

Designing Age-Friendly Healing Landscapes for Rural Left-Behind Elderly in China

Xiayu Zhang¹, Jie Ren^{1,*}, Jian Yao², Huiyu Zhang¹

¹ College of Design & Innovation, Guilin University of Electronic Technology, Beihai 536000, China

² The Central School of Wushipu Township, Yingshang 236200, Fuyang, China

Abstract

With the rapid progress of urbanization and the intensification of population aging in China, rural areas are increasingly experiencing the phenomenon of "hollowing-out," characterized by the outflow of young labor forces. Improving the quality of life and residential environments for left-behind elderly has become a key objective in the construction of a *Beautiful Countryside*. This study examines the living conditions of left-behind elderly from the perspectives of national policies, economic circumstances, and physical and mental health. It explores the relationship between new rural construction and the left-behind elderly while proposing a mutual-aid elderly care model based on healing landscapes. The research reveals that left-behind elderly in rural areas face significant challenges, including limited economic resources, underdeveloped elderly care environments, and serious physical and mental health issues. Drawing on the theory of healing landscapes, this study proposes a multi-dimensional and hierarchical design framework that optimizes the coexistence of productive, residential, and ecological spaces. The framework aims to invigorate elderly care facilities, encourage mutual aid and self-care behaviors among the elderly, and improve their quality of life. Ultimately, the study seeks to provide a healthy and joyful living environment for left-behind elderly while advancing the goals of *Beautiful Countryside* development.

Keywords

Healing Landscapes; Left-behind Elderly; Mutual-aid Elderly Care; Beautiful Countryside.

1. Introduction

According to the *Seventh National Population Census Bulletin (No. 5)*, as of 2023, the elderly population aged 60 and above in China has reached 297 million, accounting for 21.1% of the total population, with those aged 65 and above comprising 15.4%^[1]. This marks China's transition into a moderately aging society^[2]. Meanwhile, the process of urbanization continues to accelerate, with urban residents accounting for 63.89% of the total population^[3]. However, the outflow of young rural laborers to urban areas has exacerbated the issue of left-behind elderly in rural regions. Data show that 23.81% of rural residents are aged 60 and above, and 17.72% are aged 65 and above, exceeding their urban counterparts by 7.99 and 6.61 percentage points, respectively^[4]. This highlights that the aging problem is significantly more severe in rural areas^[5]. As aging progresses and health conditions decline, the self-sufficiency of left-behind elderly continues to weaken, making the optimization of rural elderly care systems an urgent challenge.

The *Opinions on Strengthening Elderly Care Work in the New Era* further stressed that addressing an aging society is vital to public well-being and social stability^[6]. However, the current elderly care system remains inadequate, and rural left-behind elderly have become a vulnerable group in social

development. Based on an in-depth study and analysis of the living conditions of rural left-behind elderly, this paper proposes a mutual-aid elderly care model centered on healing landscapes, offering a new approach to improving their quality of life and advancing the construction of a *Beautiful Countryside*.

2. Rural Elderly Care Models and Overview of Left-Behind Elderly

2.1 Existing Rural Elderly Care Models

Influenced by Confucian “filial piety” culture, China’s traditional elderly care model primarily relies on family-based support, where three generations live together, and children are responsible for supporting their elderly parents. However, due to the constraints of the dual urban-rural economic structure, a significant number of rural youths migrate to urban areas for work. This migration has led to the miniaturization of family structures and weakened intergenerational connections due to physical separation^[7]. Consequently, traditional family-based elderly care models have gradually disintegrated. Left-behind elderly not only face economic stagnation and declining living standards but also bear the dual burden of agricultural labor and caring for their grandchildren^[8]. Currently, rural left-behind elderly often lack adequate life care, safety protections, emotional support, and suitable living environments.

2.2 Definition of Left-Behind Elderly

Left-behind elderly in rural areas refer to those whose children have migrated for work and are absent from home for at least six months, leaving their elderly parents without companionship. These elderly individuals often live modestly due to economic and cultural underdevelopment, with substandard housing conditions. Additionally, they bear the heavy burden of agricultural labor and raising grandchildren.

3. Current Situation and Challenges of Left-Behind Elderly

3.1 Physical and Mental Health Issues

As physical functions decline with age, rural left-behind elderly commonly suffer from chronic diseases and psychological disorders. Studies indicate that over half of elderly individuals are affected by chronic illnesses such as arthritis, hypertension, and diabetes^[10]. Additionally, 3.2% to 9.9% of them experience mental illnesses, while 39% to 45% struggle with depression and loneliness^[11]. The primary reasons include:

(1)**Overburdened Labor:** Many elderly individuals must balance agricultural labor with the responsibility of caring for grandchildren, leading to accumulated physical and psychological stress, which further deteriorates their overall health.

(2)**Lack of Health Awareness:** Limited financial resources and low levels of education result in insufficient attention to health issues and restricted access to medical resources. Consequently, suicide rates remain high in certain rural areas^[12].

3.2 Inadequate Economic Support

The economic effects of rural labor migration are debated in academia. One perspective suggests that the migration of young rural laborers to urban areas increases household income, thereby improving the economic well-being of elderly family members. Conversely, another perspective argues that labor migration weakens family structures, leading to a decline in the living quality of elderly individuals and exacerbating their social difficulties^[13].

This study posits that, although urban migration provides a certain degree of economic support, the generally low wages of migrant workers mean that most left-behind elderly still rely primarily on farming and livestock rearing as their main sources of income. However, this income is often unstable and insufficient to sustain a high quality of life^[14].

4. Living Spaces under Existing Elderly Care Models

4.1 Traditional Residential Patterns

The lives of rural left-behind elderly are predominantly centered on agricultural labor, with daily activities confined to commuting between fields and their homes. The outflow of young labor and stagnation in rural development have resulted in outdated infrastructure and living conditions. Most elderly individuals, constrained by financial pressures, continue to live in old houses without the ability to improve their living spaces^[14]. As a result, the single "field-to-home" activity pattern significantly impacts their quality of life^[15].

4.2 Agricultural Production-Oriented Residential Spaces

Traditional rural housing was predominantly courtyard-style, but with the rise of urbanization, these traditional courtyards have been replaced by independently constructed houses. This shift has led to the disappearance of courtyard landscapes and their associated functions, such as grain drying and resting. Currently, rural community renewal lacks scientific planning, resulting in agricultural production spaces encroaching on residential and recreational areas. Consequently, elderly residents struggle to access adequate outdoor leisure spaces^[16].

Additionally, the absence of age-friendly facilities and the monotonous living environment further diminish the quality of life for the elderly. Addressing these spatial conflicts through the concept of healing landscapes and constructing a sustainable development system is therefore essential to improving the living conditions of rural left-behind elderly.

4.3 Changes in Rural Social Relationships

Traditional rural societies are characterized as "semi-familiar communities," where frequent interactions between neighbors and relatives foster close-knit social bonds. However, the outflow of young populations has led to a demographic gap in rural areas, leaving elderly individuals to live primarily with their spouses, grandchildren, or entirely alone.

As a result, left-behind elderly experience a declining sense of participation in community management, a diminished sense of self-worth, and, in many cases, social neglect^[17].

5. Healing Landscapes

5.1 Background of Healing Landscapes

Healing landscapes have gained widespread attention in recent years, particularly in Asia, due to their close association with human health and well-being, making them a focal point of contemporary research. Studies have shown that healing landscapes serve as effective supplementary measures to improve mental health and alleviate physical ailments, such as depression and Alzheimer's disease^[18]. The concept aligns closely with the "Good Health and Well-Being" goal outlined in the United Nations' 17 Sustainable Development Goals (SDGs), emphasizing the design of inclusive spaces that enhance overall human health and welfare. Therefore, healing the landscape space is of vital importance for people's physical and mental health.

5.2 The Role of Healing Landscapes

Healing landscapes utilize natural environments to enhance human physical and mental health, offering not only aesthetically pleasing visual experiences but also significant psychological and physiological benefits. The theoretical foundation of healing landscapes originates from Wilson's "Biophilia Hypothesis," which elaborates that interactions between humans and nature can trigger a series of positive responses, including improved physiological functions, emotional regulation, and optimized mental states^[19].

In rural environments, healing landscapes are particularly significant. Elements such as greenery, gardens, fields, and trees not only help individuals relax but also regulate emotions and improve psychological well-being^[20]. Compared to the clean air and quiet atmosphere of cities, rural areas—

with their expansive greenery and the sounds of birds and nature—offer a more profound sense of healing. However, healing landscapes differ from ordinary green spaces or farmland. Farmland is primarily designed for agricultural production and often creates a sense of "distance" or implicit exclusion for non-farmers. In contrast, healing landscapes emphasize openness and inclusivity, allowing diverse groups to engage with the space. By incorporating medicinal plants and multifunctional spaces, they balance the needs of productive and recreational landscapes, ultimately fostering physical and mental health benefits.

Currently, most designed healing landscapes are concentrated in urban areas, highlighting an uneven distribution of resources. This imbalance further exacerbates the disparity between rural and urban regions, underscoring the urgent need for healing landscapes in rural areas.

6. Construction of the Healing Landscape-Based Mutual-Aid Elderly Care Model

6.1 Target Site Analysis and Existing Elderly Care Issues

This study selects a township in Anhui Province, China, as the research site. Field investigations reveal severe population aging and land-use conflicts within the area. The situation of left-behind elderly in this site aligns with national trends, where a significant number of elderly individuals suffer from mental health issues such as depression, while most endure chronic physical illnesses. Additionally, almost all left-behind elderly are engaged in agricultural labor while simultaneously caring for their grandchildren, exacerbating their physical and mental burdens.

To improve the physical and mental health, as well as the living and production modes of left-behind elderly in this region, the study focuses on analyzing their activity patterns and the spatial conflicts they face. The investigation identifies various outdoor activities performed by the elderly, including selling goods, exercising, conversing, caring for grandchildren, walking, farming, drying grain, and dancing in public squares. Since they frequently care for left-behind children, their activities and spatial use often overlap significantly. This analysis provides a clear direction for optimizing the functional design of the site.

The outmigration of young laborers has reduced the primary labor force in the village, resulting in lagging social development and outdated infrastructure. Public activity spaces are limited, with only two main locations available:

Township Square: Located at the county-town center, this square comprises a hard-paved area and a waterscape pond area. The hard-paved section is a major space for resident activities and serves as a thoroughfare to the school playground. However, conflicts arise between spontaneous vending activities by residents and daily recreational activities, causing spatial disorganization. The pond area is partially abandoned, obscured by overgrown plants and advertising boards(Figure 1).

Village Square: Smaller in size, the primary issue here is the conflict between the elderly's need to dry grain and their daily activities. The rough design further diminishes usability, such as the lack of shading in rest corridors, which forces the elderly to seek shade by crouching against walls rather than using the seating provided(Figure 1).

Additionally, one environmental issue in the village is water pollution: The use of chemical fertilizers leads to residual chemicals being washed into abandoned ponds and canals during the rainy season, contaminating the water bodies(Figure 1).



Figure 1. Summary of Existing Issues in the area

Source: Created by the author

In summary, the current situation is characterized by the encroachment of production spaces on living spaces, leading to insufficient daily activity areas for left-behind elderly (Figure 1). After completing labor-intensive tasks, they lack environments that provide emotional solace and recreational opportunities, exacerbating their psychological and physical health issues. At the same time, issues within the original ecosystem have led to damage to the site's functionality and a diminished experience of the living environment.

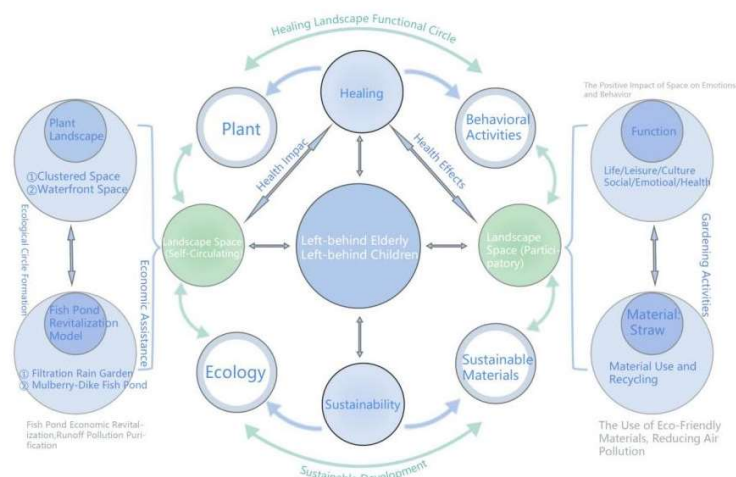


Figure 2. Conceptual Framework for Healing System Design

Source: Created by the author

6.2 Introduction to the Design System

This system is based on the concept of healing landscapes and aims to create a design framework that benefits both left-behind elderly and the local ecosystem through the self-circulating and participatory nature of landscape spaces. The primary goal is to improve rural productive landscapes while optimizing the living environment and lifestyle of left-behind elderly (Figure 2).

Promoting the Physical and Mental Health of Left-Behind Elderly

The system addresses the health of left-behind elderly through two key strategies:

Medicinal Plant Landscapes: By cultivating medicinal plants with therapeutic properties, the design creates clustered plant landscapes and waterfront spaces that leverage the plants' aromas and properties to promote physical healing for the elderly.

Rehabilitation Behavior Guidance: Healing landscapes are designed to encourage the elderly to engage in rehabilitative behaviors within the space, positively influencing their emotions and guiding their behaviors. This aspect focuses on meeting the elderly's needs for living, leisure, culture, social interaction, emotional well-being, and health.

Ensuring Sustainable Development of the Site

Healing landscapes also play a critical role in supporting the site's sustainable development. The implementation of filtration rain gardens and mulberry-dike fish ponds revitalizes abandoned fishponds, providing additional economic opportunities for left-behind elderly while effectively mitigating secondary water pollution caused by fertilizer-laden rainwater runoff. The selected plant species prioritize healing functions, combining ecological and health benefits.

Sustainable Material Utilization

The sustainable use of materials is another key element of the design. Harvested agricultural byproducts, such as straw and wheat, are processed into eco-friendly building materials and non-polluting organic fertilizers. This approach minimizes pollution caused by burning crop residues and reduces reliance on chemical fertilizers, thereby promoting ecological conservation and resource recycling.

6.3 Site and Functional Model Analysis

This study analyzes site issues and proposes the specific roles of healing landscapes in resolving these conflicts. It also explores how planning and design can encourage left-behind elderly to participate in the construction of public facilities, promote mutual-aid elderly care among villagers, and enhance their sense of community participation and confidence in life. The planning framework focuses on four main directions(Figure 3):

- (1)Updating three experimental sites to improve the practicality of public spaces.
- (2)Activating abandoned village spaces with “implant module” landscape furniture, linking the sites to enhance community communication, convenience, and safety.
- (3)Incorporating plants with healing functions into activity spaces across the entire village.
- (4)Promoting age-friendly design to improve accessibility and support for left-behind elderly.



Figure 3. Overall Site Master Plan

Source: Created by the author

6.3.1 Site Updates

The design plan addresses existing conflicts by optimizing and reallocating functional zones based on current site conditions:

Site 1: Township Square

The issue primarily lies in the conflict between leisure activity spaces and residents' commercial activities. The proposed solution addresses this by expanding the hard-surfaced leisure activity areas and incorporating functional zones that cater to the activity needs of the elderly. The economic activity area is relocated to the street-facing side. In terms of landscaping, the original small woodland is updated into a "healing forest," and the abandoned pond undergoes ecological restoration, with a walking path added around the water. The previously underutilized and poorly planned space is transformed into a multifunctional recreational area suitable for both young and elderly individuals, incorporating zones such as sales areas, a sand pit, a healing box, an activity area, a healing forest, a fish pond, and a health trail. The updated township square is more human-centered, combining therapeutic and recreational elements(Figure 4).

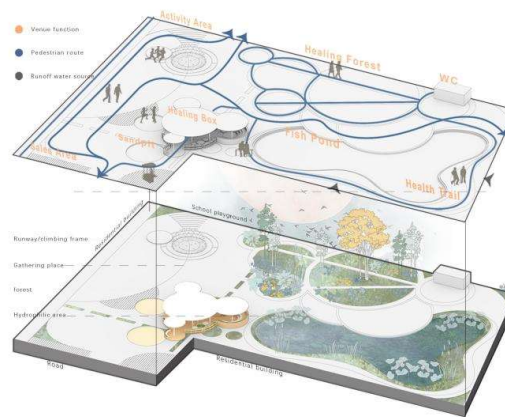


Figure 4. Updates of the Three Site Areas

Source: Created by the author

Site 2: Village Square

The main issue concerns the spatial conflict between the need for drying crops and daily activities. The proposed solution involves re-planning the space through functional zoning, effectively separating agricultural and leisure activities to meet the diverse needs of the elderly left-behind population. The key functional zones include shaded areas, activity areas, a sand pit, and a healing box(Figure 5).

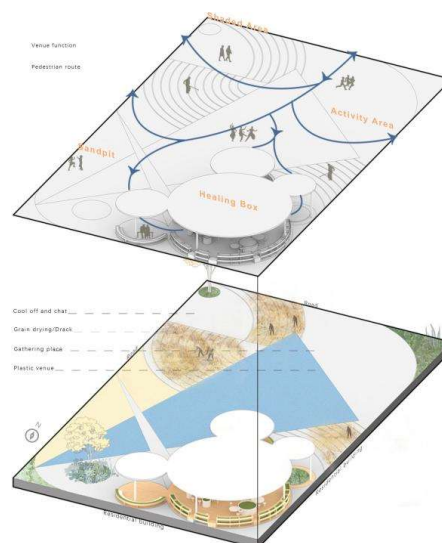


Figure 5. Updates of the Three Site Areas

Source: Created by the author

Site 3: Abandoned Fish Pond

Site 3 is an abandoned pond, which, after revitalization, will provide both landscape and economic benefits for the elderly left behind. The proposed solution involves purifying the original pond to meet the conditions for aquaculture, and incorporating a curved pathway to enhance its aesthetic appeal. Additionally, the surrounding open space will be updated with functions for daily activities, thus linking productive and recreational landscapes. This integration can indirectly boost the positive emotions of elderly residents engaged in agricultural work, while improving the convenience of resting areas. The updated functional zones include a basketball court, a small square, a healing box, a farmed fish pond, Kuwata (Mulberry-Dike Fish Pond, agricultural landscape), and a viewing bridge (Figure 6).

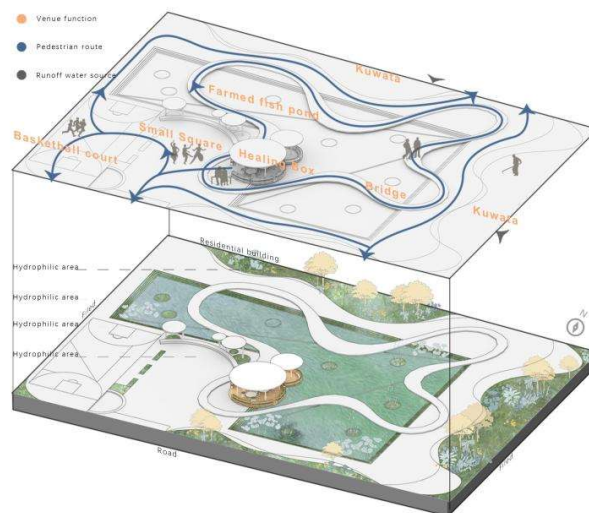


Figure 6. Updates of the Three Site Areas

Source: Created by the author

Water Purification Design

The ponds at Site 1 and Site 3 are designed as an “ornamental fish pond” and a “fish farming pond,” respectively. Targeting the primary pollution source (fertilizer runoff from nearby farmland), differentiated purification schemes are adopted:

Ornamental Fish Pond at Site 1

A walking path and gravel surface intercept sediment runoff during the rainy season. The pond banks are planted with Canna, *Thalia dealbata*, and reeds to filter water, while water lilies are planted at the pond bottom for additional purification and aesthetic value. Fish species such as red carp and blister fish are introduced for ornamental purposes.

Fish Farming Pond at Site 3

A multi-layered plant purification system is designed to filter runoff step-by-step. The system includes a “filter box” (comprising water layers, soil layers, gravel layers, and other components) and riparian plants such as wind mill grass and calamus to absorb pollutants. Additionally, an “ecological dam” made of geotextile, stones, and other materials is installed between the pond and the soil to block heavy metal contamination.

A notable feature of this site is the “aquatic vegetable raft,” a floating structure for planting water celery. The roots of these plants absorb water pollutants, and the vegetables can be sold or consumed as economic products (Figure 10). Mulberry trees are planted around the pond, and silkworm farming is introduced, forming the “Mulberry-Dike Fish Pond” model. This approach simultaneously enhances aquaculture and agricultural income, achieving dual economic benefits.

6.3.2 Healing Boxes and Age-Friendly Design

The design concept of a "healing box" is incorporated into each site. This design can be scaled up or down in appearance to fit different site sizes, while the core functionality remains unchanged. A "healing box" is a semi-enclosed, multifunctional space that integrates the common activity needs of both elderly left-behind individuals and children (figure 7). The primary components include a shared space, a social space, a fragrant plant area, a gardening wall, and a rest area. The plants in the gardening wall are all therapeutic plants, which help promote the restoration of human health, particularly through their scents. Additionally, previous surveys revealed that local elderly individuals enjoy planting flowers in abandoned wall corners. The healing box provides them with an aesthetically pleasing and comfortable space to enjoy and cultivate flowers, thereby adding interest to their daily lives.

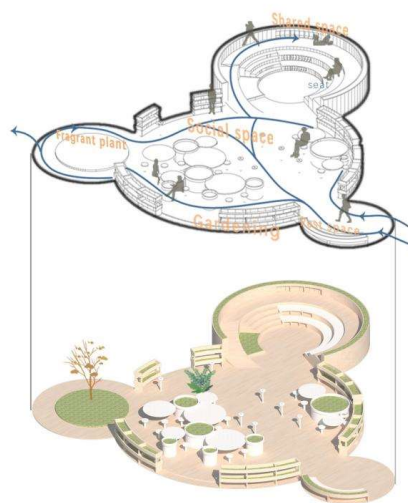


Figure 7. Healing Box Model

Source: Created by the author

Age-friendly design principles are applied throughout the site. Walking paths are constructed with cobblestone surfaces, combining anti-slip properties with foot massage benefits. To accommodate wheelchair users, the paths are designed with a width of 1,800 mm, allowing two wheelchairs to pass simultaneously. Resting benches are placed every 15 meters, while handrails are provided at two heights—86 cm and 66 cm—to suit the average height of elderly individuals (1.38 m to 1.60 m). These thoughtful design details demonstrate care for the elderly population and their specific needs.

6.3.3 Implant Module

The Implant Module is a modular landscape facility designed with an emphasis on convenience and community participation. The materials are sourced from recycled straw, and the modular design ensures ease of assembly and maintenance for elderly users. The design incorporates ergonomic considerations tailored to the physical capabilities of elderly individuals (e.g., lifting heights of approximately 1.48 m for men and 1.28 m for women), enabling them to participate in constructing and managing the facilities with ease.

The modules can be configured flexibly to meet different needs, such as single-person use, parent-child activities, two-person conversations, or multi-person social interactions. Beyond enhancing the aesthetic environment, the modules also provide spaces for leisure and entertainment for both the elderly and children.

Another significant role of the Implant Module is to encourage left-behind elderly to engage in landscape and community management, thereby enhancing their sense of self-worth. During the study, multiple left-behind elderly individuals were invited to participate in the construction of the

modules(Figure 8). Their enthusiastic involvement demonstrated the feasibility and popularity of this design concept.



Figure 8. The Implant Module

Source: Created by the author

6.3.4 Healing Plant Design

The design of healing plants is based on the theory of "five-sense healing," aiming to enhance the physical and mental health of left-behind elderly through five dimensions: vision, hearing, smell, touch, and taste.

(1)**Vision:** Plants with vivid seasonal colors are selected to bring vibrant visual stimulation and evoke positive emotions.

(2)**Hearing:** The rustling of leaves and the chirping of birds create a soothing and relaxing auditory environment.

(3)**Smell:** Aromatic plants such as lavender and geranium are cultivated to help alleviate anxiety and promote respiratory health.

(4)**Touch:** Elderly individuals are encouraged to engage in gardening activities, such as cultivating medicinal plants or participating in horticultural operations. These actions can stimulate cognitive and motor functions, improving attention, thinking, and management skills.

(5)**Taste:** Edible fruit and vegetable planting areas are designed, allowing elderly individuals to experience satisfaction through the process of growing and consuming fresh produce.

Healing landscapes offer unique advantages by integrating five core functions: social interaction, introspection (therapeutic facilities), physical exercise, natural interaction, and positive guidance. These functions are not comprehensively provided by conventional agricultural landscapes or urban parks. By incorporating healing plant designs, high-quality outdoor spaces are created for left-behind elderly in rural areas. These spaces not only help relax the body and mind but also effectively reduce health risks and improve overall well-being.

7. Conclusion

This study systematically analyzes the current living conditions of left-behind elderly in rural China and summarizes the major challenges they face. These challenges include the lack of elderly care facilities, the dominance of single-function agricultural production spaces that compress living spaces and negatively impact quality of life, as well as the low health levels of left-behind elderly, who are at high risk of both physical and mental health problems.

Against this backdrop, this study, aligned with the *Beautiful Countryside* policy, proposes using healing landscapes as an intervention to construct a multi-dimensional, hierarchical, and mutual-aid

model of rural healing landscapes for left-behind elderly. The core concept is to create a spatial framework that integrates production, living, and ecology, revitalizing rural elderly care facilities. Through the integration of healing landscapes, this framework encourages mutual support and self-sufficiency among left-behind elderly. It is expected that this system can effectively improve the living conditions of left-behind elderly, providing them with a healthier and more enjoyable living environment.

Additionally, this research aims to promote public participation in the construction of an autonomous environmental management system, fostering a collective, sustainable, and community-oriented *Beautiful Countryside*. It offers new approaches and practical references for addressing rural development and elderly care issues in the context of modern China.

References

- [1] National Bureau of Statistics (2024) 'Statistical bulletin of the People's Republic of China on national economic and social development in 2023' [online]. Available at: https://www.stats.gov.cn/sj/zxfb/202402/t20240228_1947915.html (Accessed: 1 May 2024).
- [2] National Bureau of Statistics (2019) 'Statistical Communiqué of the People's Republic of China on the 2019 National Economic and Social Development' [online]. Available at: <http://www.lawinfochina.com/display.aspx?id=33158&lib=law> (Accessed: 1 May 2022).
- [3] Chinese Government Website (2021) 'Communiqué of the Seventh National Population Census: Population, Ethnicity and Customs' [online]. Available at: http://www.gov.cn/guoqing/2021-05/13/content_5606149.htm (Accessed: 1 May 2022).
- [4] Huang, J. and Tan, J. (2024) 'Research on the dilemma and countermeasures of home-based elderly care services for rural left-behind elderly', *Industry and Technology Forum*, 23(23), pp. 40–42.
- [5] Yao, Z. (2021) 'Exploring the development of new mutual aid elderly care models in rural areas', *The Masses*, 12, pp. 53–54.
- [6] State Council (2021) 'Opinions of the Central Committee of the Communist Party of China and the State Council on strengthening the work of the elderly in the new era' [online]. Available at: https://www.gov.cn/gongbao/content/2021/content_5659511.htm (Accessed: 1 May 2024).
- [7] Wang, H.-L. and Cheng, J.-J. (2018) 'Research on the dilemma of "hollowing out" of population and multiple supply of rural elderly services', *Journal of Henhai University (Philosophy and Social Science Edition)*, 20(1), pp. 17–24, 89–90.
- [8] Ibid.
- [9] Federal Interagency Forum on Aging-Related Statistics (2012) *Older Americans 2012: Key Indicators of Well-Being*. Washington, DC: Government Printing Office.
- [10] Ibid.
- [11] Zhou, L. et al. (2019) 'Being left-behind, mental disorder, and elderly suicide in rural China: A case-control psychological autopsy study', *Psychological Medicine*, 49(3), pp. 458–464. Available at: <https://doi.org/10.1017/S003329171800106X>.
- [12] He, C. and Ye, J. (2009) 'A review of research on rural left-behind elderly', *Journal of China Agricultural University (Social Science Edition)*, 26(2), pp. 24–34. DOI: 10.13240/j.cnki.caujsse.2009.02.003.
- [13] Xu, H. and He, C. (2020) '"Filial piety but difficult to raise": Rethinking the plight of the elderly left behind in rural areas', *Journal of China Agricultural University (Social Science Edition)*, 37(4), pp. 101–111. DOI: 10.13240/j.cnki.caujsse.2020.04.012.
- [14] Wang, J. and Cao, C. (2009) 'Research on the problem of "left-behind elderly" in the perspective of new rural construction', *Agricultural Archaeology*, (6), pp. 76–78.
- [15] 'Old Age in Rural China' <<https://news.cgtn.com/news/3d3d674e30457a4d34457a6333566d54/index.html>> [accessed 19 May 2022].
- [16] Zou J. Construction of design strategies for residential forms and suitable environments for the elderly left behind in rural areas[J]. *Design*, 2021, 34(19):110-112.
- [17] Li, H. (2022) 'From vulnerability to resilience: A study of risk aversion among rural elderly left behind under the concept of common prosperity', *Scientific Research on Aging*, 10(2), pp. 12–26.

- [18]Noone, S. et al. (2017) ““The nourishing soil of the soul”: The role of horticultural therapy in promoting well-being in community-dwelling people with dementia’, *Dementia*, 16(7), pp. 897–910. Available at: <https://doi.org/10.1177/1471301215623889>.
- [19]Bossen, A. (2010) The importance of getting back to nature for people with dementia. *Journal of Gerontological Nursing* 1(36): 17–22.
- [20]Kaplan S,Talbot J F.Psychological Benefits of a Wilderness Experience[M].*Behavior and the Natural Environment*,Altman I,Wohlwill J F,Boston,MA:Springer US, 1983,163-203.