

Research on Age-Friendly Renewal Design of Community Parks Based on Elderly Participatory Construction: A Case Study of Xinmenkou Community Park Renewal

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Abstract: Age-friendly design embodies a pivotal urban development endeavor in addressing the aging society during China's urban renewal era. Among the key components of this renewal process, community parks occupy a prominent position, and their adaptation to cater to the older population stands as a significant area of research and development. Drawing upon an analysis of the characteristics and requirements of the senior population, along with factors influencing their participatory construction of community parks, this study proposes methodologies for elderly-involved construction activities encompassing design, planting, maintenance, and activity participation. Capitalizing on a user-centric approach, the study targets three primary aspects—space, facilities, and activities—to proceed with an age-friendly renovation for the Xinmenkou Community Park in Gulou District, Nanjing, China. By introducing tailored zones such as a self-created space zone, a planting experience zone, a voluntary maintenance zone, and an activity participation zone, the design aims to fulfill the aspirations of older residents for the participatory construction of community parks. This innovative scheme revitalizes aging urban communities and presents a fresh perspective for urban renewal strategies.

Keywords: Community parks; Renewal design; Age-friendly; Participatory construction

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1. Introduction

China has now ushered in an aging society, prompting continuous refinement and innovation across industries in areas such as age-friendly social security and elderly care service systems ^[1-2]. In 2021, the Ministry of Housing and Urban-Rural Development initiated the first batch of urban renewal pilot projects, in a bid to explore coordinated mechanisms, methodologies, and sustainable models for urban renewal ^[3]. This endeavor

constitutes a pivotal urban development strategy in addressing the challenges of an aging population.

Community parks situated within urban old districts represent a crucial type of urban renewal. As the most accessible green spaces within residents' living vicinities, community parks are intimately intertwined with urban dwellers, particularly serving as the primary venue for elderly individuals' daily activities^[4]. These parks are intimately linked to the lives of city residents, fostering a sense of belonging, enhancing neighborhood harmony, and serving as hubs for social interactions among community members, including older adults.

Currently, most community park green spaces primarily fulfill leisure, recreation, entertainment, and fitness functions^[5]. However, there is a scarcity of approaches that embody residents' preferences and enable their active participation in their development, thereby failing to accommodate the diverse needs of modern society. Nanjing, as one of the pioneering cities in the ministry's urban renewal pilot program, has embarked on innovative renewal methodologies and mechanisms within community parks that are frequently utilized by older residents. With the objectives of enriching their leisure time and satisfying their needs, Nanjing is exploring resident-participatory approaches to developing community parks, as well as age-friendly renewal of facilities, spaces, and activities within these parks. This represents a significant research area within the broader urban renewal agenda.

2. Management model and characteristics of the target user group

The research focuses on the Xinmenkou Community Park in Gulou District, Nanjing, China. This park is open to the public and employs a professional maintenance and management model, wherein a government-commissioned landscape company oversees order maintenance, facility, and plant care, as well as park cleanliness and sanitation.

Primarily serving the permanent residents of the Xinmenkou community, this area belongs to the older urban neighborhoods, spanning approximately 0.98 square kilometers. It comprises 23 courtyards, harbors 122 buildings, and houses approximately 5,200 households, racking up over 12,000 individuals. Notably, the population of 60 years and older constitute approximately 3,000 residents, many of whom have resided in the community for over 20 years, fostering a profound sense of familiarity, belonging, and attachment to the environment.

Psychologically, aging often brings about feelings of insecurity, loss of belonging, diminished self-worth, and a heightened need for privacy among the older population^[6-7]. Consequently, most seniors yearn for care, seek opportunities to demonstrate their value, and enjoy sharing their thoughts and engaging in social activities. Rooted in China's traditional agrarian society, gardening serves as a continuation of farming culture, appealing to many seniors who find solace and self-cultivation through planting flowers and tending to plants. Additionally, gardening facilitates social interactions, expanding their circle of friends. Upholding the virtues of neighborliness, unity, and mutual assistance, engagement in the construction and management of community parks represents a means for seniors to embody their social values. As the most knowledgeable and influential voices in their communities, seniors exhibit a strong sense of belonging and identity^[6-7]. Thus, integrating participatory construction into the renewal of community parks holds significant feasibility, aligning with the evolving needs of community co-governance in contemporary China.

3. Factors influencing elderly participatory construction of community parks

Community parks primarily cater to a stable residential population within a defined area, characterized by low mobility and a high frequency of usage by seniors. Employing the “Social-Ecological Model”, researchers can analyze the influence of the community park environment on elderly individuals’ willingness to engage in its development across three dimensions: individual, social, and environmental factors ^[8-9]. Individual factors, being intrinsic, stem from the physiological and psychological characteristics of the older population. These encompass value-based and social interaction needs shaped by age, occupation, and educational level, which are intrinsically motivated by personal desires and perceived benefits. In contrast, social and environmental factors operate as external influences. Social factors encompass the sophistication of participation mechanisms, management systems, the degree of familiarity, trust, and reciprocity among users, as well as neighborhood dynamics ^[10]. Meanwhile, environmental factors refer to the quality of the community park’s surroundings and amenities, all of which collectively influence the willingness of older individuals for the participatory construction of community parks. This analysis provides a theoretical foundation for the renewal and design of community parks that foster elderly participation.

4. Analysis of modes tailored for elderly participatory construction of community parks

Community parks, being the most intimately integrated with urban residents, serve as vital outdoor public spaces for daily life ^[11]. Through the study of participatory construction approaches in community parks and the analysis of elderly needs under the age-friendly principle, four distinct modes tailored for elderly participation construction of community parks emerge: design participation, planting participation, maintenance participation, and activity participation.

Design participation involves residents, particularly seniors, participating in discussions and decision-making related to design schemes or specific spatial usage ^[12]. This mode facilitates the fulfillment of residents’ inherent demands for the space, layout, and form of the community park, thereby enhancing seniors’ sense of value and responsibility.

Planting participation refers to the provision of planting areas within the community park, where residents can collaborate in creating a communal garden through the cultivation of flowers, trees, and other greenery ^[13]. Influenced by China’s traditional farming culture, Chinese people hold a unique affection for planting. This mode not only enriches seniors’ leisure time and fulfills their self-worth needs but also fosters a sense of ownership within the community, encouraging outdoor interaction, social inclusion, and environmental integration, ultimately providing a platform for promoting harmonious communities ^[14-15].

Maintenance participation entails residents’ involvement in the post-construction upkeep of the community park, aimed at sustaining its vitality and promoting sustainable development. It includes tasks such as plant irrigation, fertilization, pruning, soil loosening, site cleaning, and park order management ^[16]. This mode can be facilitated by professional gardening companies offering technical guidance, while residents’ associations organize plant adoption or engage elderly volunteers in park maintenance ^[17-18]. Such a collaborative governance mode harnesses residents’ initiative and enthusiasm, leading to efficient operations and fostering sustainable community park development.

Activity participation encompasses exhibition- and interaction-oriented events organized by residents’ associations or spontaneously initiated by residents themselves. Regularly scheduled activities cater to the

diverse needs of older residents, enriching their leisure time, fulfilling psychological and social demands, and simultaneously enhancing community cohesion and vitality.

A collaborative mode involving government, enterprises, and communities fosters community gardens through training volunteer leaders, empowering older residents to participate fully in all four modes ^[18]. This approach realizes the sustainable development of community parks through “self-governance and self-management” in the participatory construction process (**Figure 1**).

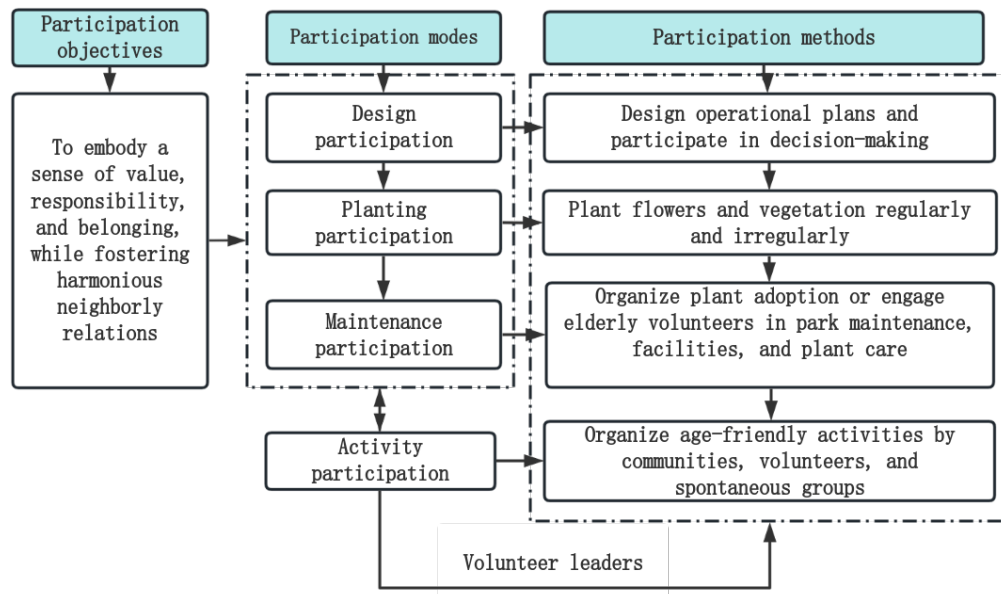


Figure 1. Modes tailored for elderly participatory construction of community parks

5. Age-friendly renewal design of the Xinmenkou Community Park in Gulou District, Nanjing, based on elderly participatory construction

5.1. Objectives of the renewal design

Embracing older people’s physiological and psychological needs as the cornerstones, this study aims to create an inclusive, participatory, eco-friendly, and educational community park tailored for seniors. This will be achieved through spatial optimization, aging-in-place facility upgrades, and the integration of diverse activities, fostering an environment that is both open and welcoming.

5.2. Objectives of the renewal design strategy

The renewal design strategy encompasses three primary aspects—space rejuvenation, facility modernization, and activity infusion—in an attempt to achieve the revitalization of the community landscape, incorporation of smart and age-friendly facilities, and rejuvenation of daily life experiences (**Figure 2**).

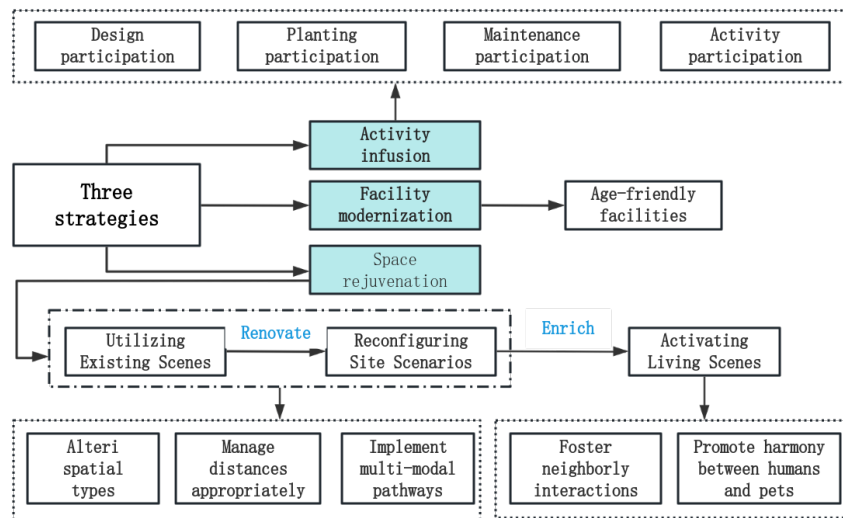


Figure 2. Renewal design strategy

5.2.1. Space rejuvenation—revitalization of the community landscape

Space rejuvenation involves leveraging, transforming, and enhancing the existing spaces through three key strategies: “Utilizing Existing Scenes”, “Reconfiguring Site Scenarios”, and “Activating Living Scenes.” By adopting these, the original site spaces are adapted, revamped, and elevated to cater to the needs of older adults. Specifically, “Reconfiguring Site Scenarios” focuses on altering spatial types, managing distances appropriately, and implementing multi-modal pathways to fulfill age-friendly requirements. Meanwhile, “Activating Living Scenes” aims to foster neighborly interactions and promote harmony between humans and pets through renewal design interventions.

5.2.2. Facility modernization—incorporation of smart and age-friendly facilities

Adapting existing facilities to cater to seniors’ daily activities and participatory construction ensures their accessibility and usability. Furthermore, the incorporation of smart technology into these facilities fosters curiosity and encourages seniors to embrace new learning opportunities, thereby invigorating their lifestyles.

5.2.3. Activity infusion—rejuvenation of daily life

To elevate the older population’s sense of value and belonging, we proceed with age-friendly design by incorporating participatory activities across four dimensions: design, planting, maintenance, and activity participation.

6. Elderly participation-based age-friendly renovation scheme

Participatory activities serve as a vital carrier for realizing the value of senior citizens. In the renovation process, the project designed the self-created space zone, planting experience zone, voluntary maintenance zone, and activity participation zone, intending to attract elderly individuals to engage in diverse activities within the community park. This approach aims to cater to both the physical and psychological needs of the older population (Figure 3).

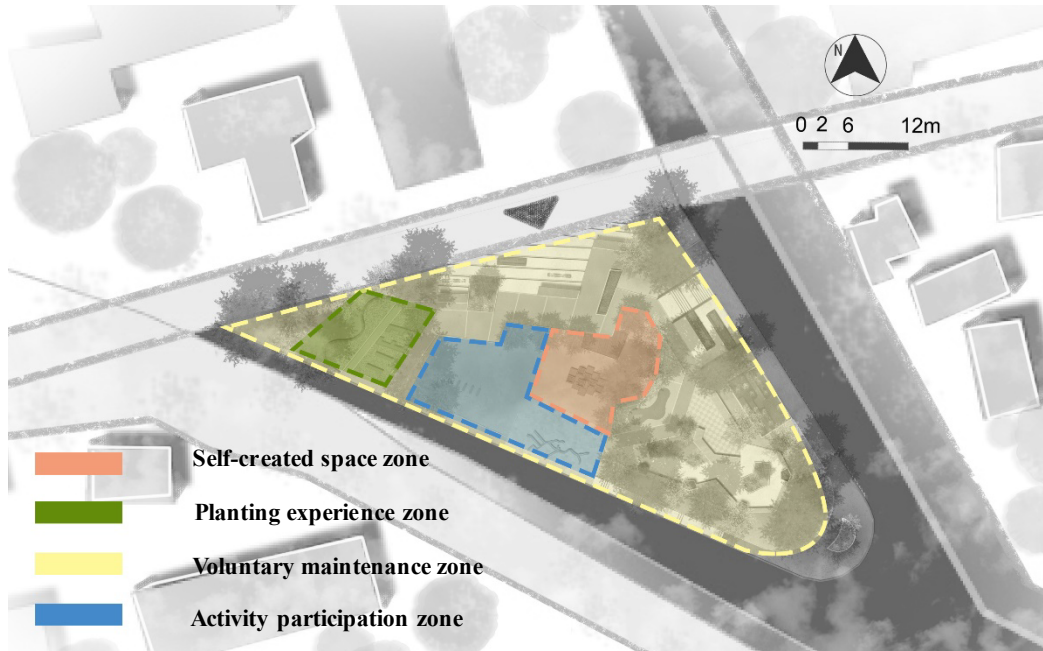


Figure 3. Zoning map for the participatory activity

6.1. Participatory design of the self-created space zone

Drawing upon the social and self-actualization needs of elderly community members, the project incorporated the design technique of “negative space” to designate a dedicated self-created space zone within the site ^[18]. This area features self-organized lounges, bird display platforms, and plant-integrated seating, fostering an environment where seniors can organize recreational activities tailored to their preferences. It fosters neighborhood interactions and empowers self-expression, providing a platform for older residents to experience a renewed sense of purpose and belonging (Figure 4).

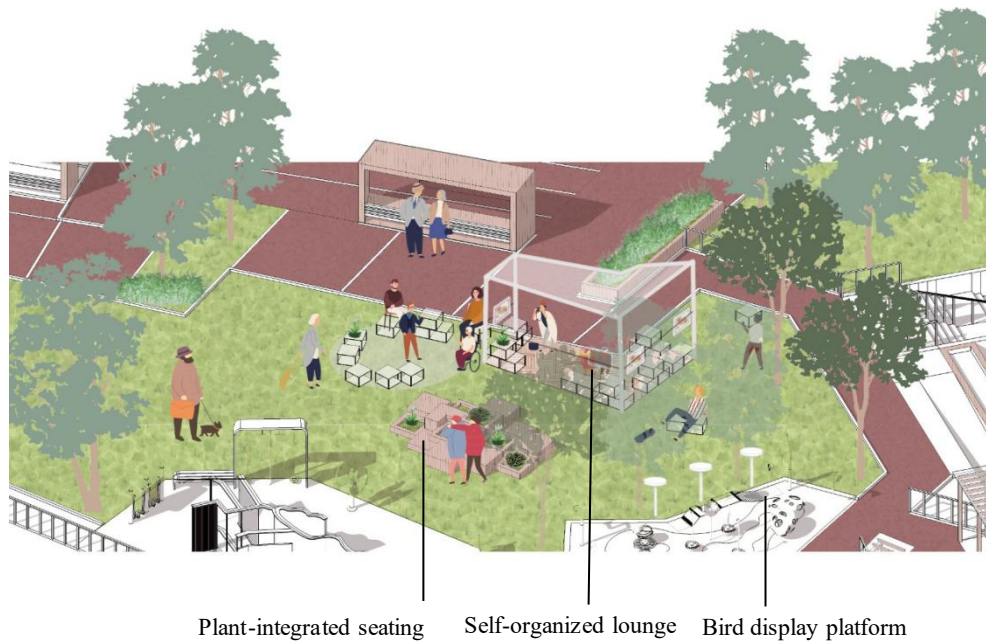


Figure 4. Rendering of the self-created space zone

6.1.1. Self-organized lounge

By installing “movable modules” within the designated space, the project empowers senior residents to arrange these elements autonomously, accommodating diverse activity needs and personal spatial preferences. This approach allows for a customized spatial design.

The “movable modules” are conveniently portable cubic blocks, each measuring 60 cm × 60 cm in length and width, and 40 cm in height, crafted from lightweight yet sturdy materials. Users define the functionality of these modules, creating versatility through vertical stacking (for display purposes), horizontal alignment (as resting benches), circular arrangements (forming activity spaces), or linear placements (as auditorium seats for senior performances).

Naturally, the potential of these movable modules extends beyond these applications, adapting to the evolving needs of residents and encouraging more active participation in park activities.

6.1.2. Bird display platform

Situated in the southeast corner of the site, adjacent to the children’s play area, the bird display platform accommodates birdcages, fulfilling seniors’ interest in bird-walking and providing a centralized venue for social gatherings. This arrangement addresses the social needs of older people, contributing positively to their mental health.

6.1.3. Plant-integrated seating

Comprising square blocks and plant containers, the plant-integrated seating offers urban dwellers residing in high-density areas a unique opportunity to engage with nature intimately. Residents take charge of planting and selecting the species within the containers, enhancing their sense of belonging to the space and increasing its controllability.

6.2. Design of the planting experience zone

Underpinned by professional companies and neighborhood committees, the planting experience zone engages older residents through adoption programs or voluntary services, enabling them to participate in the plant cultivation efforts within the community park. This designated area within the park provides the necessary space for seniors to engage in participatory planting, fulfilling their traditional agrarian desires for autonomous cultivation and maintenance. Simultaneously, the opportunity for seniors to share planting insights and interact fosters a sense of value and belonging, representing a novel approach to eldercare services ^[19]. The planting experience zone has been revamped with the introduction of “XYZ” planting boxes and a plant exchange zone, catering to the diverse planting activities of the older population (**Figure 5**).

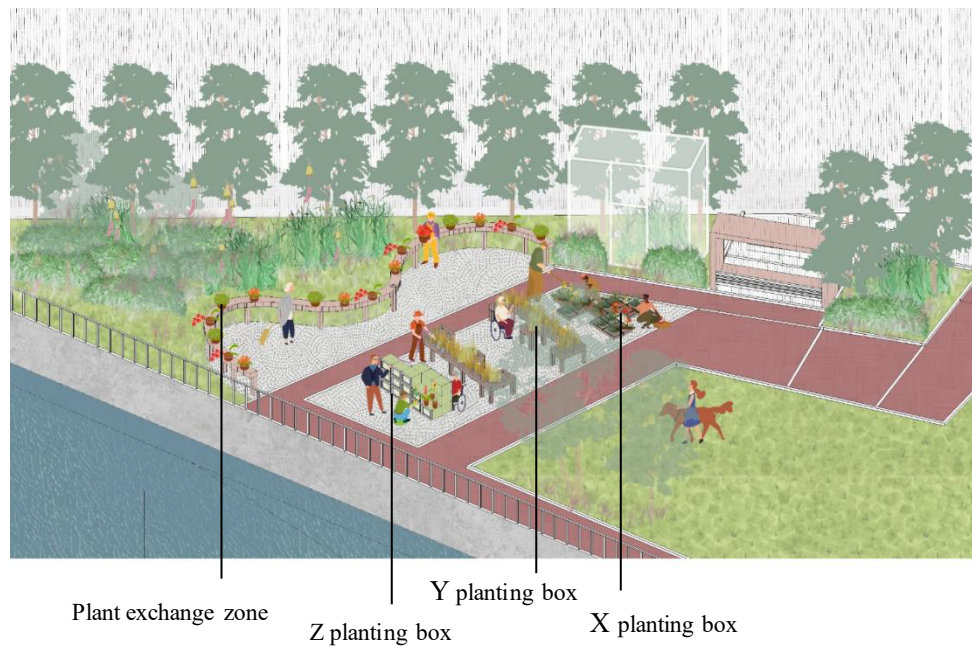


Figure 5. Rendering of the planting experience zone

6.2.1. “XYZ planting boxes”

These installations facilitate planting activities among the senior community, embracing the “age-friendly” concept while also considering the usability of wheelchair users. They not only enrich the leisure time of older adults but also invigorate the community.

The “X” planting box is a flat box suitable for physically fit elderly groups, capable of accommodating taller plant species. The “Y” planting box is a barrier-free, U-shaped planting trough designed with accessibility in mind. It features a wheelchair-accessible entryway and is height-adjusted to align with the armrests of wheelchairs, allowing for active participation of wheelchair users. The “Z” planting box is a vertical planting cabinet intended to display ornamental potted plants such as succulents.

The adoption system applies to all planting boxes, where each plant is tagged and adopted by a resident who takes responsibility for planting, nurturing, and managing it. This arrangement fosters mutual assistance and communication among residents, enhancing their sense of self-worth, community belonging, and stewardship.

6.2.2. Plant exchange zone

Located to the west of the planting boxes, the plant exchange zone is a streamlined display platform where residents can showcase their planting tips, experiences, and accomplishments. This interaction promotes harmonious neighborhood relations and harnesses plants’ ecological, aesthetic, and therapeutic benefits to enhance the landscape’s visual appeal and alleviate stress and anxiety among residents.

6.3. Design of the voluntary maintenance zone

Orchestrated by professional companies and neighborhood committees, initiatives are launched to engage the older population in various aspects of community park management, including plant care, order maintenance,

and hygiene. This collaborative effort aims to enhance the co-governance of community parks and facilitate their sustained development ^[19]. Within the park, updated designs for age-friendly maintenance facilities, such as manual water pumps and composting solariums, have been implemented to ensure accessibility and ease of use for seniors. Furthermore, the “Sunset Glow” Park Management Service Team, consisting of older volunteers from the community, can be integrated into the management of park order and hygiene. By harmoniously blending park regulations with input from residents, a comprehensive management plan is formulated, fostering a virtuous cycle of self-construction and self-management within the community park ^[19]. Thus, the voluntary maintenance zone emerges as a pivotal platform for older residents to realize their personal worth.

6.4. Design of the activity participation zone

Collaborative efforts from governments, enterprises, social organizations, and communities facilitate the development of participatory construction management systems, train community leaders, and organize the implementation and operation of participatory activities within community parks. Adhering to the process of “Participate–Learn–Communicate–Practice–Communicate”, activities are integrated throughout the entire construction phase of the park. Moreover, this plan dedicates a specialized “activity participation zone”, encompassing both organized and spontaneous activity areas. The organized area features an “interactive lecture hall”, while the spontaneous area hosts historical art installations, pet tracks, and fitness equipment. This approach enriches the lifestyles of seniors, encourages their outdoor engagement, satisfies their intellectual curiosity, bolsters self-identity, and ultimately invigorates the community (Figure 6).

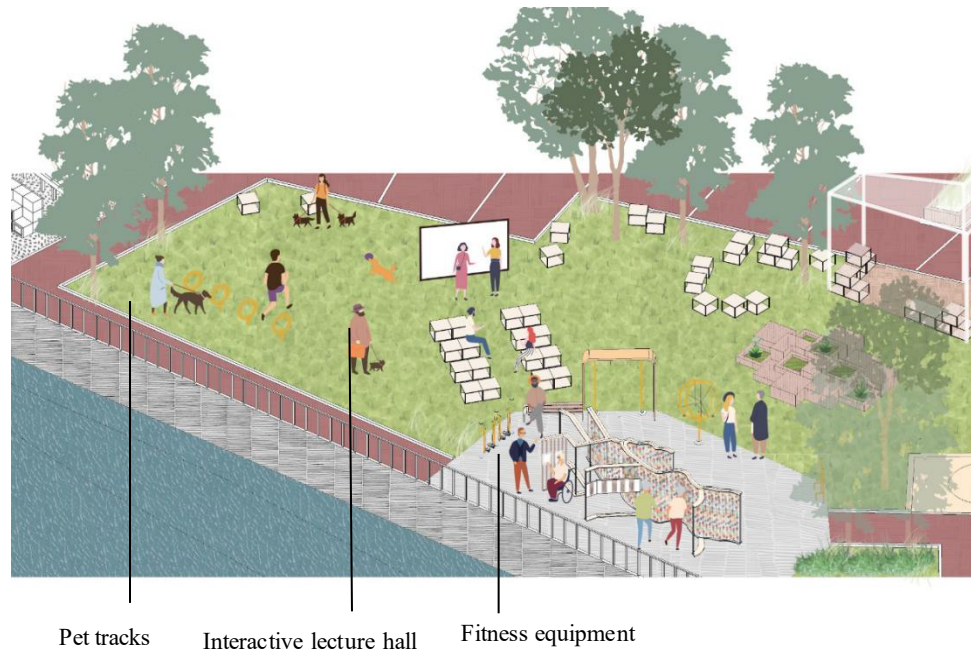


Figure 6. Rendering of the activity participation zone

6.4.1. Interactive lecture hall

Centered in the lawn area, the interactive lecture hall operates through community groups like neighborhood committees, fostering interactive participation among residents. Utilizing “movable installations” as seating, regular science lectures on diverse topics such as health, planting, photography, fraud prevention, and electrical

safety are held, stimulating seniors' interests, enriching their lives, and achieving educational goals.

6.4.2. Pet tracks

Nestled within the central lawn, pet-oriented installations encourage pet owners, particularly elderly ones, to interact, fostering a harmonious human-pet environment (**Figure 6**). Pets provide valuable companionship and therapeutic benefits to city dwellers, especially seniors. By harnessing this human-pet bond, the scene elicits tenderness within seniors, enhancing their sense of happiness and well-being.

7. Conclusion

The design of this community park's age-friendly renovation, rooted in resident-participatory construction, endeavors to cater to the needs of the older population through four key aspects: "self-created spaces, planting experiences, voluntary maintenance, and activity participation." It explores methodologies for spatial rejuvenation, facility modernization, and activity infusion, effectively fulfilling the participatory activity demands of seniors. This approach to participatory construction enhances seniors' sense of participation, autonomy, and value, serving as a vital vehicle for fostering harmonious communities in urban settings. Furthermore, the resident-participatory construction paradigm offers valuable insights for future urban renewal and renovation projects.

However, given the relatively short history of participatory design in China, its widespread adoption among the general public remains limited. Consequently, post-implementation, the organizational and practical aspects of participatory activities may inevitably encounter a range of management challenges. To address these, administrators must continually innovate mechanisms and provide institutional support for participatory construction activities^[20-21]. Additionally, regarding the "age-friendly" renovation of the park, continuous observation and follow-up studies are necessary to ascertain whether it genuinely achieves "age-friendliness" and meets the genuine needs of seniors, thereby providing a realistic basis for future age-friendly modifications.

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Disclosure statement

The authors declare no conflict of interest.

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