

Revitalizing Old Residential Areas through Innovative Landscape Space Design: An Urban Acupuncture Approach

Qin Wang¹, Noor Fazamimah Mohd Ariffin², Faziawati Abdul Aziz³, Khair Eddine Demdoum⁴

Department of Architecture, Faculty of Design and Architecture, Universiti Putra Malaysia, Serdang Selangor, Malaysia^{1,2,3,4}

Email: gs61651@student.upm.edu.my¹, fazamimah@upm.edu.my², faziawati@upm.edu.my³, gs49946@student.upm.edu.my⁴

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i12/23844> DOI:10.6007/IJARBSS/v14-i12/23844

Published Date: 26 December 2024

Abstract

Rapid urbanization and aging residential areas present critical challenges to sustainable urban development in China. This study investigates the efficacy of urban acupuncture—a design strategy inspired by traditional Chinese medicine—in addressing these issues through precise, small-scale interventions. Focusing on the Nanchang Cigarette Factory Residential Area, a mixed-method approach combining descriptive statistics and stepwise multiple regression analysis was employed to evaluate data from 200 structured surveys. The findings reveal four transformative strategies: Adjusting Organ Function, Activating Acupoint Spaces, Unblocking the Meridian System, and Injecting Cultural Blood. These strategies improve infrastructure, enhance spatial layouts, and incorporate cultural heritage to revitalize neglected urban areas. This research offers a practical framework for revitalizing aging neighborhoods and promoting sustainable urban renewal. This study provides practical insights for policymakers and urban planners to enhance urban vitality and resilience.

Keywords: Urban Acupuncture, Old Residential Area, Space Creation, Urban Vitality

Introduction

Urban economies and urbanization have grown rapidly, advancing cities at an unprecedented pace. While this expansion has accelerated urbanization, it has also placed immense pressure on urban areas, resulting in a variety of complex challenges. Numerous long-established metropolitan regions frequently face various difficulties, including the degradation of infrastructure (Xueqiang et al., 2023), congested transportation networks (Othman & Ali, 2020), insufficient urban planning, outdated public amenities (Harun et al., 2021), and significant environmental pollution (Ling et al., 2020). Urbanization and its challenges have drawn significant attention, leading to urban redevelopment initiatives across China.

(Lahamendu et al., 2017). In this context, urban acupuncture plays a vital role in tackling challenges related to landscape design in older residential areas. This study highlights the need to address issues in aging residential landscapes by examining urbanization challenges and restoration strategies. This approach seeks to reduce the negative impact of these areas on urban development while fostering sustainable and innovative urban environments

The focus on the Nanchang Cigarette Factory Residential Area in Jiangxi Province, China, enables a detailed examination of its distinct challenges. These encompass issues in physical infrastructure, green spaces, parking facilities, road networks, and sidewalks. The severity of these challenges, impacting the built environment, landscape, and social connections, significantly affects the overall well-being of the region. This case study presents an opportunity to apply urban acupuncture theory, addressing the aesthetic and sensory concerns within aging natural spaces of residential environments. The primary aim of this research is to provide insights conducive to sustainable urban growth and the preservation of the urban environment.

Research Background

Research Context and Elucidation of the Urban of the Acupuncture and Moxibustion Theory Concept

The significance of urban planning and design has increased in response to the challenges faced by expanding cities worldwide. Urban Acupuncture, a concept that merges traditional Chinese medicine principles, particularly acupuncture, with strategies for revitalizing urban environments, introduces an innovative approach to this field. This innovative concept has become increasingly recognized in urban design and development (Al-Hinkawi & Al-Saadi, 2020; Roggema, 2020; Salman & Hussein, 2021).

Urban Acupuncture

Barcelona architect and urbanist Manuel de Sola Morales developed the concept of Urban Acupuncture in 1982 (Jooshani & Polat, 2019; Hemingway & De Castro Mazarro, 2022). He believed that the renewal and activation of a city are akin to treating a human organism. To encourage urban renewal and development, it is essential to identify the city's issues, assess their severity, and intervene with design solutions that are minimal in cost and scale. This design concept draws inspiration from ancient Chinese medical acupuncture, aiming to rejuvenate urban 'muscle,' unblock 'meridians,' and achieve therapeutic effects. Urban acupuncture is a design strategy focused on revitalizing specific neighborhoods to improve urban functionality.

Influenced by traditional Chinese medicine, Urban Acupuncture is a novel urban design method. Acupuncture, an ancient medical treatment, involves inserting thin needles into specific body parts to elicit a therapeutic response. Similarly, Urban acupuncture focuses on small-scale interventions in specific areas, particularly older residential districts, to revitalize urban landscapes (Manouchehri et al., 2022). Like acupuncture points and meridians in the human body, a city has vital nodes, public spaces, and community areas that are crucial for urban functionality (Bandeira et al., 2021; Calzada, 2021). These essential elements and strategic initiatives aim to enhance the city's overall well-being.

The benefits of urban acupuncture extend beyond mere aesthetic improvements. The approach encompasses how urban connectedness impacts citizens' well-being and their sense of belonging. Urban acupuncture, like its medical counterpart, seeks to create a harmonious urban environment by addressing social cohesion, sustainability, and cultural preservation.

Elucidation of the Concept

Urban acupuncture is a flexible and responsive approach to urban revitalization that acknowledges the unique characteristics of different cities and municipalities (Yu, 2021). This approach emphasizes the importance of respecting indigenous culture, history, and context. Unlike conventional urban regeneration, which often involves large-scale demolition and redevelopment, urban acupuncture offers distinct advantages. It promotes small-scale, cost-effective interventions aimed at producing immediate and noticeable impacts on specific locations, while minimizing extensive upgrades to urban infrastructure. The concept of urban acupuncture is known to elicit a catalytic effect on the surrounding urban environment (Yu, 2021). Localized improvements can benefit surrounding communities and promote broader urban renewal.

The urban acupuncture framework emphasizes sustainability as a core principle (Raoufi & Shieh, 2023). This concept includes both ecological and cultural sustainability, aiming to enhance the ecological aspects of the urban environment while also protecting the cultural heritage of historical districts. Urban acupuncture considers the unique needs, cultural characteristics, and historical significance of each city and area (Yang et al., 2021; Tousi et al., 2022). Within this context, 'old and decaying residential areas' typically refer to localities built before the year 2000, characterized by aging infrastructure and a marked need for revitalization (Mahdianpoor et al., 2019). Landscape design in historical residential districts incorporates both physical elements and cultural aspects to meet the needs of residents and the evolving demands of the urban environment, all while preserving and celebrating the unique character of the locality (Li, 2022).

This approach offers a viable alternative to traditional urban planning for revitalizing cities. It focuses on enhancing the well-being and happiness of city residents, fostering environmentally friendly urban areas, and preserving the historical and cultural heritage of the city (Balicka et al., 2021; Yu, 2021). The proposed method of city improvement considers a broad spectrum of factors, acknowledging that cities have energy hubs which, when effectively addressed, can contribute to making them healthier and more vibrant places overall (Al-Hinkawi & Al-Saadi, 2020; Roggema, 2020).

Materials and Methods

Research Site



Figure 1: Location of the Residential Area

Source: Westlake URA Planning Information

The study focuses on revitalizing the West Lake District. Study area located in the heart of Nanchang; the West Lake District includes more than 300 large residential areas covering 13.18 million square meters. Over 126,800 residences in 255 communities that were built before 2000 are faced with problems with declining public spaces, roads, and services.




Indicators of Selection

The centrally located Nanchang Cigarette Factory Residential Area is an ideal case study for addressing similar challenges in urban areas. Positioned in a highly accessible region, The area faces challenges such as aging infrastructure, unauthorized constructions, and inadequate governance. Analysing these challenges in this case study offers valuable insights into the revitalization of aging urban spaces. Additionally, the Nanchang Cigarette Factory Residential Area holds profound historical and cultural significance, representing the unique local culture and history. Governance issues in the area allow for exploring strategies to improve management, address planning challenges, and enhance community well-being.

Current Issues

The Nanchang Cigarette Factory Residential Area is currently grappling with various issues related to its physical infrastructure, covering aspects such as the built environment, green spaces, parking facilities, road networks, and sidewalks. Furthermore, concerns exist regarding the presence of flora, the overall state of infrastructure, and a lack of social connections with the indigenous populace. These issues have a significant impact on the overall well-being of the region and require comprehensive resolution to foster a thriving and harmonious community

Table 1
Current Issues

Live photos	Description
	<p>Building Condition: The exterior facade shows signs of decay with mottled and damaged surfaces, detached wall skin, and randomly flying wall pipelines</p>
	<p>Landscape and Green Areas: The house landscape appears disorderly, with dim lighting and cluttered space filled with debris</p>
	<p>Road Network and Parking Facilities: Disorderly vehicle parking in parking lots, inadequate planning for parking spaces on residential roads, resulting in chaotic parking</p>
	<p>Emotional Resonance: Low-quality billboards and cultural columns With outdated content and visual deterioration impact the overall aesthetic of the area</p>
	<p>Infrastructure Management: Amenities go neglected and deteriorate, which lowers the standard of living for locals</p>

Source: From Author

Data Collection

A three-month comprehensive survey was conducted. Spanning 16 buildings and around 630 households, the research utilized offline paper questionnaires and interviews with permanent

residents, community staff, and residential management personnel. Focused on demographics, outdoor activities, activity spaces, resident needs, and satisfaction levels, the survey accommodated the predominantly elderly population through a strategic schedule from 9:30 am to 8:30 pm on both weekdays and weekends. Out of 200 distributed questionnaires, 185 were valid after excluding 15 incomplete responses. The second phase of the survey goes beyond evaluating residents' physical and outdoor activities. It also encompasses an assessment of variables related to optimizing and enhancing various aspects of a residential area using the principles of URBAN ACUPUNCTURE. Experts are tasked with rating these variables for their effectiveness.

Data Analysis

To categorize the variables contributing to the optimization and enhancement of various attributes of a residential area using urban acupuncture principles, a two-step statistical approach was employed. This involved descriptive analysis and stepwise multiple regression. SPSS was utilized to conduct the analysis.

Results and Discussion

Descriptive Results

The final effective response rate was 92.5%. The residents are mainly aged between 40 and 60, with a significant proportion being retirees from the cigarette factory, comprising approximately one-fourth of the total population, aged 60 and above. The age distribution of activity groups includes 22.6% preschool children, 15.4% minors aged 6-18, 6.2% young adults aged 18-40, 25.1% middle-aged individuals aged 40-60, and 30.7% elderly individuals aged 60 and above. The aging population in the residential area, particularly the elderly and preschool children, constitutes most of the activity groups. Regarding support for residential area renovation, 83.2% of residents expressed strong support, 12.3% were indifferent, and 4.5% believed renovation was unnecessary. This underscores the residents' strong desire to actively participate in the improvement of their living environment (table 2).

Outdoor activity analysis revealed that 28.3% of residents engage in sports exercises, 19.6% prefer chatting and relaxing, 15.7% enjoy scenic walks, 2.3% participate in recreational activities such as playing cards or chess, and 33.6% are involved in childcare activities. The age-specific breakdown indicates that elderly individuals primarily focus on sports exercises (40.1%), childcare (23.3%), chatting and relaxation (15.4%), playing cards or chess (7.7%), and scenic walks (13.5%). Preschool children engage in play (40.8%), socializing (20.1%), nature exploration (25.8%), and discovering new things (13.3%). Outdoor activities for the elderly in the residential area are concentrated during specific time periods: 7:00-11:00 am, 3:00-5:00 pm, and 6:00-7:00 pm. In summary, the survey underscores the vital need to revitalize outdoor spaces to meet diverse resident needs. The analysis reveals significant dissatisfaction among residents, especially the elderly, with poorly maintained outdoor spaces. Critical issues drive residents to advocate for the enhancement of their living environment.

Table 2

Survey Results: Demographic Profile and Outdoor Activities

Sample	Percentage
Total Questionnaires Distributed	200
Valid Responses	185
Effective Response Rate	92.50%
Retirees from Cigarette Factory (60+ years old)	25.30%
Preschool Children (age group)	22.60%
Minors (6-18 years old)	15.40%
Young Adults (18-40 years old)	6.20%
Middle-aged (40-60 years old)	25.10%
Elderly (60+ years old)	30.70%
Support for Renovation	83.20%
Indifferent to Renovation	12.30%
Oppose Renovation	4.50%
Outdoor Activity - Sports	28.30%
Outdoor Activity - Chatting/Relaxing	19.60%
Outdoor Activity - Scenic Walks	15.70%
Outdoor Activity - Games (Cards/Chess)	2.30%
Outdoor Activity - Childcare	33.60%
Elderly - Sports	40.10%
Elderly - Childcare	23.30%
Elderly - Chatting/Relaxing	15.40%
Elderly - Games (Cards/Chess)	7.70%
Elderly - Scenic Walks	13.50%
Preschool - Play	40.80%
Preschool - Socializing	20.10%
Preschool - Nature Exploration	25.80%
Preschool - Discovering New Things	13.30%

Urban Acupuncture Design Practices

To identify variables that optimize and enhance residential areas through urban acupuncture. The stepwise regression revealed in the first step that, "Adjusting Organ Function" contributed to 15% of the variability (Table 3). Subsequent steps introduced "Activating Acupoint Spaces," "Unblocking the Meridian System," and "Injecting Cultural Blood," each increasing the explanatory power. The final model, with "Injecting Cultural Blood," achieved

an R-Squared of 48%. All variables were statistically significant, with 'Injecting Cultural Blood' being the most impactful.

Table 3

Stepwise Regression Findings

Step	Variable Added/Removed	R-Squared	Adjusted R-Squared	F-Value	p-Value
1	Adjusting Organ Function	0.15	0.12	8.42	0.006
2	Activating Acupoint Spaces	0.28	0.25	15.67	0.012
3	Unblocking the Meridian System	0.39	0.36	22.89	0.018
4	Injecting Cultural Blood	0.48	0.44	29.34	0.025

The next section provides a detailed discussion of the four strategies of urban acupuncture design to optimize and enhance residential areas, namely: Adjusting Organ Function, Activating Acupoint Spaces, Unblocking the Meridian System, and Injecting Cultural Blood.

Adjusting Organ Function

The principle of urban acupuncture emphasizes preserving the unique character of historic residential districts, designed with deliberate and logical spatial arrangements. This approach targets specific areas to improve functionality and enhance the vitality of the residential neighborhood.



Figure 1: Aerial view of the old and the new

Source: From Author

Optimizing Landscape Layout for Diverse Activities

The landscape design for Nanchang Cigarette Factory Residential Area addresses site conditions, allocates space, incorporates green elements, and meets resident requirements.

Emphasizing resource reuse, it preserves the ecological environment while creating a natural, comfortable, and inviting landscape. The design introduces new nodes, pocket parks, leisure areas, and cultural components, enhancing the residential neighbourhood. The inclusion of small gardens and micro-landscapes boosts vegetation, elevating residents' quality of life.

Enhancing Green Spaces and Cultivating Diverse Plant Life

To enrich the greenery of the Nanchang Cigarette Factory residential area, the strategy involves planting more trees and plants in existing open spaces, lawns, and roadside areas. Tree planting along roads creates tree-lined pathways, while flower and shrub arrangements address concerns about tree scarcity and aesthetic diversity. Green strips and plants in road medians are strategically placed to create a forested landscape, utilizing existing trees for visual appeal. Permeable materials like grass pavers in parking lots enhance aeration, supporting plant growth. Trees in parking areas not only serve functional roles but also contribute to aesthetics and environmental well-being, mitigating high temperatures. Diverse plant species selection ensures a year-round green environment with seasonal blossoms, various hues, and an aesthetically pleasing outdoor setting.

Activating Acupoint Spaces

The Urban Acupuncture concept focuses on activating specific acupoints in residential areas, aiming to transition space renewal from quantitative to qualitative. Utilizing strategic catalytic nodes, this functional space stimulates adjacent public areas, emphasizes indigenous cultural attributes, and enhances the overall residential experience. This approach facilitates the progressive revitalization of the antiquated residential zone.

Refining Space Functionality and Utilization

The layout's functionality is optimized to meet the specific needs of the Nanchang Cigarette Factory residential area, ensuring a well-structured and practical design. Current spaces are configured to accommodate greenery and ecological landscapes, promoting cost-effective maintenance and sustainable landscape development. Multifunctional spaces lower transportation energy use and improve residents' well-being the significance of lands. The design focuses on creating dynamic and inventive environments that cater to various activities, including recreation, fitness, gaming, leisure, and social interactions.

Utilizing Idle Spaces for Dynamic Recreational Activities

Considering the demographic shift with an aging population and declining birth rate, the architectural design prioritizes the predominant user groups in Nanchang Cigarette Factory's residential neighbourhood: the elderly and children. The design includes features for all age groups, creating spaces that encourage relaxation and activity. Specifically designed to encourage intergenerational interaction, outdoor environments cater to the distinct requirements and preferences of both older adults and children.

Unblocking the Meridian System

The separation of people and vehicles through strategic planning transforms previous disorder into order. The residential area, once characterized by a mix of people and traffic, faced issues like highly concentrated traffic, slow vehicular movement during peak travel times, and conflicts between parking and public green spaces. Addressing these challenges, the transformation emphasizes finding a reasonable balance between green and parking

space utilization in public areas. This is achieved through reorganizing the road system and planning car parks, transitioning from a mixed flow of people and vehicles to their deliberate separation. The infrastructure improvements provide a more organized and livable environment.

Improving Traffic Flow and Parking

To tackle residential challenges, a comprehensive urban strategy transformed an abandoned garden into a multi-level parking area, addressing bicycle and electric car parking issues. Structures with permeable surfaces, blue polycarbonate roofs, and integrated charging stations were introduced, enhancing parking infrastructure. Optimization of underutilized spaces involved removing unregulated areas and transforming derelict green spaces. Road surface renovations prioritized efficiency and aesthetic appeal, incorporating eco-friendly materials like grass bricks for parking lots. The infrastructure featured permeable surfaces for roads and walkways, aligning with the concept of a sponge city and promoting rainwater harvesting for sustainability.

Injecting Cultural Blood

The design of the Residential Area focuses on the continuation of the historical lineage, the reduction of quantity and enhancement of quality, and the renewal of the existing stock. Retaining cultural memories, micro-renewal brings great happiness. The implementation of progressive organic renewal and micro-renovation will help preserve the historical heritage, neighbourhood, and social structure. When residential areas are refreshed, what is left behind is the original design intent and deep cultural heritage.

Creating Unique Memories

To preserve the historical significance of the Residential Area, public notice boards were revitalized, featuring antique cigarette boxes used for communication and spatial partitions. The redesigned entryway integrated traditional elements like grey walls and red bricks, honouring the area's history. This transformation yielded a unique architectural style that blends classic allure with contemporary appeal.

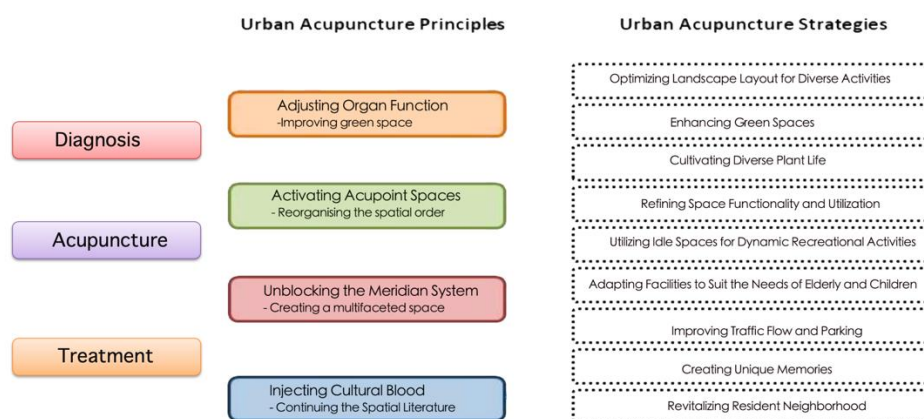


Figure 2: Design process
Source: From Author

Conclusion

In conclusion, this study employs 'urban acupuncture' to explore landscape space design in historical residential neighbourhoods, metaphorically treating aging districts as biological organisms. The proposed plan rejuvenates green spaces, optimizes spatial layouts, preserves historical treasures, and infuses cultural vitality. The findings underscore the importance of landscape preservation, sustainable development, and ecological improvements while safeguarding residents' rights. Noteworthy for incorporating resident feedback and landscape preservation, the research advocates ongoing use of 'urban acupuncture' principles in urban planning. This study integrates theory and practice, highlighting landscape preservation, sustainable development, and resident involvement in revitalizing historical areas.

References

- Al-Hinkawi, W. Sh., & Al-Saadi, S. M. (2020). Urban Acupuncture, a Strategy for Development: Case Study of Al-Rusafa, Baghdad. *IOP Conference Series: Materials Science and Engineering*, 881(1), 012002.
- Balicka, J., Storie, J., Kuhlmann, F., Wilczyńska, A., & Bell, S. (2021). Tactical urbanism, urban acupuncture, and small-scale projects. *In Urban Blue Spaces* (pp. 406–430). Routledge.
- Bandeira, M., Corais, F., & Pereira, F. (2021). Coexistence of urban regeneration policies and sustainable mobility: Reflections on, and practical cases of, urban acupuncture. *In Sustainable Urban Development: Topics, trends and solutions*. IOP Publishing.
- Calzada, I. (2021). Book Review : Smart City Citizenship. *Journal of Contemporary Urban Affairs*, 5(1), 113–118.
- Hemingway, J. M., & De Castro Mazarro, A. (2022). Pinning down Urban Acupuncture: From a Planning Practice to a Sustainable Urban Transformation Model? *Planning Theory & Practice*, 23(2), 305–309.
- Harun, N. Z., Jaffar, N., & Mansor, M. (2021). The contributions of public space to the social sustainability of traditional settlements. *Planning Malaysia*, 19.
- Jooshani, B., & Polat, S. (2019). Transforming public spaces through urban acupuncture. In *LIVENARCH VI Livable Environments & Architecture 6th international congress* (pp. 76–588). Trabzon, Turkey.
- Lahamendu, V., Waani, J. O., & Tungka, A. E. (2017). Revitalization of Chinatown Area as Sustainable Urban Heritage in The City of Manado. *PLANNING MALAYSIA*, 15.
- Ling, O. H. L., Marzukhi, M. A., Qi, J. K., & Mabahwi, N. A. (2020). Impact of urban land uses and activities on the ambient air quality in Klang Valley, Malaysia from 2014 to 2020. *Planning Malaysia*, 18.
- Li, A. (2022). Sharing historical districts under limitation: An acupuncture renewal design on a block in Hengshan Road-Fuxing Road urban conservation area (pp. 1423–1430). *University of Strathclyde Publishing*.
- Mahdianpoor, J., Taghavi Zavareh, M., & Saremi, H. (2019). Improving the Quality of Residential Neighborhoods using Urban Acupuncture Approach in Tajrish Neighborhood. *Motaleate Shahri*, 8(31), 31–44.
- Manouchehri, M., Rafieian, M., & Ranjbar, E. (2022). Application of Urban Acupuncture Approach in Prioritizing the Deteriorated and Historical Sites Case Study: Pamanar Neighborhood in Tehran. *Journal of Architecture and Urban Planning*, 14(34), 93–111.
- Othman, A. G., & Ali, K. H. (2020). Transportation and quality of life. *Planning Malaysia*, 18.

- Raoufi, R., & Shieh, A. (2023). Formulating Regeneration Strategies for the Historical Fabric of Sanandaj City by Applying an Urban Acupuncture Approach. *Urban Development*, 15(41).
- Roggema, R. (2020). Nature-driven urbanism (pp. 1-8). *Springer International Publishing*.
- Salman, K. A. H., & Hussein, S. H. (2021). Urban acupuncture as an approach for reviving. *IOP Conference Series: Earth and Environmental Science*, 779(1), 012031.
- Tousi, E., Sinou, M., & Perouli, A. (2022). Urban Acupuncture as a Method of Open Space Regeneration in Greek Ex-Refugee Areas. The Case of Nikea, Piraeus. *Journal of Sustainable Architecture and Civil Engineering*, 30(1), Article 1.
- Xueqiang, W., Ghani, M. Z. A., Yuan, G., Zaman, N. Q., & Sarkom, Y. (2023). Research on the spatial distribution of public service facilities in Nanchang old city, China based on point of interest (POI) data. *Planning Malaysia*, 21.
- Yang, M., Lanzinha, J. C. G., & Bao, X. (2021). Hydraulic and Civil Engineering Technology VI: *Proceedings of the 6th International Technical Conference on Frontiers of HCET 2021*. IOS Press.
- Yu, S. (2021). Hands over the city: Urban acupuncture for China 's informal community renewal [*Master thesis, Universitat Politècnica de Catalunya*].