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Co-Creation, Co-Construction, and Co-Governance in Community Renewal: A Case Study of Civic Participation and Sustainable Mechanisms

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Abstract

This study focuses on Shanghai, a pioneer city in China's community renewal practices. In recent years, community renewal driven by civic participation has become a prominent research topic, leading to the emergence of numerous exemplary cases in Shanghai. However, field investigations revealed that many projects have experienced varying degrees of physical deterioration and a decline in spatial vitality due to insufficient maintenance, reflecting unsustainable outcomes. In response, this study examines a bottom-up community renewal project led by the research team, aiming to explore how broad civic participation can promote sustainable community renewal. A multidisciplinary approach incorporating perspectives from ecology, the humanities, economics, and sociology was used to guide citizen participation, while participatory observation methods recorded emotional shifts and maintenance behavior throughout the process. The results showed that civic participatory actions under the guidance of sustainability principles effectively enhanced citizens' sense of community identity and responsibility, thereby facilitating the sustainable upkeep and operation of community spaces. However, the study also found that bottom-up efforts alone are insufficient. Sustainable community renewal also requires top-down policy support and institutional safeguards. At the end, the paper concludes by summarizing the practical outcomes and proposing strategies and mechanisms for broader application, aiming to provide a reference for related practices and research.

Keywords: sustainability; community renewal; civic participation; community gardens; co-creation; co-construction; co-governance

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1. Introduction

With the rapid advancement of the economy and large-scale urbanization, central areas of large and medium-sized cities have virtually no room left for new construction. As the fundamental unit of urban composition, communities have evolved in parallel with the broader trajectory of urban development [1]. However, as living standards continue to rise, communities are increasingly confronted with the dual pressures of limited spatial resources and the growing gap between residents' expectations for quality of life and the actual conditions of their living environments. In response, local governments across countries have introduced a series of community renewal policies aimed at combining top-down and bottom-up approaches to encourage public participation in reshaping aesthetically pleasing and vibrant community spaces. Driven by these policies, urban renewal efforts in many countries have gradually shifted from a period of large-scale demolition and reconstruction to a more refined, stock-based development model [2].

As China's largest economic and trade center, Shanghai is a high-density, compact international metropolis, with an average population density exceeding 3000 people per square kilometer [3]. The continuous influx of migrant populations has intensified the tension between population growth and limited land resources, resulting in highly compressed residential space and a severe shortage of per capita green space in public areas. Against this backdrop, how to optimize landscape quality and improve spatial functionality within limited community space has become a central concern for both the Shanghai municipal government and urban researchers. In 2016, Shanghai took the lead in launching the Walking Shanghai–Community Micro-Renewal Program [4], which adopted micro-intervention strategies to improve the spatial quality of aging communities, enhance visual appeal, and increase spatial efficiency in response to the pressures brought about by spatial constraints. This initiative explicitly addressed the need to repurpose small-scale, fragmented, and abandoned spaces within communities. At the same time, the Shanghai government also recognized the importance of civic participation in the process of community renewal and began promoting mechanisms that encourage civic participation. As a result, supported by relevant policies and guided by various organizations, Shanghai has in recent years witnessed the emergence of diverse forms of community renewal. These include the creation of community gardens and community living rooms, the painting of community murals, and the organization of community art events and so on. Such developments have positioned Shanghai as a pioneer in the field of community renewal in China. However, successful community renewal requires not only diversity in form but also sustainable mechanisms for long-term maintenance and support. Taking the community garden, a common feature in Shanghai's renewal practices, as an example, over 2000 community gardens of various types have been constructed across different districts in recent years. These gardens exhibit a wide range of organizational models and thematic expressions, reflecting the city's rich and diverse cultural identity. Nonetheless, field research indicates that many of these gardens encounter a range of practical problems after their completion, including plant withering, excessive weed growth, damaged facilities, and a general decline in spatial vitality.

Therefore, the objective of the present research is to explore how broad civic participation can address a range of unsustainable outcomes in community renewal. It focuses on three core research questions:

(1) How do we achieve the sustainable renewal of the community through a model of broad civic participation and community self-governance?

(2) Can civic participation in community renewal initiatives enhance residents' sense of identification with their community and their sense of responsibility for its maintenance?

(3) What concrete strategies and mechanisms can support the sustainable renewal of the community through civic participation?

In response to these questions, this study conducted a case analysis based on a bottom-up community garden project led by the research team. Throughout the project, the research team coordinated the joint participation of multiple stakeholders in the construction process. Under the guidance of sustainability principles, the project examined sustainable community renewal through ecological, cultural, economic, and social lenses. During the implementation phase, participatory observation methods were used to document the co-creation and co-construction processes involving residents, children, and multiple stakeholders. This approach allowed for close observation of participants' emotional and behavioral changes throughout the participation process, as well as continuous monitoring of maintenance behaviors in the late stages of the project. The results demonstrate that, under the guidance of sustainability principles, community renewal activities that encourage broad civic participation can, to some extent, promote the sustainable operation of

community spaces. These activities also enhance residents' sense of identification with their communities and increase their enthusiasm for participation. However, the long-term and healthy development of public community spaces still requires top-down policy guidance and more robust institutional safeguards. Finally, based on the project experience, this study summarizes a set of sustainable strategies and mechanisms that are applicable for broader implementation.

From a practical standpoint, this study provides low-cost, replicable, and bottom-up community renewal strategies for other cities facing spatial constraints and limited resources. It proposes top-down management mechanisms and offers recommendations for community policymakers, organizations, and practitioners to improve community governance structures. It also summarizes the mobilization pathways of citizens with diverse identities and details the renewal procedures, offering guidance for multi-stakeholder governance and the formation of bottom-up community renewal teams.

From a theoretical perspective, first, this study integrates the core concepts of sustainable development and participatory community planning to construct a conceptual framework of civic participation in sustainable community renewal, encompassing multidimensional collaborative governance across ecological, social, economic, and spiritual–cultural dimensions. Second, it extends the commonly recognized dimensions of sustainable renewal by adding the spiritual–cultural sustainability dimension, emphasizing the role of soft governance, such as identity recognition, collective belonging, and cultural continuity, in community renewal. Third, the study explores the integration of civic participation with ecological design and long-term maintenance. Existing research on strategic and institutional mechanisms primarily focuses on broader themes such as community social network building [5–8] and participatory governance [9–11]. Few studies have constructed a sustainable renewal framework from a multidimensional perspective, and sustained observation of post-renewal community space maintenance remains limited. This research, therefore, addresses the gap in understanding civic participation within the full-spectrum and full-process renewal of communities.

2. Literature Review

2.1. Core Concepts

2.1.1. Community Renewal

Community renewal originated in the 1950s in the United States in response to the need for post-war urban revitalization [12]. It gradually developed in the United Kingdom during the 1960s to address urban decline and social segregation [13]. In the contemporary context, community renewal primarily emerges in the context of urban development, shifting toward population planning and community adaptation to aging demographics. It encompasses both strategic planning of physical space and the cultivation of social infrastructure [14]. The overarching goal is to improve the community environment by integrating urban regeneration strategies with community governance, thereby guiding development toward a more systematic and enduring trajectory [15].

2.1.2. Participatory Community Renewal

Participatory community renewal emerged in the 1960s and 1970s as a response to academic critiques of the lack of democracy in traditional renewal models [16,17]. In 1969, Sherry Arnstein distinguished different forms of municipal participation in her work *A Ladder of Citizen Participation*, highlighting the insufficient degree of participation in urban planning at the time [18], which laid the foundation for participatory approaches in community building. This approach aims to improve community spaces through small-scale construction activities carried out collaboratively by individuals across different social

strata, identities, and roles within the community [19]. It promotes a shift in community renewal from a top-down model to one based on co-governance and sharing, emphasizing the role of citizens in enhancing community vitality and cohesion, while also serving as a key process through which civic identity is shaped [20]. As Habermas argued in *Communicative Reason*, the transition in community renewal from elite dominance to broad social participation shifts the focus from planning outcomes to the coordination of social relations [21,22].

2.1.3. Civic Participation in Sustainable Community Renewal

Sustainable community renewal derives from the concept of sustainable development proposed in the 1987 United Nations report Our Common Future [23]. It emphasizes the coordinated development of economic, social, and environmental dimensions within communities, representing an extension beyond traditional approaches focused solely on physical space improvement. Defined as a progressive approach integrating environmental protection, social equity, and economic vitality [24], it is result-oriented and aims to activate internal community assets, enable pluralistic governance, thereby fostering a renewal path that ensures community stability and development in both the present and the future [25,26].

The concept of civic participation in sustainable community renewal emphasized in this study builds upon the foundation of sustainable community renewal by reinforcing the practical value of public involvement in long-term maintenance. It is an integrative framework that combines key features of traditional community renewal, sustainable development, and participatory community planning [27]. In the face of challenges such as aging infrastructure, limited spatial resources, weakened social cohesion, and insufficient community capacity, single-dimensional interventions are inadequate for ensuring long-term development, and unilateral governance is often unable to address the complexities of community life. Therefore, this concept aims to highlight the role of civic engagement in driving integrated processes by incorporating strategies such as ecological restoration, participatory mechanisms, financial coordination, and policy support to foster multi-stakeholder collaboration and enhance community resilience. Compared to participatory community renewal, both emphasize civic participation but differ in origin, goals, methods, and depth of participation. The former treats participation as the goal, focusing on fairness and democracy. Civic participation in sustainable community renewal sees participation as a means to address community issues and promote long-term development through multidimensional coordination. It not only emphasizes ecological improvement and infrastructure optimization but also incorporates long-term dimensions such as social equity, cultural continuity, and economic resilience [28,29]. It further highlights the synergistic effects generated by the deep participation of diverse social groups throughout the process [30], making it a common approach in recent years of community research and practice.

2.2. Practice Review

Systematic community practices characterized by broad civic participation began in Japan in the 1960s with the emergence of community design, which later developed into the concept of community building (Machizukuri). Following the post-war phase of community planning, Japan began encouraging civic involvement in community renewal initiatives in the 1980s [31]. The Arima Fuji Park renewal project in Hyogo Prefecture, led by the team of Ryo Yamazaki, engaged residents in design and rule-making through workshops. This approach fostered both active and voluntary participation in ongoing maintenance. The spatial transformation thus also became a process of reconstructing

social relations and cultivating community self-governance [32].In contrast, since the 1990s, community renewal in the United States has placed greater emphasis on cultural expression and identity construction, as a response to the ethnic exclusion and spatial deprivation caused by traditional renewal approaches [33]. The Mission District Cultural Action, launched in San Francisco in 1995, used artistic practices to stimulate participation and cultural identity among marginalized groups [34], highlighting the role of the new genre of public art in community revitalization [35]. During the same period, the United Kingdom emphasized the integration of ecological protection and social equity into community renewal, promoting a resident-led path toward sustainable development [36]. For example, the BedZED project in London demonstrated a shift from physical transformation to integrated development involving people, the environment, and institutions through energy-efficient design and co-management by residents [37].

Participatory community practices emerged relatively late in China. In recent years, the focus has been on the parallel development of civic participation and micro-renewal. These practices have arisen in response to the scarcity of high-density urban space, emphasizing the encouragement of civic involvement through small-scale, incremental, and everyday interventions targeting micro-community spaces [38,39]. The earliest reference to resident participation in decision-making and implementation appeared in 1989, during Wu Liangyong's organic renewal project in Ju'er Hutong, Beijing. After 2014, a series of small-scale projects promoting resident participation began to appear. In 2015, the team led by Liu Yuelai gradually gained experience after facing initial challenges such as resident resistance and frequent loss of materials. They eventually established the first publicly participatory community garden in an open block in Shanghai, Chuangzhi Farm, which became a representative case of civic participation in community renewal. Since then, many cities across the country have promoted sustainable renewal concepts grounded in co-creation, co-construction, co-governance, and shared benefits, encouraging civic participation and enhancing community vitality. As a result, civic participation in community renewal has become a growing research focus, with increasing attention in recent years.

A review of relevant cases indicates that many countries have shifted from traditional community renewal toward approaches centered on civic participation and sustainable development, offering valuable references for community practices in China. China first began to make scattered attempts in high-density cities. However, because related practices and research are still at an early stage, a number of challenges remain. These include the absence of long-term operational mechanisms and a reliance on organizing entities or government agencies, which continues to hinder autonomous governance. Therefore, it is necessary to further explore how a multidimensional sustainability framework can support the development of a renewal mechanism that covers the entire process. In addition to strengthening social relations, the potential of broad civic participation to promote sustainability in ecological, cultural, spiritual, and economic dimensions also requires closer examination. This addresses existing gaps in the establishment of long-term operational mechanisms for community spaces and in understanding the role of civic participation throughout the renewal process.

3. Materials and Methods

3.1. Method

This study is a case study based on the front-yard renovation project of the No. 580 community in Yangpu District, Shanghai, which was initiated and led by the research team. It aimed to examine how long-term sustainable renewal of community space could be achieved through a bottom-up model of civic participation and to summarize corresponding strategies and mechanisms. The project was also used to test whether

citizens' sense of community identity and responsibility could be enhanced through actual participation.

Before the project began, a multidisciplinary approach was adopted to review relevant literature and analyze comparable cases. The review indicated that sustainable community renewal involves factors such as natural ecology, economic development, social systems, cultural advancement, and the political environment. Grounded in the concept of sustainability [40,41], the research approaches community renewal through four key dimensions: ecological, economic, social, and an expanded dimension of spiritual–cultural sustainability. This additional dimension aims to preserve and co-create shared values, collective memory, and community identity through participatory cultural practices (Figure 1).

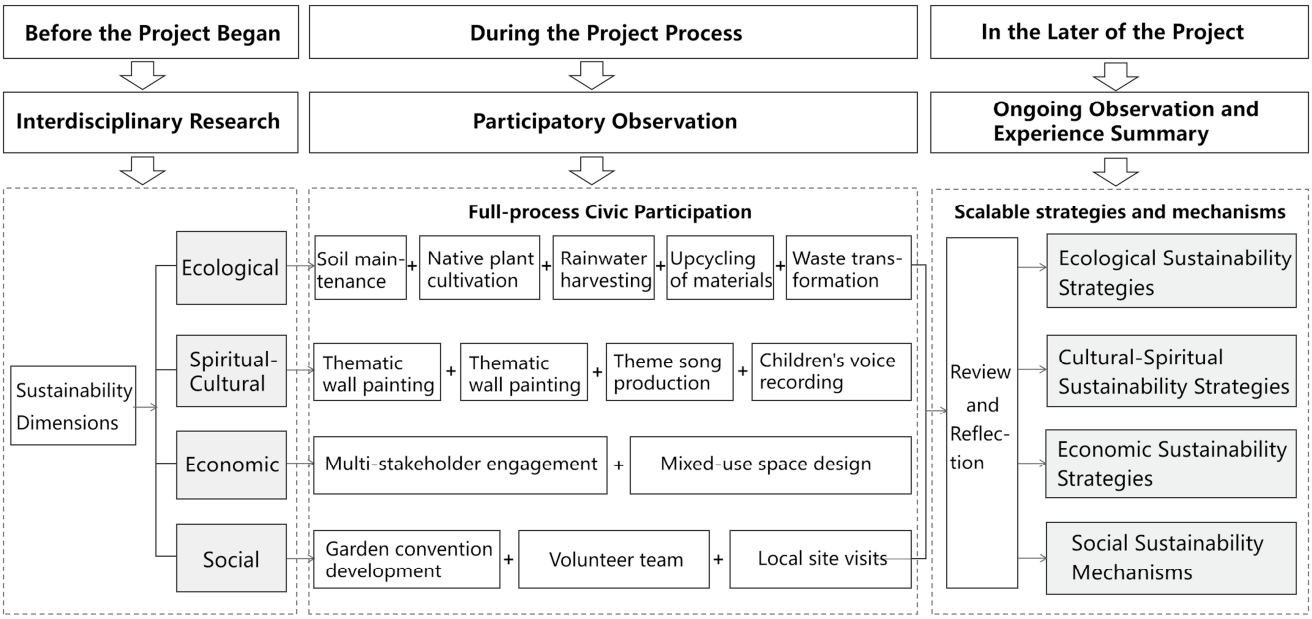


Figure 1. Research methodology framework.

During the project process, participatory observation methods were employed to observe participants' emotions, behaviors, and attitudes. The research team members participated as both participants and observers. Participatory observation originates from early 20th-century research in social anthropology and sociology. It was first applied in Bronisław Malinowski's fieldwork in the Trobriand Islands [42]. The method was later formalized by Lindeman (1924), who categorized observers in social science research as either objective observers or participant observers [43]. Participatory observation refers to the researcher immersing themselves in a specific social setting or group to observe participants' behaviors, interactions, and practices [44]. This approach allows the researcher to uncover implicit or hidden information that cannot be accessed through external interviews alone. It is particularly valuable for research aimed at understanding the lived experiences of individuals or groups within specific social contexts. This method was used to assess whether, under the guidance of sustainability principles, promoting broad-based civic participation in co-creation and co-construction could enhance residents' sense of identification with the community, increase their enthusiasm for participation, and revitalize the space, ultimately contributing to the sustainable development of community environments

In the later stages of the project, continued attention was paid to the post-construction maintenance of the community garden in order to assess both its sustainability and the challenges that emerged. The relationship between participants' frequency of activity and the condition of garden maintenance was monitored to evaluate how the level of civic engagement influenced the outcomes of community renewal. Based on observations

from the project process and the resulting findings, the study concludes by summarizing practical insights and proposing strategies and mechanisms that may serve as references for future community renewal initiatives.

3.2. Site Description

This community renewal project was conducted in Shanghai, China. As the first city in the country to implement community micro-renewal practices, Shanghai has accumulated extensive experience in promoting bottom-up civic self-governance and has garnered considerable popular support. The site was a small green space located at the entrance of the Friendly Neighbors Gate (Figure 2), in front of Lane 580 in Yangpu District. The Friendly Neighbors Gate is a small symbolic gate opened in the shared wall between an old residential compound at Lane 580 in Yangpu District, Shanghai, and the newly developed Chuangzhi Fang community, representing neighborly friendliness and community integration. Its opening enabled full access to surrounding public service resources, reduced service delivery costs, and became a representative case of open community development. The neighborhood surrounding the Friendly Neighbors Gate was among the earliest sites in Shanghai to carry out community renewal experiments. Residents in the area have accumulated practical experience in community building and have actively participated in relevant initiatives, which contributed to the effective implementation of this project.



Figure 2. Photo of the Friendly Neighbors Gate.

The project focused on the utilization of micro-scale spaces within the community. The selected site covered an area of approximately 20 m^2. The surrounding area benefits from convenient transportation, a diverse commercial landscape, and the presence of two kindergartens nearby (Figure 3). Prior to the renewal, the site featured a monotonous plant landscape with exposed bare soil, poor visual appeal, and was inaccessible to residents. Based on feedback collected from local residents, the renewal aimed to enhance the site's visual aesthetics, increase plant diversity, and serve an informational and communicative function for the community.

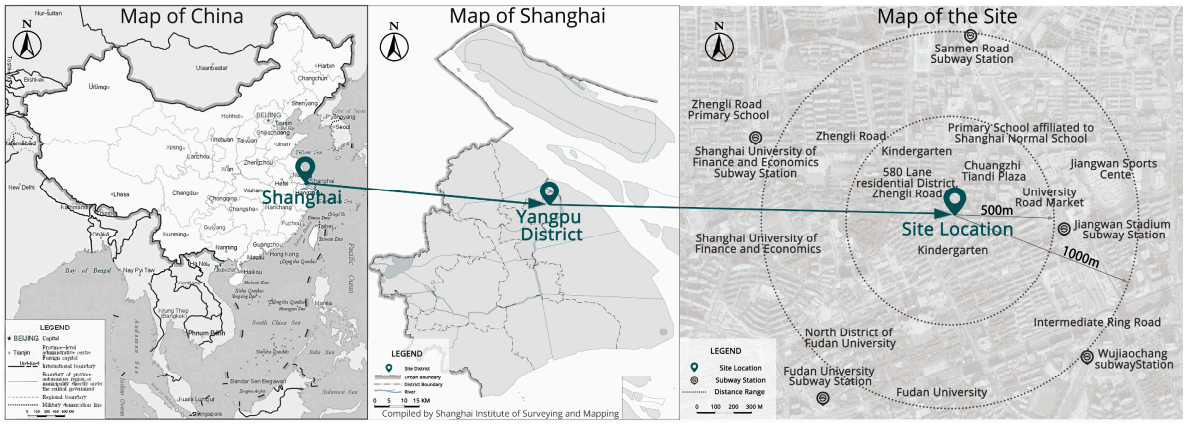


Figure 3. Site location and surrounding situation map.

4. Practice Process

Before the project began, site research was conducted, relevant stakeholders such as the community committee, residents, volunteers, and other interested parties were contacted and recruited, and a renewal team was established. Multiple stakeholders were brought together to participate in the decision-making process, with an intentional effort to diminish the dominance of the professional team and to transfer decision-making power to all participants. Through a series of co-creation meetings and material collection initiatives, the process sought to strengthen participants' sense of involvement and responsibility. During the co-construction phase, the organizing team focused on guiding the process according to the core design objectives and the four dimensions of sustainability, while allowing the final outcome of the site construction to be shaped by the participants themselves. Meanwhile, participants and long-term volunteers were recruited through multiple channels during the co-creation and co-construction stages to lay the foundation for ongoing maintenance (Figure 4).

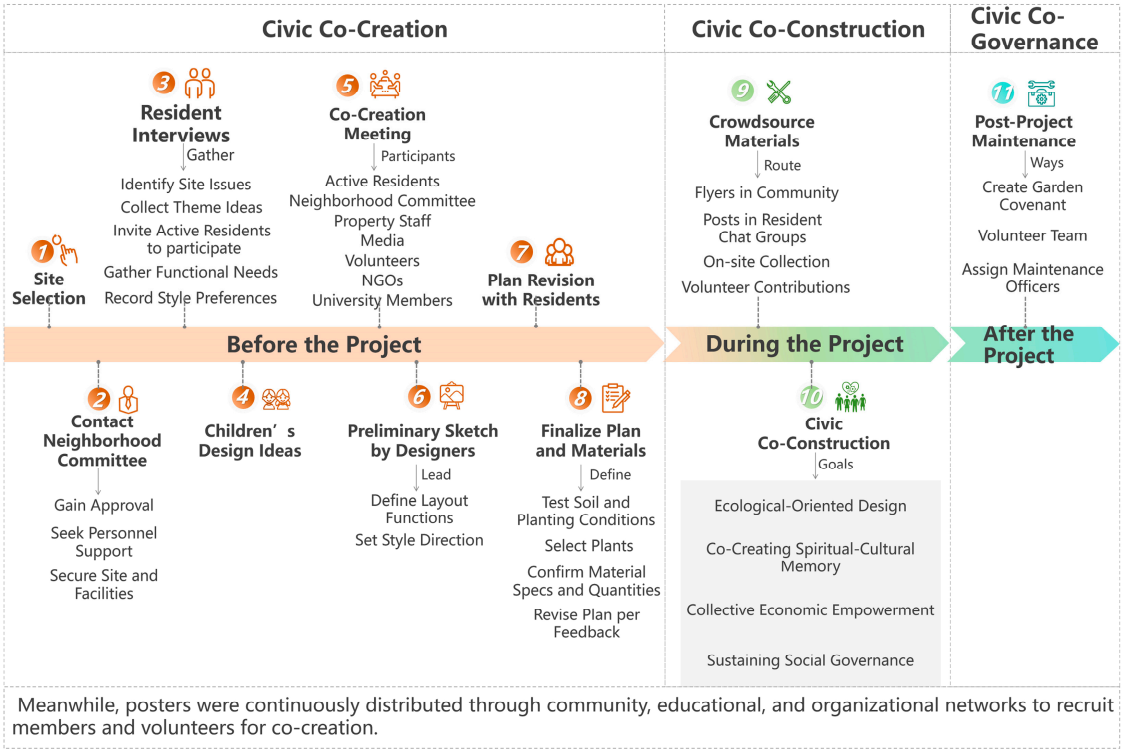


Figure 4. Project process diagram.

4.1. Ecological-Oriented Design

The project adopted an ecological design approach, focusing on the creation of the physical space through soil restoration (Figure 5), the planting of native vegetation, rainwater collection, and the reuse of discarded materials (Figure 6). The process began with pH testing of the original soil, followed by composting and the incorporation of nutrient-rich soil. Native plant species that were well-suited to the site conditions were selected to reduce long-term maintenance costs. At the same time, the ecological characteristics of the plants were fully utilized; for instance, ophiopogon japonicus, a water-loving species, was planted in elevated areas to naturally absorb rainwater runoff, avoiding the need for impermeable hardscape materials and restoring the natural water cycle on site. In addition, all artistic installations and rainwater collection devices within the site were made from discarded or recycled materials. These elements followed the principles of waste reduction, reuse, and recyclability, laying an ecological foundation for the site's long-term sustainable development. By applying ecological design concepts within the context of a micro-scale community space, the site underwent a comprehensive transformation in both appearance and function (Figure 7).



Figure 5. Plant removal and soil composting on site.



Figure 6. Upcycling of discarded materials.

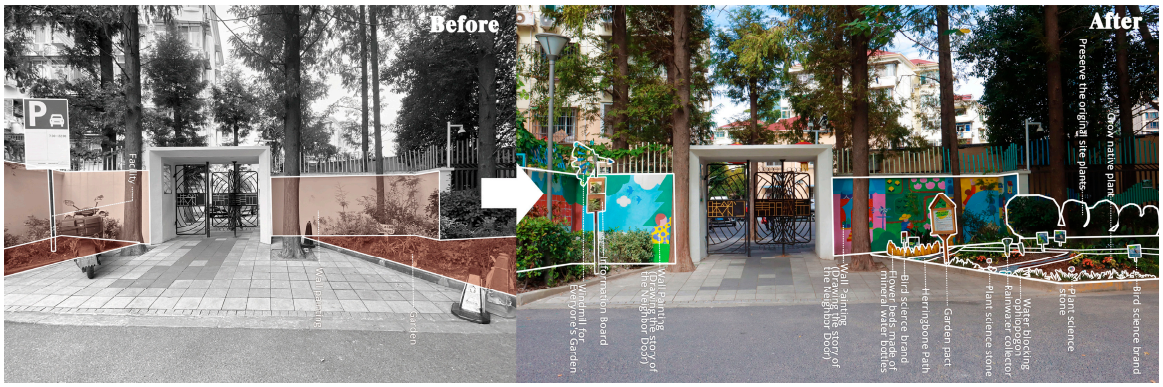


Figure 7. Before-and-after comparison of the site.

4.2. Co-Creating Spiritual–Cultural Memory

This project adhered to the principle of broad civic participation, emphasizing the empowerment of residents, volunteers, and diverse community groups. Through processes of co-creation and co-construction, it aimed to promote both spatial and cultural renewal. During implementation, the research team actively invited teachers and children from nearby kindergartens to participate in the design and production of plant science signs and the creation of community murals (Figures 8 and 9). The team also supported the children in recording audio guides for plant knowledge dissemination (Figure 10). By turning children's recordings into QR codes and combining them with plant images to create display plaques, basic scientific knowledge is integrated into daily life in an engaging and publicly accessible form, serving as part of children's foundational science learning. At the same time, elderly residents from the community were invited to provide suggestions on plant selection, and a retired painter contributed to the mural's creation. These intergenerational dialogues and the transmission of local knowledge helped strengthen the intersection between cultural heritage and community identity. The mural's theme was artistically reimagined based on the historical evolution of the Friendly Neighbors Gate, transforming the community's collective memory into a visual expression of local culture.



Figure 8. Teachers and children from nearby kindergartens discuss garden renewal details.



Figure 9. Children, parents and teachers collaboratively painting murals and educational cobblestones.



Figure 10. Educational plant signage with children's audio recordings (QR code scannable).

As the project progressed, community members gradually shifted from passive participants to active cultural producers. Resident volunteers actively proposed naming the garden, hoping it would have an identity of its own. It was eventually named "Everyone's Garden" to reflect the spirit of collective participation and co-creation. An enthusiastic resident composed a theme song for the garden and organized local children to record it together. Elderly residents voluntarily wrote poems for the garden, and student volunteers who participated in the co-creation documented their experience in diaries. Through music, literature, and other creative forms, residents collaboratively constructed and preserved the community's shared cultural memory. This process not only demonstrated the localized and public nature of cultural production but also laid the foundation for building a spiritually connected and resident-centered cultural community.

4.3. Collective Economic Empowerment

From an economic perspective, this community renewal considered both multi-stakeholder participation and diversified commercial models. First, it brought together a wide range of stakeholders, including neighborhood committees, residents, property management teams, volunteers, designers, university faculty and students, media, and social organizations, to engage in co-creation and co-construction (Figures 11 and 12).

Materials required during the renewal process were partially donated by the co-creators, while some were provided by property managers, nearby schools, and residents. Certain plants were acquired through a resource-exchange mechanism with community members, and the remaining supplies were funded by social organizations (Table 1). The involvement of multiple stakeholders helped to ease financial burdens while integrating diverse identities and resources, ultimately providing the community with broader forms of support and assurance.

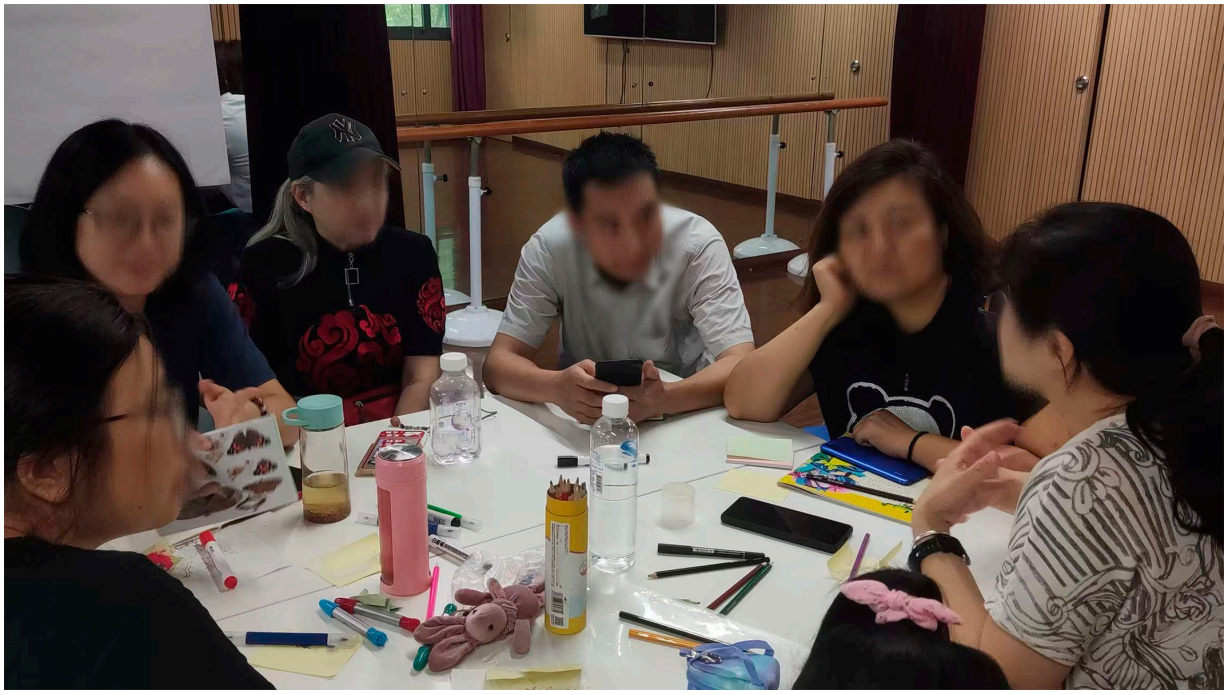


Figure 11. Multiple stakeholders jointly discussing renewal strategies for the site.

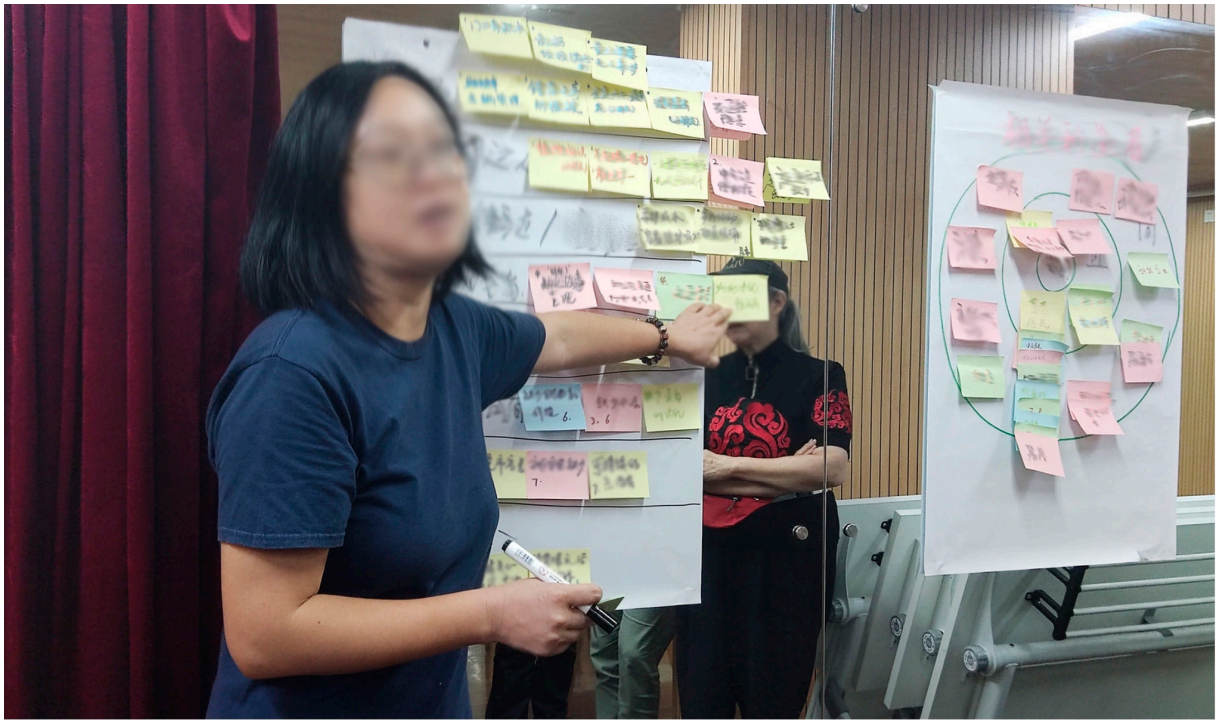


Figure 12. A photo of team members discussing the proposal on-site.

Table 1. Material list and expenditure details during the renewal process.

Category	Item	Quantity	Cost (CNY)	Acquisition Method
Tools	Shovels, spades, hot melt gun	Several	0	Borrowed from social organization and kindergarten
	Nails, hammers, electric drill, electric screwdriver	Several	0	Borrowed from property management
Materials	Crushed gravel	150 kg	300	Provided by property management, sponsored by volunteers
	Cobblestones	25 pcs	0	Provided by property management
	Used beverage bottles	Several	0	Provided by property management and children
	Discarded wooden boards	Several	0	Provided by property management
	Wall paint and painting tools	Several	84	Purchased by self and donated by residents
	Decorative ceramic pots	2	0	Donated by residents
	Spray paint, wood preservative	4	65	Purchased
	Lawn lights	4	72	
	Rainwater infiltration tools	10	8	
	Acrylic panels	2	30	
	Children's science signs	8	40	
	Iron wire	10 m	30	
	Information board	1	0	Donated by the kindergarten
Plants	Tree bark	2 bags	0	Provided by property management
	Begonia cucullata	7	0	Replanted from the original site
	Euonymus japonicus, *Euonymus grandiflorus*	Several	0	
	Photinia	6	0	
	Ligustrum	Several	0	
	Pittosporum tobira	2	0	
	Coleus blumei	6	0	
	Asparagus setaceus	1	0	
	Aspidistra elatior Blume	8	0	
	Vinca major	Several	0	
	Aucuba japonica	Several	0	
	Sansevieria trifasciata	2	0	Exchanged with residents
	Monstera deliciosa	1	0	
	Ilex spp.	Several	0	Donated by volunteers
	Kalanchoe blossfeldiana	20	0	Donated by a social organization
	Ophiopogon japonicus	Several		
	Pteris vittata	Several	0	
	Nephrolepis cordifolia	Several	0	
	Rhododendron spp.	4	0	
Total			629	

In terms of diversified commercial design, the project capitalized on Shanghai's open-minded urban culture and dynamic atmosphere to establish cooperative relationships with surrounding businesses. These partnerships facilitated mutual promotion by offering commercial actors access to on-site publicity space, thereby enhancing visibility for both parties. Taking advantage of the site's strategic location, the project was linked with vibrant adjacent streets to host community exhibitions, publicity campaigns, and information-sharing activities. Moreover, leveraging the close relationship with the Friendly Neighbors Gate community center, the team collaborated with government departments and social organizations to organize a community visit. These activities served as grassroots publicity platforms for community renewal and helped generate sustained economic benefits from multiple sources.

4.4. Sustaining Social Governance

In the later stages of the project, the project team explored sustainable maintenance strategies from the perspectives of social institutions and public governance, aiming to ensure the long-term continuity of community co-construction outcomes. First, a community garden covenant was established to regulate the behavior of passersby, maintain order in daily use, and reinforce both residents' and visitors' awareness of responsibility and norms regarding shared spaces.

Second, a post-maintenance team was formed, composed of local residents and volunteers. A duty schedule and clear division of responsibilities were established to support collaborative and self-organized maintenance at the institutional level. This mechanism proved effective during the early phase of implementation. Specifically, the volunteer team was able to carry out routine maintenance and safety inspections at short intervals, which helped preserve the garden's cleanliness and functionality. However, long-term observations revealed that relying solely on a rotating volunteer force was insufficient to support high-frequency, continuous maintenance. This highlighted the need to introduce more stable management personnel or institutionalized operational mechanisms, facilitating continuous maintenance.

In addition, the project team intentionally integrated the garden into local tours, exhibitions, and public cultural activities, thereby transforming it from a small green space in front of residents' homes into a public display platform with communicative cultural value. This strategy not only enhanced the garden's public visibility and external attention but also activated residents' sense of care for public resources through a mechanism of social supervision. As a result, it provided support for the site's autonomous and sustainable operation.

5. Results

5.1. Analysis of Participants

5.1.1. Participant Proportion

A total of 139 individuals participated in the project. Among them, residents, volunteers, and organized groups of children and students from kindergartens and primary or secondary schools formed the core participants, accounting for 74.11% of the total. In terms of age distribution, individuals under the age of 18 and those aged 41–50 constituted the majority, making up 56.11% of participants (Table 2). This pattern is often attributed to the tendency of parents to bring their children to such community activities in hopes of enhancing their children's experience with social practice and civic awareness. Participation among young adults aged 19–30 was relatively low. This is likely due to the public nature of community activities, which offer limited personal gain and demand private time, making such initiatives less appealing to this age group. However, the renewal and devel-

opment of communities often rely on the energy and creativity of young people. Based on these findings, future community renewal efforts may consider several approaches to enhance sustainability: increasing child-oriented programs to attract parents and educators; expanding the scope of elder-support initiatives; cultivating a youth-friendly community environment to encourage the involvement of young adults.

Table 2. Summary of the proportion of participants.

Items	Index	Frequency	Percentage	Cumulative Percentage
Age	Under 18	46	33.09	33.09
	19–25	11	7.90	40.99
	26–30	8	5.76	46.75
	31–40	25	17.99	64.74
	41–50	32	23.02	87.76
	51–60	9	6.48	94.24
	Above 60	8	5.76	100.00
Identity	Residents within the community	25	17.99	17.99
	Nearby residents	8	5.76	23.75
	Community service staff	12	8.63	32.38
	University faculty and students	8	5.76	38.14
	Designers	4	2.88	41.02
	Volunteers	24	17.27	58.29
	Kindergarten children and primary/secondary school students	46	33.09	91.38
	Members of social organizations	10	7.19	98.57
	Company employees	2	1.43	100.00
Gender	Male	50	35.97	35.97
	Female	89	64.03	100.00
Total		139	100.00	100.00

5.1.2. Participant Composition at Different Stages

Through the observation of participants across different stages of the project, it was found that levels of engagement varied significantly among different age groups and identity categories (Table 3). During the initial co-creation phase, participation was primarily concentrated among community residents, volunteers, and members of social organizations aged 31 to 50, with occasional involvement from a few older, enthusiastic residents. Participation at this stage was mainly driven by neighbor-to-neighbor engagement and individual initiative. The 31–50 age group generally demonstrated strong communication, organizational, and empathetic abilities, making them a key target for early recruitment. In addition, older residents tended to have a deeper understanding of the community and neighbor relations, along with more flexible schedules. With referrals from community committees, they could serve as catalysts within the initial team, encouraging nearby residents to engage through localized interactions.

In the mid-stage co-construction phase, in addition to community residents, volunteers, and social organizations, participation expanded to include organized groups of primary and secondary school students, as well as young children accompanied by families. Some local residents also participated temporarily after being drawn in by the co-construction activities. This stage was characterized by a combination of group-based participation organized through families and schools, and on-site recruitment of local passersby. Compared to the earlier stage, the mid-stage saw an increase in underage participants involved through family or school groups, as well as temporary local participants, alongside a relatively stable core team from the initial phase.

In the post-stage maintenance phase, participants were mainly older community residents, members of social organizations, and maintenance staff, primarily aged between 41–50 and over 60. This stage was marked by the involvement of social organizations, coordination by community committees, and individual maintenance efforts. These participants generally showed a strong sense of responsibility and long-term engagement in community affairs, making them the core force in site maintenance and a key group to involve during the post-construction phase.

Table 3. Key Participant Groups at Different Stages.

Category	Initial Stage (Co-Creation)	Middle Stage (Co-Construction)	Post Stage (Co-Governance)
Participant Roles	Residents, volunteers, designers, university students, NGO	Volunteers, residents, children, primary and secondary school students, property managers, designers, NGO	Residents, NGO, neighborhood committees, property managers
Age	41–50; 31–40	Under 18; 41–50; 31–40	Over 60; 41–50; 31–40
Group Affiliation	Individuals, neighborhood-based	Families, schools, neighborhood-based	Social organizations, community service teams, individuals, schools

This analysis provides concrete evidence for personnel integration across the early, middle, and later stages of bottom-up community renewal projects. By identifying the characteristics of key participant groups at each stage, targeted strategies for organization and engagement can be developed to ensure sustained human support. This enables a closed-loop participation model, transitioning from initial localized mobilization to multi-party coordination in the mid-stage and, finally, to ongoing maintenance.

5.1.3. Value Characteristics of Different Groups

According to the frequency of contributions made by participants (Figure 13), community members, including neighborhood committees, residents, and property management units, mainly provided site access, funding, and labor support. This highlights their fundamental role in mobilizing internal resources and advancing project implementation. Public participants, such as university researchers, designers, media professionals, volunteers, and primary and secondary school teachers and students, contributed design concepts, expert advice, service support, and promotional outreach. These contributions provided knowledge and communication resources, such as maintenance expertise, planting conditions, and renewal strategies, that enhanced both the project's technical quality and public visibility. Commercial actors, including businesses and social organizations, supported the renewal through material contributions, co-creation efforts, and experience sharing, serving as an important complement through cross-sector collaboration. These contributions spanned both tangible and intangible forms of value, underscoring the advantages of a multi-stakeholder collaborative governance model.

5.2. Analysis of Behavioral and Emotional Changes Among Participants

5.2.1. Changes in Participant Emotions and Motivation

Observations of participants' emotional and motivational changes during the project (Table 4) indicate that repeated involvement in community co-creation and co-construction activities led participants to develop a spontaneous sense of care for the site and fostered friendlier interactions among members. When inclusive participation and indi-

vidual empowerment were encouraged, participants showed higher levels of initiative and enthusiasm.

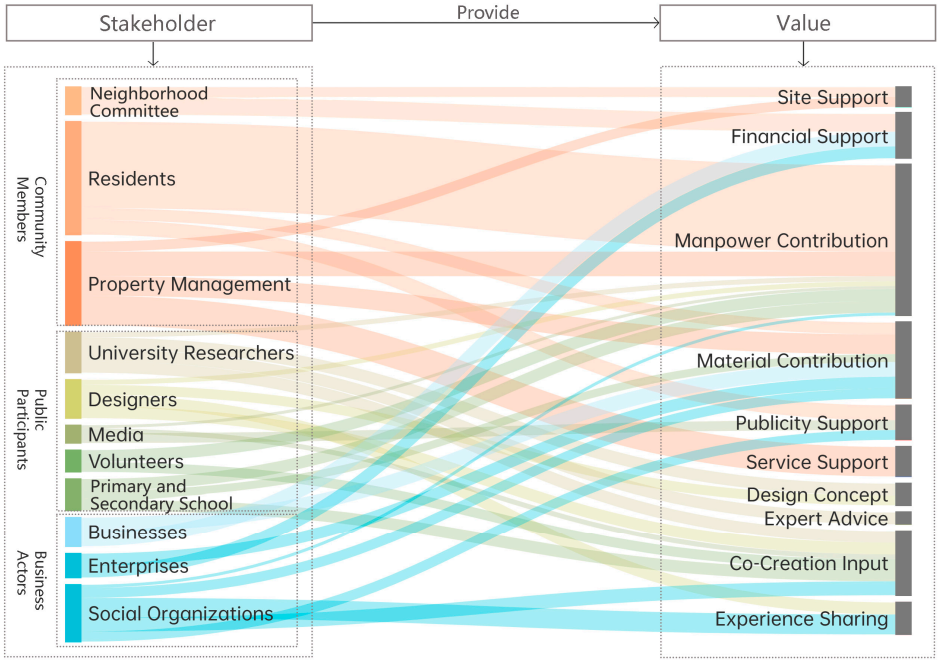


Figure 13. The actual value provided by stakeholders during the project.

Table 4. Observation summary of key participant activities.

Status	No.	Participation Content	Emotional Change	
			Before Participation	After Participation
Community Resident (A)	A1	Participated in the whole process	Actively engaged	Feels proud and gratified, and actively explains the garden's construction process and design concepts to passersby
	A2	Installation design and creation	Invited to create an art installation	Frequently introduces the art installations created
	A3	Wall painting, soil renovation	Somewhat indifferent, only accompanied the child for mural painting	Often asks if help is needed and spontaneously composes a children's song for the garden, gathering community children to record it
	A4	Assisted in wall painting design	Somewhat indifferent	Actively guides children in mural painting
	A5	Painted murals	Shy and curious	Immediately comes after school to paint murals and stones, and makes several good friends
	A6	Participated in co-creation	Apathetic	Proactively brings unused household items for upcycling
Community Service Staff (B)	B7	Provision of tools	Provided materials only, did not participate in discussions or co-creation	Actively contributes ideas for garden construction
	B8	Provided tools and materials, assisted in facility creation	Passive, uneasy	Helps with all facilities and actively searches for reusable materials

Table 4. *Cont.*

Status	No.	Participation Content	Emotional Change	
			Before Participation	**After Participation**
Nearby Resident (C)	C9	Maintenance of facilities and site	Curious but did not participate	Actively manages improperly parked bicycles near the garden and maintains the site
	C10	Created educational boards for plants and animals	Moderately enthusiastic, with average involvement	Regularly organizes kindergarten children from nearby to water the garden and clean up trash
Volunteer (D)	D11	Fully participated, leading coordination	Felt pressured and unsure of success	Feels both delighted and worried, like watching a child grow up, and is eager to ensure proper maintenance of the garden
	D12	Fully involved in design planning and co-creation	Actively participated	Fully participated and sponsored some materials
	D13	Designed and painted murals	Actively participated	Comes every day
	D14	Painted murals, participated in garden co-creation	Curious	Feels a strong sense of accomplishment and records it in a diary
College Student (E)	E15	Fully engaged in design planning and co-creation	Fairly active	Actively participates and applies the experience to other practical projects
	E16	Frequently participated in design planning and co-creation	Generally active	Actively participates and meticulously documents the co-creation experience and outcomes.
Social organization personnel (F)	F17	Planted and maintained garden plants	Almost fully involved	Very attentive to the garden's maintenance, frequently waters and fertilizes, and relocates dying plants to more fertile soil, replanting them after they revive
Journalist (G)	G18	Documented the co-creation process	Only documented the co-creation process with a camera	Participates in garden construction with two sons and produced a free documentary on the community garden

The diagram of emotional changes among primary participants (Figure 14) visually illustrates the emotional shifts before and after participation. Longer lines represent greater changes in emotional dimensions, while shorter lines indicate smaller changes. The direction of the arrows shows the direction of emotional change, and a higher position of the post-participation point reflects a higher level of motivation. The diagram shows that community renewal activities had a relatively small emotional impact on volunteers who were already highly engaged before participation. In contrast, the emotional impact was more significant among community residents and service personnel. Their attitudes shifted from initial indifference to active involvement in offering help and suggestions, accompanied by a gradual increase in the number of participants. This clearly reflects an overall rise in motivation.

This phenomenon suggests that many community members initially adopt a bystander attitude, often believing the project is "not my business." However, whether through active

or passive participation, once they engage even once, they tend to develop a positive emotional connection to the space. This sense of emotional attachment further enhances their sense of responsibility for the community space, laying a foundation for continued participation and the building of community relationships. These findings demonstrate that offering low-barrier participation opportunities and appropriate incentive mechanisms can effectively foster residents' emotional identification.

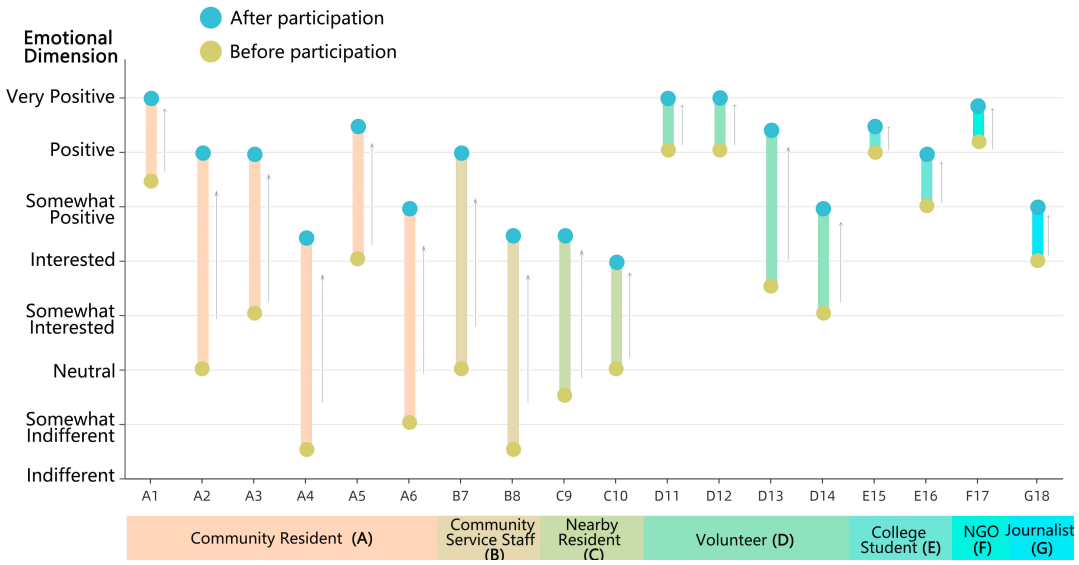


Figure 14. Diagram of emotional dimension changes among primary participants.

5.2.2. Identity Recognition Among Participants

Field observations revealed that residents who participated in community co-construction showed higher levels of site recognition and evaluation, as well as a stronger sense of responsibility for maintenance, compared to those who did not participate. This suggests that participation not only strengthened residents' emotional connection to the space but also enhanced their self-identification with the community.

According to the social identity theory proposed by Henri Tajfel and others, individuals of different ages and social roles tend to develop a sense of self-identity through the formation of group belonging when participating in shared activities [45]. Community activities can function both as a site where identity is formed and as a medium that reinforces it. When residents engage in such activities, the experience of being seen and needed can foster a sense of self-worth. This sense of self then becomes projected onto the community environment, generating a subjective feeling of "I am part of this community." This strengthens collective bonds among residents, enhances social interaction, and contributes to the formation of community identity.

Participant feedback confirmed this dynamic:

- Participant 1: "I just feel the garden looks great no matter what—probably because I helped build it. I still come by often to water the plants and clean up a bit."
- Participant 2: "My daughter helped paint the mural. Every time we pass by, she proudly tells others she helped paint this. If there's another activity like this, I'll definitely bring her again."
- Participant 3: "I often ask people passing by, 'Do you think our garden looks nice?' They always say it's beautiful, much better than before. That makes me feel proud and happy."

However, further analysis showed variation in participation behaviors among different groups (Table 5), indicating that identity recognition forms through different path-

ways. Family groups primarily build group identity through parent–child collaboration. Middle-aged individuals tend to develop value-based identity through self-expression. Adolescents often form social identity via school-based groups, while older adults achieve identity recognition through cultural memory and heritage. Recognizing these differentiated patterns can inform future community renewal design, allowing for more accurate alignment of psychological motivations and participation methods across diverse groups. This, in turn, can support a virtuous cycle of identity formation, emotional belonging, and community governance.

Table 5. Pathways of identity recognition across different groups.

Group Category	Pathways to Identity Recognition	Types of Identity Recognition	Activity Type	Observed Behavior
Family groups	Parent–child collaboration	Group Identity	Mural painting, planting	Parents and children participate together; frequent, sustained interaction
Middle-aged individuals	Self-expression	Value Identity	Design proposals, coordination, construction, idea-sharing, experience-sharing	Actively express opinions, take on tasks, work independently, communicate design intent
Adolescent students	Group belonging	Social Identity	School-organized and team projects	Higher efficiency when participating as school groups; often seek recognition or rewards
Older adults	Cultural heritage	Memory-based Identity	Storytelling, upcycling, skill-sharing	Willing to share experiences and community history

5.2.3. High-Participation Activities

During the community co-construction, the research team observed public engagement across different types of activities. It was found that activities with artistic qualities and broad accessibility, such as wall painting, plant cultivation, sound collection and recording, and the creation of art installations, generally attracted higher levels of participation. These activities were especially popular among children, families, and residents across all age groups (Table 6). In contrast, activities with strong technical requirements, such as construction or equipment installation, saw lower levels of public participation.

Table 6. Public art activities with high levels of civic participation.

No.	Activity Name	Artistic Characteristics	Mobilization Method	Primary Participant Groups
1	Wall Mural Creation	Visual arts and cultural expression	Encouraged participation	Children
2	Planting Activities	Ecological aesthetics and everyday art	Volunteer recruitment	All age groups
3	Music Recording	Sound art and resident interaction	Organized by residents	Children, parents, residents
4	Art Installation Making	Spatial aesthetics and participatory experience	Team-led facilitation	All age groups

These high-participation activities were generally organized in an open format and shared several common characteristics: (1) they were easy to access and informal in style, allowing participants to engage without high skill barriers; (2) they offered space for creativity, enabling individuals to express personal ideas and imagination, which generated

enjoyment and a sense of accomplishment; (3) they involved a high degree of interaction, facilitating interpersonal connection through collaborative processes. In such settings, residents were more likely to engage deeply and form cooperative relationships, with emotional bonds developing in the process. In particular, in parent–child and intergenerational collaboration contexts, artistic activities served not only as a medium for emotional connection but also as a trigger for identity formation.

Therefore, in community renewal practice, it is beneficial to intentionally design activities that combine artistic value, openness, and collaboration. These formats can serve as effective means to stimulate participation, enhance emotional identification, and foster a sense of belonging.

5.3. Long-Term Observations and Analysis of Sustainability

Following the conclusion of the project, a 16-month period of sustained observation was conducted, alongside a tracking study of participants' online engagement levels (Figure 15). By analyzing the site's maintenance conditions across different time periods in relation to the frequency of messages within the project's online communication group, it was found that site maintenance and online communication frequency fluctuated in parallel at multiple time nodes. During site updates or when re-maintenance occurred under the intervention of community committees or the government, participants' online activity levels increased. This indicates that community renewal actions can, to some extent, promote interaction among participants.

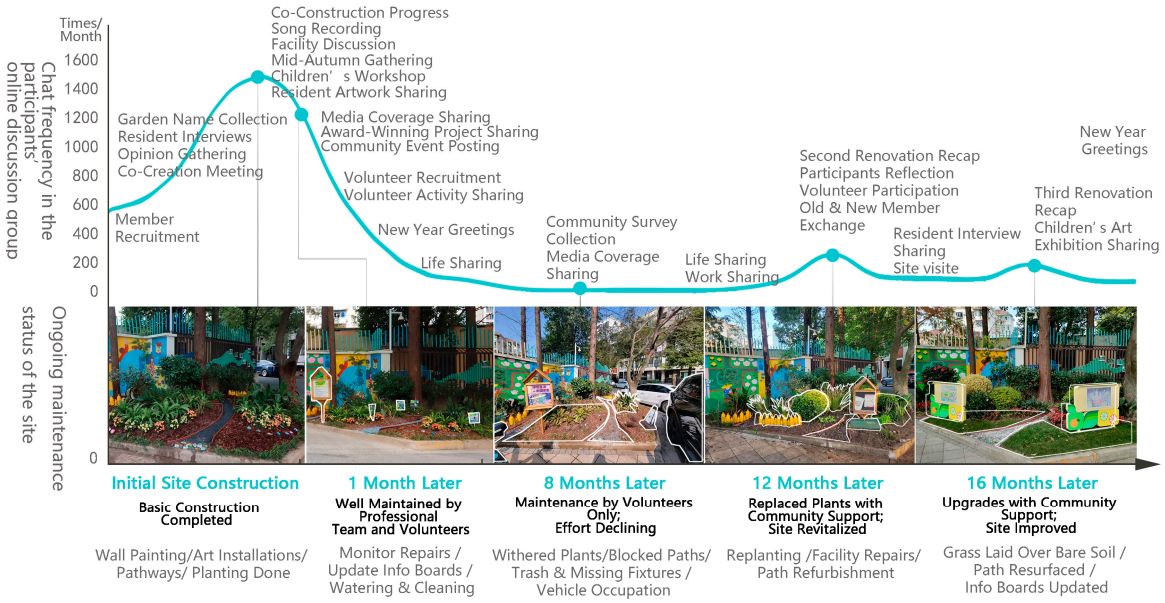


Figure 15. Long-term tracking of post-project maintenance.

The site underwent three rounds of renewal. The first took place during the initial construction phase and was led by an independent team with broad civic participation. During this phase, all participants demonstrated high levels of enthusiasm and engagement, and online activity reached its peak. In the month following the garden's completion, participant engagement declined slightly. However, thanks to continued maintenance by professional teams and volunteers, the site remained in good condition. Subsequently, as the professional team gradually withdrew and handed over maintenance responsibilities to volunteers, the garden began to deteriorate as public interest waned. The second round of renewal occurred 12 months after the garden's completion, initiated by the local neighborhood committee. This intervention revitalized discussion within the online

communication group, generating a new wave of community discourse. The third update was a partial site enhancement, again supported by the neighborhood committee. This progressive, phased approach to renewal allowed the garden to evolve incrementally. With the support of local government and social organizations, the space gradually developed the capacity for autonomous and sustainable maintenance.

These three renewal processes demonstrate that the evolution of community space exhibits phased characteristics. This feature reflects the initial lack of maintenance experience among residents, the government, and volunteers, while also highlighting the natural adaptation period required for plants and the environment to integrate. In practice, the sustainability of the space depends not only on initial enthusiasm but also on the intensity and continuity of subsequent maintenance efforts. Particularly after the gradual withdrawal of professional teams, community-led maintenance can be easily disrupted by factors such as time constraints, energy, and emotional fluctuations, leading to an unstable condition of the space. This process further emphasizes the importance of establishing a comprehensive post-renewal maintenance system and an internal self-governance mechanism within the community to ensure the stability of site operations.

Looking at the entire observation period, it is clear that while uniting various stakeholders is effective in the short term, long-term efforts cause participant enthusiasm and the maintenance capacity of volunteer teams to gradually diminish. At this point, support and intervention from local governments and community committees become particularly crucial. Thus, it is evident that community projects require not only initial infrastructure renovation but also ongoing institutional collaboration in later stages. Ensuring the long-term maintenance of the space can be achieved by integrating multiple pathways, strengthening policy guidance, providing funding support, implementing incentive measures, and assisting in the establishment of maintenance teams.

6. Discuss

6.1. Case Review and Reflection

Under the framework of civic participation in sustainable community renewal, the project demonstrated practical outcomes while also revealing several systemic challenges.

Participatory observation suggested that the project achieved a degree of sustainability. Ecologically, the use of local materials, ecological restoration, and natural cycles helped reduce maintenance labor and operational costs. In terms of participant mobilization, the project successfully engaged families, youth, and elderly residents through differentiated approaches based on psychological and identity characteristics. According to participants, this organization enhanced their sense of pride and ownership. Economically, the integration of external resources from social organizations, enterprises, and universities enabled co-construction with limited input, showing replicability and low-cost potential. Socially, mechanisms such as role rotation and the establishment of a community convention formed a preliminary framework for long-term operation and management.

At the same time, the project faced several limitations. First, in terms of renewal outcomes, the site only reached a relatively stable condition after undergoing three phases of incremental improvement, highlighting the cyclical and phased nature of site maintenance. This is closely related to the organizational stability and sustained participation of the volunteer team and also reflects the lack of a stable governance support mechanism within the community. In addition, the spatial scope of the research site placed certain constraints on the scale and diversity of resident participation. While this spatial limitation was not a major impediment, it nevertheless underscores the importance of developing future action strategies that extend beyond the immediate site. Furthermore, residents' capacity for self-organization and agenda-setting was not fully activated, and the project

remained reliant on facilitation from the research team and local organizations. These issues reflect the current insufficiency of policy support, financial assistance, personnel allocation, and participatory awareness. A more comprehensive framework is needed to support collaborative governance.

Compared with similar community renewal projects in China, such as the Chuangzhi Urban Farm in Shanghai [46], which encourages citizen-led proposals, the Anshansi Community Garden [11], where resident co-creation led to long-term community activities, the Xinqingyayuan Community [26], which shifted from developer control to owner-led management to safeguard rights and improve service quality, and the Shapowei Community in Xiamen [47], which gathered residents' input through participatory planning workshops, this project also adopted a participatory approach. However, its distinct feature lies in its foundation within a sustainable community framework, offering a more comprehensive and multidimensional renewal model. It is also an embedded, full-process practical observation that focuses more on analyzing and interpreting the process rather than solely focusing on outcomes. The research team was involved throughout the project, from the preparation stage of recruiting participants and forming co-creation and co-construction teams, to gaining a detailed understanding of personnel integration. This provides a substantive supplement to understanding organizational logic, motivations for participation, and collaboration mechanisms in community renewal. Overall, while there remains room for improvement in achieving comprehensive long-term self-governance, the project met its expected outcomes in terms of reaching phased objectives and broad-based mobilization. Based on the experience of this project, we summarize the following lessons and insights:

- Experience in Mobilizing Diverse Stakeholders: The core team should include 1–2 middle-aged members (aged 35–50) with organizational and communication skills to handle external coordination and participant recruitment. Active community residents are essential; the involvement of 2–3 such individuals can effectively enhance neighborhood attention and participation. Our core team comprised two such residents, one member from a social organization familiar with community work, two coordinators responsible for recruitment, two volunteers, and two university researchers, forming a comprehensive and efficient collaborative team.
- Experience in Securing Funding and Materials: The project secured funds and materials through various channels, including volunteer donations, support from social organizations, allocations from the community maintenance fund, corporate sponsorships based on mutual benefit, and research funding from universities.
- Experience in Organizing Community Activities: For bottom-up renewal projects, a gradual approach is recommended. Dividing the project into phases allows participants to see tangible progress and gain a sense of achievement. Setting overly ambitious long-term goals in a single phase may lead to fatigue, frustration, and withdrawal due to a lack of visible results. During this period, participant turnover is normal and can even inject new energy, creativity, and momentum into the project.
- Lessons from Planting and Maintenance: When planning ecological improvements or planting vegetation, it is important to select locations with sufficient sunlight and rain, or with accessible water sources to facilitate maintenance. Native species should be prioritized to match soil conditions. Large-leaved plants are preferable to flowering species, as they require less maintenance.
- Site Limitations: Bottom-up community renewal efforts often take place in small-scale spaces, where limited size may restrict the implementation of certain activities. In such cases, the site can function as a communication hub or demonstration space, extending its influence beyond physical boundaries. Alternatively, selecting a larger or more gatherable site at the outset may unlock greater community potential.

The case process and outcomes indicate that, compared with conventional participatory renewal models, civic participation in sustainable community renewal offers stronger integrative potential and practical traction. As urban development enters a new phase characterized by stock-based renewal, ecological transition, and community governance, traditional participatory approaches show limitations in addressing complex local challenges. In this context, this concept of sustainable civic participation gains relevance by emphasizing not only inclusiveness and democratic participation, but also ecological restoration, cultural production, economic operation, and long-term governance mechanisms. It moves beyond the notion that participation is sufficient in itself, redefining the community as an integrated system encompassing ecological, cultural, spiritual, social, and economic dimensions. Civic participation in sustainable renewal thus extends the pathway of participatory models and represents an exploratory process that combines practical experience with theoretical innovation. It offers a multidimensional analytical framework for researchers and a more applicable operational model for practitioners.

6.2. Strategy Promotion and Mechanism Optimization

In response to the effective practices and practical limitations observed in the case, it is necessary to build on existing experience and further develop actionable and transferable strategies and mechanisms. These strategies aim to offer practical guidance on how to achieve sustainable renewal of fragmented small-scale community spaces, particularly under conditions of limited human and material resources.

6.2.1. Ecological Sustainability Strategies for Shaping Physical Space

Ecological sustainability of the physical space serves as the foundation for community renewal efforts. Three key strategies are proposed as follows.

First, help residents build a comprehensive understanding of ecological systems. Before renewal begins, planting workshops, ecological education, and public outreach can guide residents to identify native plants and materials, follow principles of locality, and improve plant survival rates and landscape quality. Promote the 4R principles of ecological design (reduce, reuse, recycle, and regenerate) to encourage ecological cycles. Residents should be encouraged to adopt natural processes to reduce manual maintenance, such as rainwater harvesting, worm towers, soil restoration, and organic waste reuse, in order to create low-maintenance ecosystems.

Second, establish designated collection points for reusable materials. These are set up in-community stations for used items or donations, with clear categories of accepted materials and assigned personnel for sorting to facilitate access and reuse by residents.

Third, provide guidance on the selection of sustainable materials. Emphasizing commonly available items such as plastic bottles, yarn, clothing, and wooden boards encourages residents to repurpose everyday materials creatively. In addition, choosing durable and wind-resistant materials, such as tires and ceramics, can reduce the frequency of replacement and minimize resource consumption and waste generation.

6.2.2. Spiritual–Cultural Sustainability Strategies Through Broad Civic Participation

The sustainable development of cultural and spiritual identity relies on well-structured participation pathways and the strengthening of community identity, which can be advanced through the following strategies aimed at fostering inclusive civic participation.

First, establish effective mobilization strategies. In the early stage, community committees, property management offices, and influential residents can help form initial teams through localized demonstrations and neighbor-to-neighbor outreach, with a focus on engaging middle-aged adults (31–50) and older residents. In the mid-stage, a home–school–community collaboration mechanism can integrate renewal activities into parent–child

education and school practice. On-site interaction points can also be set up to involve temporary residents and broaden project impact. In the later stage, a volunteer-based maintenance mechanism should be established with support from community committees and the project team. This can be reinforced through point systems and public recognition, while schools, social organizations, and local businesses can help build an external support network.

Second, identity recognition across different groups can be activated through customized participation pathways. For example, parent–child families may engage in creative activities such as painting, planting, and crafting. Individual residents can build a sense of belonging through discussion, sharing, and communication. Teenagers may increase initiative through school-based organizations and recognition programs, while older residents can contribute through upcycling, storytelling, and local cultural activities. Group-specific engagement can gradually foster a sense of ownership among diverse participants, providing lasting momentum for emotional cohesion and the sustainable development of community culture.

6.2.3. Multi-Stakeholder Governance and Strategies for Economic Sustainability

Achieving sustainable economic development in communities requires the coordination of diverse resources, optimization of cost structures, and expansion of mixed-use models. The following strategies are proposed to promote the economic sustainability of the community:

First, coordinate resources to optimize costs. Responsibilities should be clearly defined, with the community committee overseeing coordination and ensuring access to space, personnel, and basic support. Resource-wise, mechanisms such as crowdfunding, engagement of skilled residents, material donations, and third-party sponsorship can help alleviate financial and labor pressures. During the maintenance phase, standardized procedures and cost accounting templates can be established, supported by dynamic evaluations and public budgeting, to optimize resource allocation and reduce professional procurement costs. Government subsidies and social capital should be leveraged to promote multi-stakeholder collaboration and ensure efficient and stable operations.

Second, expand diversified spatial uses. In terms of spatial operations, essential functions should be preserved. For instance, agricultural planting areas can be restored and integrated with aromatic and ornamental foliage plants to create edible landscapes that combine ecological, aesthetic, and economic value. The introduction of diverse commercial and social activities should also be encouraged. Drawing on local culture and policy resources, partnerships with businesses, universities, and schools can support co-branding, themed events, and experiential programs, enhancing spatial vibrancy and interaction. To overcome site limitations, the space can serve as a communication platform, while activities may extend beyond the immediate site through external venues or partner support, improving resource efficiency and increasing community returns.

6.2.4. Promoting Social Sustainability Through Maintenance and Safeguard Mechanisms

The mechanisms for strengthening social sustainability through maintenance and safeguards are as follows.

First, establish top-down institutional support. Dedicated community roles, such as planners, renewal coordinators, and management teams, should be created to oversee daily decision-making and project advancement. These positions should provide context-specific implementation proposals to improve policy support and administrative efficiency. Special funding should be allocated with a dual focus on incentives and subsidies: rewarding active contributions from residents and organizations while supporting collaborative ini-

tiatives such as university competitions and community projects. A multi-stakeholder co-governance platform should be built to integrate resources from businesses, students, volunteers, and civil organizations, enabling regular consultation and flexible coordination to enhance community self-governance.

Second, develop bottom-up self-organization models. By regularly providing public spaces and platforms, residents are empowered to independently initiate activities, reinforcing their agency, decision-making capacity, and sense of ownership in the renewal process. Incentive mechanisms should be designed, combined with clearly defined cooperative participation, to enhance residents' sense of agency and their sense of belonging to the community. At the same time, promoting resource sharing and role-based empowerment can stimulate everyday interactions among community members, further enhancing their active participation, cohesion, and collective identity.

Third, implement flexible participation and maintenance mechanisms. Schools, local businesses, residents, and volunteers should be encouraged to form spontaneous teams and engage in routine maintenance through interest-based responsibilities and rotational collaboration. On the basis of broad consultation, a community convention can be developed to promote voluntary care, building a co-managed and open system that enables self-regulation and autonomous operation.

7. Conclusions

This study is a case-based investigation of participatory community renewal guided by the concept of sustainability. The case was primarily led by the research team, which mobilized multiple forces and resources to construct a recyclable renewal system while minimizing government financial input. On this basis, the study adopted the framework of "civic participation in sustainable community renewal" and integrated the concept of sustainable development into participatory practices, aiming to explore long-term renewal pathways for community spaces across four dimensions: ecological, spiritual–cultural, economic, and social.

The study mainly employed participatory observation methods, analyzing from three aspects: participant composition, behavioral and emotional changes, and long-term observation. The results on participant composition show that minors and family-based participants accounted for the highest proportion. Different types of participants were drawn to different stages of the project, and people of different identities played various roles within the team. In terms of behavior and emotions, the renewal process had a relatively small emotional impact on those who actively participated from the beginning, but a greater emotional influence on those who were initially indifferent but gradually became involved during the process. Residents who participated in co-construction had higher recognition and evaluation of the site than those who did not, and they showed a stronger sense of responsibility for site maintenance. Activities with artistic value and universal accessibility were generally welcomed by all age groups and showed higher levels of participation. Follow-up observation revealed that the status of site maintenance and the frequency of online communication fluctuated in parallel at several time points and that the involvement of community committees and other institutions played a significant role in reactivating the site. In addition, relying solely on short-term enthusiasm from participants was insufficient to sustain long-term development, and further institutional support was required. Therefore, effective renewal depends not only on early stage mobilization, but also on the establishment of post-renewal support mechanisms and the cultivation of self-organizing systems.

At the level of strategies and mechanisms, the study summarizes four types of pathways: (1) in terms of ecological sustainability, it is recommended to create low-maintenance

and highly resilient natural systems through ecological knowledge dissemination, the establishment of material sorting points, and the optimization of material usage. (2) In the spiritual–cultural dimension, by identifying psychological characteristics of different groups and designing appropriate activities, participants' sense of identity and community belonging can be enhanced. (3) In the economic dimension, the strategy combines the introduction of diverse economic models with cost optimization to achieve a low-cost and recyclable operation model. (4) In the area of social governance, the study emphasizes the construction of a compound mechanism that integrates top-down policy support, bottom-up organizational mobilization, and voluntary maintenance, in order to promote the institutionalization of co-construction and co-governance in the community.

In general, current community renewal has gradually entered a governance stage that emphasizes both institutional coordination and relational negotiation. The pathway of civic participation in sustainable community renewal, through the multidimensional integration of ecological embedding, mechanism construction, and relational networks, provides replicable strategies and mechanisms to address the problems of insufficient maintenance and declining participation following renewal efforts. It offers a reference and practical model for community governance and spatial transformation in the context of urban stock renewal.

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