government chooses low-carbon and environmentally friendly materials as an example for constructing public areas, which affects the construction and renovation of communities. In the construction process, attention should be paid to reducing waste throughout the development cycle. “Post-use” mainly refers to the management of construction waste after the project is completed. The resource efficiency includes minimizing waste at the source and ensuring customers, designers, and primary contractors evaluate the use, reuse, and recycling of materials and products inside and outside the site (after the reference list). Moreover, in the follow-up process of subsequent building maintenance and renovation requirements, the system will introduce audits of the demolition and renovation of institutionalized, hardened building materials. Moreover, the major renovation and demolition materials are evaluated for potential reuse and recycling.

Note that the establishment of the UK system signifies consideration of the regional nature of the UK, divides it into nine regions, and assigns different weights to each indicator according to each region’s actual situation. This feature has been enhanced, and the pertinence and practical operability of the system in different regions is worth learning.

Moreover, third-party evaluation and certification standards are established on top of various high-level standards in the BREEM system as a requirement for community evaluation. An independent regulatory agency and a permanent peer and market review committee supervise the operations of the UK system. By gaining market recognition for sustainable development, the system guides project development and actual construction model innovation under the regulation of a standardized model, achieve sustainable development goals in project promotion, and improve the skills of developers and designers. Architects and ordinary people’s understanding of low environmental impact buildings is an evaluation standard that describes the “target-indicator” structure of environmental, social, and economic performance.

Chinese Index System with Residential and Living Environment as the Core

The construction of green communities in China started from the construction of environmental protection communities in the 1990s. It developed on the basis of the concept of foreign green communities, and

the evaluation system followed the UK and US plans. The green community evaluation system represented by the UK and the US is based on the theoretical guidance of sustainable development, focusing on low-carbon design of buildings, space greening, energy conservation, and emission reduction, as well as environmental participation. Although it involves some cultural and management elements, the evaluation system’s focus is on the greening of physical space, which is a green community evaluation system that focuses on environmental landscapes.

The task of creating green communities has been proposed at the national level for the first time through the 2001-2005 National Environmental Publicity and Education Work Outline jointly promulgated by the Propaganda Department of the Central Committee of the Communist Party of China, the State Environmental Protection Administration, and the Ministry of Education in 2001. In 2005, the State Environmental Protection Administration commended 112 advanced communities on the creation of “green communities” across the country. In the same year, the national green community commendation standards and assessment methods comprised seven parts totaling 100 points: basic conditions, comprehensive environmental management, and supervision mechanism, prevention and control of community environmental pollution; clean and beautiful community environment, active environmental education; and high residents’ environmental awareness among residents. [4] After 2009, various provinces, municipalities, and autonomous regions have successively issued provincial and municipal green community assessment standards accordingly and conducted green community selection activities. According to incomplete statistics, there are more than 10,000 green communities at all levels in the country, and Shenzhen ranks first nationwide with 305 green communities.

Among the many evaluation systems, the “China Ecological Settlement Technology Evaluation Manual” organized by the All-China Federation of Industry and Commerce Real Estate Chamber of Commerce, Tsinghua University, in association with the Ministry of Construction Science and Technology Development Promotion Center, is currently the most widely used evaluation system in China.[5] The “Assessment Manual” has undergone four subsequent editions since the first edition was promulgated in 2001. The fourth edition was renamed “China Ecological Settlement Technical Assessment Manual,” and the evaluation target changed from architecture to residential areas. Meanwhile, the fifth edition was renamed “China Green and Low-Carbon Residential Technical Assessment Manual” (hereinafter referred to as the “Manual”). As the current index system guiding the evaluation of domestic settlements, the “Manual” sets out the following six first-level indicators: (1) settlement planning and environment, (2) energy and environment, (3) indoor environmental quality, (4) residential water

environment, (5) materials and resources, and (6) operation management. Moreover, the Manual considers promoting resource conservation (land, energy, water, and materials) and preventing environmental pollution as the basic goals of the residential area. It also considers science and technology as the forerunner, while promoting the formation of a technological innovation mechanism for green communities and providing a platform for transforming scientific and technological achievements into productivity. [6] The “Manual” sets the secondary indicators for the residential indoor environment and residential water resource environment, indicating the attention paid to the indoor environment and construction quality of the building. It also indicates the importance accorded to water environment protection and the intensive use of water resources.

(1) Content analysis of the “Manual”

The “Manual” sets out the following seven secondary indicators for residential sites: selection and planning, traffic, greening, air quality, acoustic environment, sunshine and light environment, and residential microenvironment. In particular, in terms of energy and environment, four secondary indicators have been established: energy conservation, conventional energy system optimization, renewable energy utilization, and reduction of the environmental impact of energy consumption. Meanwhile, four secondary indicators have been established for indoor air quality: air, thermal environment, light environment, and acoustic environment. For the residential water environment, five secondary indicators have been established: water use planning, water supply and drainage, recycled water utilization and sewage treatment, rainwater utilization, and greening and water use for waterscapes. For materials and resources, green building materials, local materials, and resource reuse facilities have been established. For interior decoration and garbage disposal, five secondary indicators exist. Meanwhile, five secondary indicators for operation management have been established: energy-saving, water-saving, greening, waste, and intelligent system. Among them, 86 sub-indices are in settlement planning and residential environment, with 12 essential items; 28 sub-indices are in energy and environment, with 11 essential items; and 94 sub-indices in indoor environmental quality, with 24 essential items. Moreover, of the 90 sub-indices in residential water environment, 13 items are essential, and of the 35 sub-indices in materials and resources, 4 items are essential. The 35 sub-indices have no compulsory items. On the one hand, the “Manual’s” emphasis on the necessary items of evaluation indicators can ensure the quality of the country’s green communities. On the other hand, such a setting will undoubtedly raise the threshold for constructing green communities. Among the 368 indicators in the “Manual”, most indicators are related to building evaluation, with only less than 30% related to cities and communities. Such index classification causes difficulties in completing the transition from

“green building” to “green community.” Moreover, this classification will affect the classification and guiding role of green communities in a certain sense due to the large number of indicators and wide coverage.

(2) Comment on the “Manual”

As the most influential green community evaluation index system in China, the “Manual” fully draws on the following: the LEED evaluation system (the US), the BREEM system (the UK), the ecological building guideline LNB (Germany), the NABERS environment evaluation system (Australia), GBTools (Canada), ESCALE (France), and CASBEE (Japan). The “Manual” also draws from China’s “National Comfortable Housing Demonstration Project Construction Technical Key Points,” “Residential Performance Evaluation Technical Standards,” and other related content compiled on the basis of site selection and residential, energy, and indoor environments. The assessment methods of five sub-items, including environmental quality, residential water environment, materials, and resources, are divided into three types: single assessment, stage assessment, and project assessment [5].

The “Manual” can meet the needs of China’s green community construction to a certain extent. In fact, representative construction cases have been formed in Shenzhen, Beijing, Shanghai, Xi’an, and other places. On this basis, various places are exploring the practice of green communities. China has also devised corresponding assessment indicators and implementation rules suitable for the local area. However, the following areas lacking in the evaluation system need to be improved: commercial and economic indicators; public participation indicators; attention to the economy, society, and residents’ living habits in the community; public participation in community construction and management; and simple accumulation. The scoring method fails to highlight the weights of the three indicator levels involved in the “Manual”; most indicators at all levels are biased toward principled indicators, lacking specific quantitative provisions. Thus, differences in the manual indicators during the specific implementation stage are inevitable, and inadequate understanding causes deviations.

The root of the problem is the lack of originality of the “Manual.” From the first to the fifth editions, it tends to combine the evaluation system elements of the US, the UK, Germany, Australia, and other countries, while neglecting them to fully reflect the latecomer advantage. Moreover, it criticizes different evaluation systems from theoretical basis to index selection, weight design, and practical effects. The theoretical basis of the existing evaluation system in the world is mostly sustainable development theory, circular economy theory, and new urbanism theory, among others. Moreover, it focuses on optimizing the spatial layout of traditional capitalist communities from a technical or scientific perspective and eases the need for construction, community, and planning. The social contradictions, such as spatial injustice, brought about problems. The “Manual” also

realizes capitalism's improvement and development. Various evaluation systems based on the theory of existing evaluation systems are bound to have certain standpoint and value care limitations. The construction of socialist green communities in contemporary China will adhere to the fundamental Marxist standpoints, methods, and viewpoints based on learning from outside experiences. Moreover, it will build a comprehensive and self-consistent evaluation system based on national conditions.

*Criticism of Spatial Justice
of the Existing Evaluation System*

Different types of evaluation index systems are formed under the guidance of certain theoretical logic, which is the abstraction and measurement of objective facts by subjective theoretical logic. The healthy and orderly development of green communities is bound to be inseparable from the existence of a rigorous and comprehensive evaluation index system. Moreover, a scientific theory is the prerequisite basis for its generation. The theoretical bases of the green community evaluation index system in UK and the US are mainly green environmentalism, sustainable development theory, circular economy theory, etc., which mainly focuses on the decarbonization and greening of the physical space of the buildings and settlements, and simplifies the community into a physical living space, which ignores the other attributes of the community as a social production space, and also limits the evaluation of the green community to the interior of a certain community system, without integrating the community into the vision of the whole urban ecosystem. From the perspective of development, a unidimensional evaluation system appears in the initial stage of the emergence of something. However, as things develop, its limitations become increasingly prominent, and a new system will emerge. The traditional evaluation system has opened a precedent for the green construction of community space to a certain extent. However, little attention is paid to other dimensions of community space and the relationship between the community and the overall urban ecological system; hence, it is not conducive to creating community space for a better life.

As some scholars have pointed out, with the rapid development of urbanization, the process of urban spatial production and resource distribution in China contains the risk of spatial injustice. [7] Spatial justice as the value tendency of green community building. The Marxian theory of spatial justice takes the care of spatial subjects and their social practices as a basic guideline. Living space, as a place of human existence and an object of transformation, is not only a microcosmic field for people to enjoy spatial rights and interests and exercise spatial rights, but also a basic unit of spatial production and spatial use. In the pursuit of spatial justice of spatial governance, some scholars have

proposed that resources of social value, such as public facilities, transportation, medical care, education and ecology, should be allocated reasonably and fairly in urban space. [8] Some scholars have also looked at the micro-right to the city as a humanistic consideration of spatial justice. [9] The theory of spatial justice, guided by historical materialism, is a spatialization of social justice, viewing space as a "physical-spiritual-social" synthesis, which is similar to the idea of ecological civilization, which pursues the harmonious symbiosis of "human- nature-society". Therefore, using it as the theoretical basis for the evaluation index system of green communities in contemporary China is more appropriate.

(1) Era of spatial justice

Since the 20th century, the neo-Marxists, represented by Henri Lefebvre and David Harvey, have created the "urban Marxism" trend of thought that understands the city as the overall composition of human society and has promoted historical materialism as an important theoretical paradigm for analyzing modern cities. [10] Urban Marxism believes that historical materialist urban research should not only be limited to understanding cities through the division of labor and production methods but should also construct a physically, spiritually, and socially unified urban concept, examining the cities in the context of the social totality that is constituted by human productive activities. In the social totality constituted by activities, the city is the organic body of society, and space production itself is a part of social development. Social development is analyzed through the overall urban concept. [11] The core of urban Marxism lies in reconstructing historical materialism, which should have spatial connotations. Moreover, the dialectical opening of "the basic form of all existence is space and time" in "Anti-Duhring" is the urban issue – urban space is not only a geographical space with physical and natural attributes but also a social and historical space as it is the sum of physics, spirit (culture), and society. The social and historical urban space has naturally entered the spatial of Marxist justice, giving birth to Marxist urban space justice (referred to as spatial justice). It originates from Marx and Engels' judgments on the spatial division, differentiation, and opposition of space resulting from space materialization, space capitalization, space politicization, and space power in a capitalist space production. The goal of free and comprehensive development is to respect and protect people's spatial rights and interests and to realize the fair distribution of spatial resources, the rational and orderly production of space, and the efficient governance of spatial affairs. In the report of the 20th National Congress of the Communist Party of China (CPC), Xi Jinping emphasized that by 2035, a happier and better life for the people is one of the general goals of China's development. [12] Some scholars in China believe that spatial justice requires the exertion of the wisdom and quality of the main body of spatial production, so that the spirit of spatial ethics can be transformed into

a realistic moral existence and promote the harmony of ethical life in social space. [13] The subject of spatial justice is human, emphasizing humans' responsibility for both the ecosystem and civilized society. The fair spatial relationships between humans, humans and society, and humans and nature must be established.

(2) The necessity of green community evaluation guided by spatial justice

From the perspective of historical materialism, the green community is, in its essence, a kind of overall space oriented toward ecologicalization. The realization of the most extensive spatial justice has become the meaning of creating the green community. At the academic level, the three-dimensional spatial justice of "physics-spirituality-society" is consistent with the concept of green community in the era of ecological civilization. The green community derived from the concept of socialist ecological civilization is a community of life that realizes the harmonious coexistence and co-prosperity of humans, society, and nature. The integration of an ecological civilization system and ecological value and cultural concepts is a collection of "ecological people" integrating "green thinking-green action-green personality", [14] a new governance system shared by the party, government, enterprises, and society. It is the micro-foundation and concrete existence of socialist ecological civilization and modern state governance. Therefore, the construction of the green community rating system in contemporary China should not be limited to the ecological landscape level or the circular economy level. Moreover, the multidimensional view of spatial justice should be used as its theoretical basis and logical framework. At the practical level, the multidimensional spatial justice concept is consistent with the "Green Community Creation Action Plan" recently promulgated by the party and the state. In July 2020, the following six departments were deployed under the "Overall Plan of Action for the Creation of Green Living": the Ministry of Housing and Urban-Rural Development, the National Development and Reform Commission, the Ministry of Civil Affairs, the Ministry of Public Security, the Ministry of Ecology and Environment, and the State Administration for Market Supervision and Administration. The "Green Community Creation Action Plan" was jointly issued. The overall action plan focuses on the creation of a green community in contemporary China in six aspects, including the construction and improvement mechanism of the community's living environment, greening of community infrastructure, livable environment for the community, community information intelligentization, and the green culture of the community (Table 3). This scheme is consistent with the basic principles of spatial justice at the macro-level, transcending the traditional single-dimensional cognition of green communities and focusing on standardizing the construction of green communities from the perspective of overall space. In summary, taking spatial justice as the theoretical basis for the construction of green communities in

contemporary China is supported by academic theory and confirmed by practice.

China is launching the creation of green communities and simultaneously a community evaluation system reflecting the requirements of spatial justice. The healthy community evaluation system, originated from the World Health Organization's initiative in the 1980s, has also emerged in China. It is the "cell engineering" of the healthy city movement, which mainly covers public health and ecological environment protection, planning and construction, and social management. On March 21, 2020, the first healthy community evaluation standard, "Healthy Community Evaluation Standard," jointly compiled by the China Academy of Building Research, the China Urban Science Research Association, and other units, was released. The standards mainly include air, water, comfort (e.g., sound, six types of indicators including light and heat), fitness, humanities (e.g., communication, psychology, and fitness for the old and young), and services (management, food, activities, and publicity). [15] The proposed healthy community standards also include 10 concepts, including light, sports, thermal comfort, acoustic environment, materials, mental, community, and innovation (after the reference list). The healthy community evaluation system is consistent with the principles of spatial justice. It integrates ecological resources, human elements, and governance elements and has a certain reference value for constructing the green community evaluation index system in contemporary China.

The Analytic Hierarchy Process

The analytic hierarchy process divides the constituent elements of a complex problem into interconnected and orderly levels, based on which qualitative and quantitative decision-making analyses of subjective judgments of objective reality are carried out at present to determine qualitative goals quantitatively. As one of the most effective analysis methods, the quantitative method is suitable for the weight calculation and ranking of the evaluation index system of green communities.

Evaluation Index System for Green Communities in Contemporary China Oriented by Spatial Justice

As aforementioned, the spatial justice derived from historical materialism has a strong guiding value in creating green communities. It is an extremely "qualified" theoretical paradigm from both the academic and practical levels. Constructing a green community evaluation index system that conforms to spatial justice can effectively overcome the injustice of the community space caused by the traditional evaluation index system. It also leads to the construction of green communities scientifically, reasonably, and comprehensively. Thus, it is can better protect the green space rights of the people.

(1) Determining the framework of the green community evaluation index system

Table 3. Comparison of rating indicators for green communities in China and other countries based on spatial justice.

	Physical space	Points	Spiritual space	Points	Social space	Points			
LEED-ND (2009)	1. Smart location and linkage	27			Community model and design				
	2. Neighborhood pattern and design	41 except for score items (12/15)			Community public participation		15		
	3. Green infrastructure and buildings	29			Community school credit		12		
	4. Innovation and design process	6							
	5. Regional priority credit	4							
BREEM Communities (2012)	1. Climate and energy	24						Community (Social impact assessment, community participation, sustainable lifestyle)	10.5
	2. Site shaping	24.3							
	3. Ecology	7.2							
	4. Transportation	30						Business (Community investment, employment, sustainable development, and so on)	7.8
	5. Resource	21.6							
	6. Architecture	4.5							
China Ecological Settlement Technology Evaluation Manual (2011)	1. Site selection and residential environment	15	2. Community model C13		Community model C15 (public participation)	2			
	2. Community model (except C13, C15, and C16)	13	Regional features	16					
	3. Greening	10	Community Environmental Education	2					
	4. Street traffic	9	Cultivate community green culture	13-16					
	5. Water resources environment	12			Domestic waste management	4			
	6. Energy	16							
	7. Building material resources	5							
	8. Environmental quality	12							
Green Community Create an action plan (2020) (16 creation standards)	1. Recommend the greening of community infrastructure	4-6			Establish and improve a mechanism for constructing and improving community human settlements	1-3			
	2. Create a livable environment in the community	7-10			Improve the level of community informatization and intelligence	11-12			

Source: Author's own work.

In the past, some scholars regarded the three dimensions of spatial thinking of ecological and ecological cycle development, spatial connection between people, community awareness and community planning as the basic principles of community evaluation, [16] but there is a lack of a scientific and clear theoretical support. Starting from the three-dimensional spatial justice theory of “physics-spirituality-society,” the contemporary Chinese green community evaluation index system (hereinafter referred to as the “new system”) will systematically surpass the existing evaluation index system based on ideology and indicator elements. It will detail not only the theoretical cornerstones and analytical framework of the evaluation index system but also the operable measurement indexes, thereby realizing the organic unity of “evaluation target-evaluation concept-evaluation index” (Fig. 1).

Physical evaluation has always been the main or even the entire content of green community evaluation. The ecological landscape is the material basis and external manifestation of spatial justice, whereas spatial justice is the value care and ethical dimension of ecological landscape construction in green communities. Spatial justice without a good ecological landscape is an impossible goal, and ecological landscapes that do not pursue spatial justice are destined to become a “royal garden” belonging to only a few people. The evaluation indicators of the new system at the physical level mainly include two levels: green buildings and green transportation. Green buildings not only include the basic requirements of ecological civilization in the site selection, design, construction, and use of buildings in the community but also posits that the community, as a component of the entire regional ecosystem, must comply with the laws of ecological development and environmental governance of the entire region. Moreover, unjust situations in practice, such as some communities wanting only to encroach upon the ecological spatial resources of surrounding communities to achieve greening and other unjust situations, must be avoided. Green transportation is an evaluation index oriented toward modern urban issues, such as traffic congestion, and it has always been the focus of the traditional evaluation index system. If a green community is the terminal of a green city, green transportation is the vascular organization that connects the entire city. Some scholars make evaluation constraints on the environmental construction of green transportation from four aspects: diversity, accessibility, comfort and safety. [17] Green transportation is based more on overall urban greening, and it proposes clear demands on the construction of green communities.

The evaluation of the humanistic spirit appeared late in the evaluation of green communities and received little attention. This resulted from the short history of the development of green communities and is directly related to the lack of scientific systems in the development of green communities. The development

of green communities in the West underwent roughly three stages: the garden community focusing on hardware construction from the end of the 19th century to the 1970s, the sustainable community emphasizing the construction of soft environments from the 1970s to the beginning of the 21st century, and the current era of big data and smart, low-carbon community. The construction of green communities in the West focuses on the low-carbon design of buildings, space greening, energy saving, emission reduction, and environmental participation. Although culture and public participation are valued in later development, the evaluation system mainly focuses on hardware facilities. Greening is a green community concept that focuses on the environmental landscape. The cultivation and practice of ecological culture is an important dimension of spatial justice and a major difference from the traditional evaluation system. As the space carrier of green production and lifestyles, the green community has an important function in realizing social and cultural innovation and the ecological shift of people’s way of thinking. The current cultural construction of green communities focuses on two aspects. The first is to build a three-dimensional and multidimensional ecological culture education system, which can improve people’s awareness of ecological protection and behavior and create a good social atmosphere. The second is to pay attention toward protecting the historical and cultural resources in the community. Moreover, the community construction plan should fully respect the regional cultural characteristics. This is also to avoid the “one-thousand-one side” and “existence without interior” in the construction of green communities in mainly countries.[18] Building a diversified, heterogeneous, and distinctive environment under the comprehensive consideration of local culture and location is a must – a green community with Chinese characteristics.

A green community evaluation incorporates the dimensions or elements of social governance, which is determined by the overall social living space of the community. Especially in the 20th century, a new public management movement with “social autonomy” as the core emerged in Western countries, and social governance factors started appearing in the community evaluation index system. Spatial justice is an idea closely related to social justice. It is “a term of power relations involving the distribution of resources, rights, and material space”. [19] Some scholars have summarized the principles for the development of NGOs at the level of green community governance in China from the experience of Canada’s green community entrepreneurship on green community governance participation. [20] There are also scholars who propose to promote the level of informatization of green communities with the help of infrastructure and building facilities, information infrastructure, smart platforms and databases, smart special application systems and related guarantee system construction.[21] Therefore,

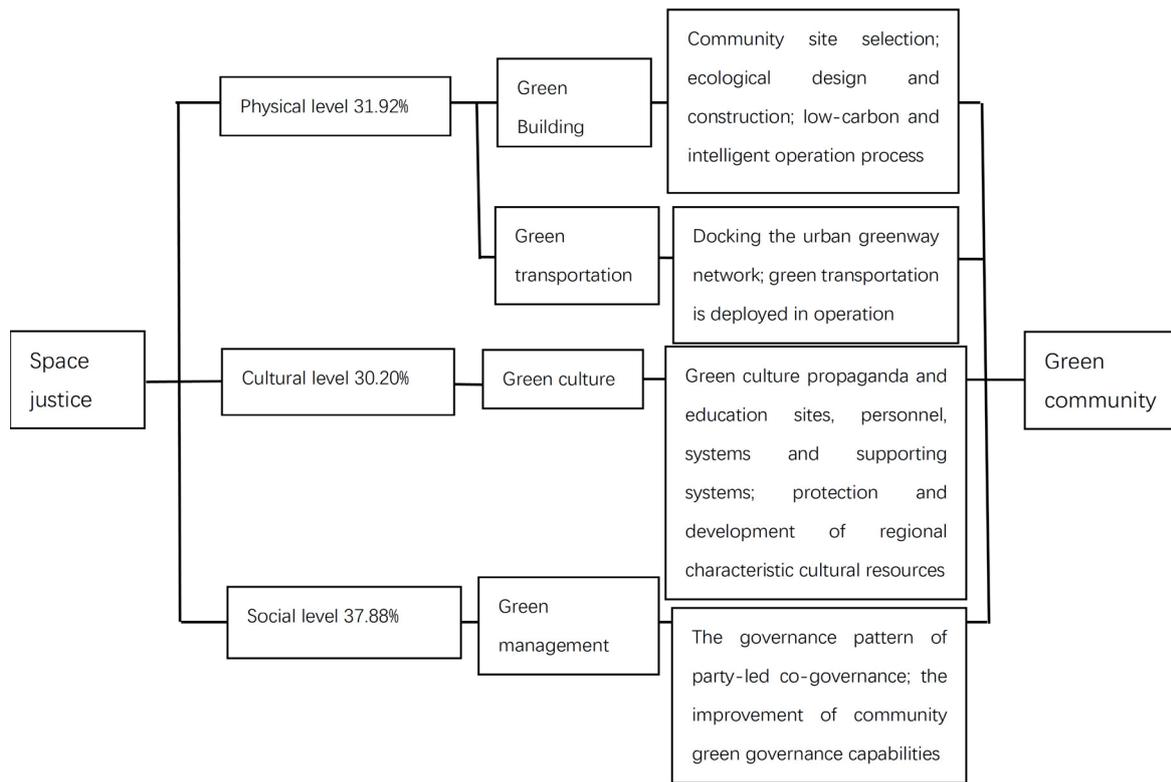


Fig. 1. Green community evaluation system structure based on spatial justice.

a key point of the green community evaluation system based on spatial justice is to base itself on modern national governance and improve the community's green governance capabilities and governance system. However, the community governance evaluation in the existing evaluation system focuses on public participation in community site selection and design models (Table 3). Such an evaluation of the social governance of green communities is relatively limited and not sufficiently comprehensive. Marx's practical materialism posits that people's social life practice acts on the environment and accepts environmental constraints while people transform themselves and their social relationships, thereby transforming the environment. Green community construction under the statute of spatial justice must optimize the micro-environment of the living space and construct the consensus of the spatial subjects from the aspect of the material basis of social spatial production and resource allocation, so as to do a good job of the social system project of spatial construction in the organic combination of material and spiritual civilization. [22] Therefore, the evaluation of social governance that must be a concern in the evaluation of green communities in contemporary China will no longer only be the "appearance" of social elements but must also be designed and measured from the perspective of realizing spatial justice. Then, in practice, the public's rights and interests in space effectively guarantee and promote the emergence of a harmonious symbiosis pattern of "man-nature-society."

(2) Selecting an evaluation index system based on analytic hierarchy process

The program indicators denote simple differentiation under the criteria indicators. They are also universal indicators that could be covered, considering the actual construction of China's green communities and different geographic regions. The setting of the observation indicators under each project indicator updates and supplements the original evaluation basis. In addition to the actual evaluation of the green community construction, the observation indicators lead to the future development direction. In contrast to the "China Green and Low-Carbon Residential Technical Assessment Manual" (Fifth Edition), which focuses on indoor environmental quality and residential water environment, the setting of this indicator system will make residents' lifestyles green and yield low-carbon energy consumption. Energy conservation is the focus. On the one hand, the evaluation basis for residential area selection and the surrounding environment in the original index system has been relatively comprehensive. On the other, residents' requirements for constructing green communities have shifted from the construction of material foundations to the transformation of lifestyles and the cultivation of green behavior. Based on the reality of China's green communities and the actual demands of residents, the standards in Table 4 are drawn.

Table 4. The specific content of the green community construction evaluation system.

Guidelines	Program indicators	Observation indexes
Green Management	Community governance structure led by the party	Relying on the party-mass service center in the community, organize mobilization, resource linking and service linking under the leadership of the primary party organization, making it a leader in the creation and governance of green communities
	Improved community green governance capabilities	Encourage the establishment of spontaneous organizations of community residents under the leadership of party members to participate in important decision-making and daily activities as representatives of community residents; simultaneously, follow up the professional training of participating personnel of social organizations and community foundations to improve their governance capabilities
	Management of factories and enterprises in the community	Evaluate the environmental impact of factories and enterprises in the community, follow up and assess the factories and enterprises that meet the requirements every six months, and use the number and content of complaints from surrounding residents as the basis for assessment
	Intelligent management	Whether the monitoring of the community environment, including intelligent security and properties, and the management methods that provide convenience to residents' lives, and the planning and management of internal consumption, internal circulation, and rainwater in the community reflect green, energy-saving, low-carbon and environmental protection
Green Building	Location planning	Comply with the overall planning of urban ecological governance; meet the requirements of ecological environment science with surrounding communities and buildings; and regard ecological beauty as an important goal of community site selection
	Main building energy saving	Energy-saving performance in the material selection phase and construction phase of the main building of the green community, including the renovation of old buildings
	Routine energy consumption optimization	Whether the choice of energy transmission, lighting cold and hot, and hot water energy conversion methods involved in the community reflects low-carbon and energy-saving
	Low-carbon indoor materials	Selection of interior decoration consumables for residential areas, factories, and corporate offices in the community, and whether they reflect green energy conservation during use
Green Transportation	Public transport station layout	Whether the overall connection and distribution of public transportation stations can achieve the purpose of reducing the use of private cars
	Private vehicle parking planning	Whether the planning and management of private cars and public parking spaces in the community is reasonable to avoid traffic jams and insufficient parking spaces during peak hours
	Vehicle noise standards in the community	Refer to the noise management standards for residential areas by local public security and traffic management departments and use the number of residents' complaints about vehicle noise as the basis for evaluation
	The degree of integration of the urban transportation network	Fully access to the urban greenway network; the cooperation of public bicycles, buses, and subways within the community, and the reflection of the pertinence and convenience of the corresponding sites for the infrastructure of different age groups
Green Culture	Community environmental education universal	Popularize environmental education for residents of all ages in the community (e.g., kindergartens, elementary schools, and middle schools), using school lectures, reading rooms, practical interactions, and environmental education display windows in the community as the basis for evaluation
	Permanent publicity of green cultural venues and facilities (cyberspace), personnel	Regarding the training and equipment of the staff related to fixed publicity cultural venues and facilities as an important new force for green culture communication; at the same time, attention should be paid to related personnel in cyberspace and online media to form an "online + offline" collaborative model
	Green lifestyle education and recognition	With the help of fixed publicity venues, hardware facilities and online media in the community to popularize the Green Life Convention, it also encourages and commends the demonstration green households and units of energy conservation and green consumption in the community
	Protection and development of community cultural resources	Protection of historical and cultural relics and other related historical and cultural resources in the community

Source: Author's own work.

Results and Discussion

Results

Determining the Index Weight of the Evaluation System

In this study, the author invited 10 relevant experts and scholars in domestic ecology, environmental economics, environmental ethics, urban planning, among others, to subjectively empower the criteria and indicators of the evaluation system and obtain the evaluation indicators for green community construction through normalization. The weights of criteria indicators in the system are presented in Table 5, and the scales are presented in Table 6. Simultaneously, the experts and scholars underscored the relative importance of the four sets of program indicators according to Table 7 and obtained four judgment matrices for these sets.

Table 5. The weight of the criterion index.

Indicator name	Weights
Green management	0.3788
Green building	0.1816
Green transportation	0.1376
Green culture	0.3020

Table 6. Scale table.

Scaling M_{ij}	Definition
1	Factors M_i and M_j are equally important
3	The factor M_i is slightly more important than M_j
5	The factor M_i is moderately more important than M_j
7	The factor M_i is more important than M_j
9	The factor M_i is significantly more important than M_j
2, 4, 6, 8	Between the importance of the two
Reciprocal	When the factor M_i is compared with M_j , The scale is $M_{ij} = 1/M_{ji}$

Table 7. Green management program indicator weight.

Indicator name	Weights
Community governance structure led by the party	0.1771
Improved community green governance capabilities	0.0966
Management of factories and enterprises in the community	0.0700
Intelligent management	0.0351

This study adds 10 to the judgment matrix obtained by the experts and scholars and then divides it by 10. The judgment matrix used to calculate the weight of the project indicators is obtained, and the four groups of indicators are tested for consistency.

Taking the first group of principal indicators of green management as an example, the author recorded the judgment matrix of its plan index as A.

$$A = \begin{vmatrix} 1 & 2.914 & 1.9712 & 4.2302 \\ 0.332 & 1 & 1.896 & 3.102 \\ 0.4932 & 0.498 & 1 & 2.2103 \\ 0.248 & 0.2931 & 0.503 & 1 \end{vmatrix}$$

The maximum eigenvalue of A is 4.1049 and the unitization of the corresponding feature vector is (1.9666, 1.0481, 0.7470, and 0.3763), The values are then multiplied by the weight 0.3788 to obtain the weight of the project indicator to which green management belongs (Table 7).

Next, the author checks the consistency of the judgment matrix, the purpose of which is to find whether contradictions exist in the judgment matrices of different indicators. Finally, whether the judgment matrix passes the consistency test according to its consistency ratio CR is determined. If the consistency of the judgment matrix CR is given by $CR = \frac{CI}{RI} < 0.1$, the judgment matrix is valid; if $CR = \frac{CI}{RI} > 0.1$, the judgment matrix test fails until satisfactory consistency is obtained. Among them, the calculation formula of the consistency index CI is $CI = \frac{\lambda_{max} - n}{n - 1}$, with λ_{max} being the maximum characteristic root of the judgment matrix. RI (Random Index) is called the average random consistency index, it is only related to the matrix order n. Compare the order of the matrix with the existing table (Table 8). Therefore, the consistency ratio of the green management judgment matrix is 0.04 (less than 0.1), which is valid. Likewise, the weights of the project indicators of green building, green transportation, and green culture can be calculated (Table 9); the consistency ratios of their judgment matrices are all less than 0.1, indicating consistency of the results.

Determining the Evaluation Index Results

Therefore, the evaluation results of the green community construction set in the previous article are judged according to the comprehensive score of the percentile system. When evaluating green community construction, the experts' scores are calculated according to different weights (Table 10), and then, the weights after conversion are calculated. The scores are summarized in Table 10.

According to the suggestions of experts and scholars, the final score of green community construction is set to 100 points. Moreover, community evaluation is divided into two categories: green communities

Table 8. Consistency check of RI value.

Order	1	2	3	4	5	6	7
RI	0	0	0.52	0.89	1.12	1.26	1.36

Table 9. Programs indicator weight.

Program name	Indicator name	Weights
Green building	Location planning	0.0272
	Main building energy saving	0.0547
	Routine energy consumption optimization	0.0784
	Low-carbon indoor materials	0.0214
Green transportation	Public transportation station layout	0.0632
	Private vehicle-parking planning	0.0216
	Vehicle noise standards in the community	0.0122
	The degree of integration of the urban transportation network	0.0405
Green culture	Community environmental education universal	0.0848
	Permanent publicity of green cultural venues and facilities (cyberspace), personnel	0.1394
	Green lifestyle education and recognition	0.0455
	Protection and development of community cultural resources	0.0323

Table 10. Scoring weights of evaluation indicators for green community creation.

Principal indicators and weights	Program indicators and weights	Full score
Green management (0.3788)	Community governance structure led by the party (0.1771)	100
	Improved community green governance capabilities (0.0966)	100
	Management of factories and enterprises in the community (0.0700)	100
	Intelligent management (0.0351)	100
Green building (0.1816)	Location planning (0.0272)	100
	Main building energy saving (0.0547)	100
	Routine energy consumption optimization (0.0784)	100
	Low-carbon indoor materials (0.0214)	100
Green transportation (0.1376)	Public transportation station layout (0.0632)	100
	Private vehicle parking planning (0.0216)	100
	Vehicle noise standards in the community (0.0122)	100
	The degree of integration of the urban transportation network (0.0405)	100
Green culture (0.3020)	Community environmental education universal (0.0848)	100
	Permanent publicity of green cultural venues and facilities (cyberspace), personnel (0.1394)	100
	Green lifestyle education and recognition (0.0455)	100
	Protection and development of community cultural resources (0.0323)	100

Table 11. Green community rating scale.

Project	Green community				Non-green community
	First level	Second level	Third level	Fourth level	
State	Outstanding	Excellent	Great	Good	Failed
Fraction	90-100	80-89	70-79	60-69	0-59

and non-green communities according to the scores. The green communities are further divided into four grades according to the score level (Table 11).

Discussion

Green community creation is the main embodiment and component of ecological civilization construction in the new era, and the evaluation index system of green communities includes not just the main content of green community construction, but also the development direction of green thing management. A scientific and reasonable evaluation index system can carry the concept of green development through the whole process of community design, construction, management and service, and promote the construction of community's residential environment in a simple, moderate, green and low-carbon way, so as to continuously satisfy the people's aspirations for a better environment and a happy life. This paper adheres to the methodological guidance of historical materialism, takes spatial justice as the value dimension, and proposes an evaluation system of four criterion indicators including green building, green transportation, green management and green culture, 16 program indicators, and multiple observation indicators from the three spatial dimensions of "physics-spirit-society." Among them, green building and green transportation, which belong to physical space, serve as the material basis for green community evaluation, and as the objects of community environmental protection and low-carbon construction. With the continuous development of green communities in China, the physical space consideration of green community has made remarkable progress. In view of this, based on the ever-developing of low-carbon technology and the material foundation of the community, the consideration of green community needs to pay more attention to the innovative development of the "structure-process" of green management and the cultivation of the residents' green culture, with the help of which the green community will be transformed into a three-dimensional composite body of the "physical-spiritual-social".

Through the hierarchical analysis method, this paper analyzes and explains the specific use of indicators quantification, weights determination, and scores calculation, ultimately, the results of the evaluation are clarified in the form of scores and grades. Among them, the part of green management as the most important consideration index is consistent with the realistic requirements of the development of green community

at the present stage in China, which is based on the inheritance and development of the Marxist spatial justice thought and the precise research and judgment on the reality of the development of green community in China. Taking green management as the most important indicator of green community evaluation is not to ignore the development of green building, green transportation and green culture, but to guarantee the innovative development of planning, construction and management of green building and green transportation through the attention of green management, and also to drive the promotion of green culture and the cultivation of green lifestyle of residents through the continuous improvement of green management. In this way, it not only realizes the mutual cooperation between quantitative and qualitative evaluation, but also gives clear observation points for the qualitative indicators of green community construction in the new era, and provides a relatively feasible method for the evaluation indicators of green community construction in the new era of China, so as to create a righteous space body where "human-society-nature" can co-produce, co-prosperity, co-exist, and co-progress in a harmonious way. However, given that the green community evaluation index system constructed in this paper is a "convention number" for green community construction, and China is a vast country with different geographic environments and humanistic backgrounds, various regions need to make adjustments or supplements according to the reality of its own development in the process of green community evaluation.

Conclusions

Under the guidance of the Marxist theory of spatial justice, this study analyzes the theoretical basis and practical effects of the existing green community evaluation index system in major countries around the world. And on the basis of that theory, this study reconstructs a green community evaluation index system that meets the needs of the harmonious development of human beings and nature. The study mainly draws the following conclusions:

(1) The existing green community evaluation index systems in the world mainly focus on the greening of physical space and lack consideration of the greening of residents' lifestyles and production space, as well as analysis of socialized living space. Therefore, they are both "surface green" community evaluation systems that focus on the environmental landscape.

(2) The existing green community evaluation index systems in the world lack scientific theoretical guidance and the ideas of “residents- centered “ and fairness, which makes it difficult for these evaluation systems to achieve fair distribution of spatial resources, rational and orderly production of space and efficient governance of spatial affairs.

(3) Guided by the Marxist theory of spatial justice, an evaluation system of 4 normative indicators, 16 programmatic indicators and a number of observational indicators is proposed from the three spatial dimensions of “physical-spiritual-social”, and the specific use of the hierarchical analysis method for quantifying the indicators, determining the weights, and calculating the scores is analyzed and explained. Finally, the results of the evaluation are clarified in terms of scores and grades. The construction of the green community evaluation index system directed by spatial justice is designed and measured from the perspective of realizing spatial justice, so as to effectively safeguard the residents’ spatial rights and interests in practice, and to promote the emergence of a harmonious symbiosis pattern of “human-nature-society”.

The contributions of this study are as follows:

(1) Based on the existing green community evaluation index systems, this study constructs a set of scientific green community evaluation index system, which embodies the ecological modernization idea of harmonious coexistence of “human-nature-society” and meets the requirements of "The 2030 Agenda for Sustainable Development".

(2) This study adheres to the methodological guidance of historical materialism and constructs a green community evaluation index system that meets the needs of the times with spatial justice as the value orientation, which makes up for the lack of theoretical support of the existing green community evaluation index systems.

(3) The new evaluation index system focuses the goal of creating communities in contemporary China in six aspects, including the construction and improvement mechanism of the community’s living environment, greening of community infrastructure, livable environment for the community, community information intelligentization and the green culture of the community. The system goes beyond the traditional single-dimensional cognition of green communities and focuses on regulating the construction of green communities from the perspective of overall space.

(4) The new evaluation index system fully respects regional cultural characteristics and advocates the construction of diversified, heterogeneous green communities with Chinese characteristics under the comprehensive consideration of local cultural and locational factors.

(5) The new green community evaluation index system has both academic and practical significance, and the system has been successfully piloted in Guanlan

Street, Longhua District, Shenzhen, which provides a practical blueprint for the construction of nationwide green communities and is conducive to promoting the process of ecological modernization.

The shortcomings of this study are listed below:

(1) This study is based on research samples from Chinese cities and communities, and lacks attention to the development history and status of green communities in other countries. In the future, we will increase the sample and expand the scope of the study to further enrich and improve the green community evaluation index system.

(2) The green community evaluation index system did not appear until the end of the twentieth century, thus there is a lack of practical experience to draw on for this study. In the subsequent research, it is necessary to combine more cases to verify and improve the evaluation index system constructed in this study.

(3) This study mainly explains the leading role of the government in setting standards and implementing standards in the construction of green communities, while weakening the role of the market and public participation, which leads to the singularization of the main body of practice in building green communities.

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Conflict of Interest

The authors declare no conflict of interest.

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