

Challenges and outlooks of incremental historic urban district renovation in China – take Beijing Hutong Dongsinan case as an example

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Abstract

Incremental historic urban district renovation has emerged as a political consensus and trendy research field in China. However, intertwined challenges have made sustainable incremental renovation an increasingly demanding job. Evaluating incremental HUD renovation and exploring the potentials and limitations of such incremental approaches have become key topics in contemporary research. This paper proposes a theoretical and technical framework to evaluate HUD renovation processes and results regarding sustainability principles. With this framework, the paper evaluates the DSN quarter in Old Peking—one of the most representative cases of incremental urban renewal in China. Based on this evaluation, the paper identifies the key strengths, potentials and challenges of this emerging pattern, offering learnings towards sustainability for historic urban districts in and beyond Beijing Hutong.

Key words: Incremental historic urban district renovation; Beijing Hutong; evaluation; sustainability

1. Introduction

Incremental renovation, an urban renovation/redevelopment/renewal approach that “does not resort to wholesale demolition” and occurs without large-scale displacement (Shih, 2017; Wu, Zhang and Liu, 2022) derived from and defined by local entrepreneurial governance. However, changing state politics, in particular national political mandates, has not been adequately addressed. Through examining variegated practices, this paper understands how the changing national political context affects or redefines local redevelopment projects. These cases reflect local responses to the national campaigns for rural vitalisation and “Beautiful China”, heritage preservation and “incremental regeneration” (weigaizao, has been long considered as a scholarly consensus among urban planners and scholars in China as well as a recommendation for historic urban district (HUD) renewal. Wu Liangyong, one of the most influential figures in this discourse, created “organic renewal theory” based on the Ju'er Hutong renovation project in the inner Peking. Wu advocated for a metabolic renovation process to achieve “sustainable development,” applying different policies – such as conservation, demolition, etc. -- depending on the physical quality and the cultural significance of individual courtyards in HUDs. (Wu, 1994, pp. 63–69) Since the turn of 21st century, as China joined the WTO in 2000 and successfully bid for hosting the 2008 Olympics in 2001, the country has been further engaged in world industrial division and cultural exchange. Heritage conservation and cultural branding have been increasingly vital in the context of inner city renovation in China's urban development, especially in major metropolitan areas such as central Beijing (Tang and Zhang, 2021). In response, a growing number of scholars and local citizens have criticized the large-scale HUD demolition and replacement, once the “mainstream” mode of redevelopment since the late 20th century, for their adverse effects on urban conservation and social justice. (Fang, 2000) However, “dull-dozer redevelopment” remained to be in dominance in the 2000s driven by profit-oriented objectives under the joint control of local governments and real estate developers.

Incremental renovation became a widely-accepted political consensus (Ni, Zhang and Huang, 2017) and a popular trend (Wu, Zhang and Liu, 2022) derived from and defined by local entrepreneurial governance. However, changing state politics, in particular national political mandates, has not been adequately addressed. Through examining variegated practices, this paper understands how the changing national political context affects or redefines local redevelopment projects. These cases reflect local responses to the national campaigns for rural vitalisation and “Beautiful China”, heritage preservation and “incremental regeneration” (weigaizao in China in the early 2010s, especially in HUD renewals. The shift was largely driven by central government's strong will and commitment (Wu and Zhang, 2022) to heritage conservation and community construction as deepening the “all-round reform.” (China Daily, 2013) In addition to the top-down effort, the growing instability of the financial mechanisms underpinning large-scale “bulldozer” redevelopment programs further accelerated the transition toward incremental approaches in the late 2010s. Compared to bulldozer redevelopment, incremental HUD renovation with limited demolition and replacement, has been widely considered to be more sustainable

regarding economic, social, and cultural dimensions. It can contribute to preserving the spatial framework of the old city, the texture of the historic district, traditional architecture, traditional craftsmanship and customs, etc. (Ni, Zhang and Huang, 2017; Chen, 2021, p. 152; Wu, Zhang and Liu, 2022) derived from and defined by local entrepreneurial governance. However, changing state politics, in particular national political mandates, has not been adequately addressed. Through examining variegated practices, this paper understands how the changing national political context affects or redefines local redevelopment projects. These cases reflect local responses to the national campaigns for rural vitalisation and “Beautiful China”, heritage preservation and “incremental regeneration” (weigaizao). It can also help to maintain local social network and collective memory, enhancing residents’ sense of community belonging. (Chen, 2021, pp. 156–161; Wu, Zhang and Liu, 2022) “publisher”: “China Architecture & Building Press”, “publisher-place”: “Beijing”, “title”: “(The Research of Protection Renewal and Regeneration of Historic District: The Case of Three Blocks and Seven Alleys Historic District in Fuzhou) Moreover, incremental renovation allows for “flexible social capital investment influx” and helps to “avoid market risk” (Fang, 2000; Chen, 2021, pp. 165–166), making it a resilient strategy for sustainable urban regeneration.

This study focuses on incremental renovation in Chinese HUD renovation by raising up the following research questions: Can the incremental HUD renovation modes in China align with sustainability principles? What are the potentials and limits of the current incremental approaches? By evaluating a typical Beijing Hutong case -- Dongsinan (DSN) renovation -- against a sustainability-based framework, the study will offer reflections and recommendations on incremental HUD renovation practices in China. Section 2 will develop an evaluation framework grounded in sustainable principles. Section 3 will introduce the case site, outline the major challenges of Hutong development and conservation, and introduce the data collection methods. Section 4 will present the evaluation results, while Section 5 will provide reflections and discussions informed by the findings especially on the potentials and limits of the current incremental renovation mode.

2. Sustainability principles in incremental HUD renovation

2.1 Literature review on sustainability

“Sustainability” has emerged as a prominent global discourse in the 21st century. (Li, 2025) The concept highlights integrity across multiple dimensions, encompassing environment, social development, economy, and culture. (Strezov, Evans and Evans, 2017; Sabatini, 2019; Zhao, Zhao and Hui, 2021; Najjar, 2022; Li, 2025) comprising Change in Wealth Index (CWI) It also features both intergenerational and intragenerational “justice” among diverse actors. (Neugebauer, 2014, pp. 69–74) As urban heritage has been recognized among “central components” towards sustainable urban development (UNESCO, 2016, p. 22), understanding and interpreting “sustainability” principles in the HUD renovation contexts provide a basis for evaluating renovation cases and generating learnings from past experiences.

“Sustainability” in the HUD renovation refers to both sustainable processes and sustainable results. (Li, 2025) With regard to sustainable HUD renovation processes in response to the increasingly complex and intertwined challenges with uncertainties, a body of literature highlights the importance of a strategic approach. Such an approach highlights both integrity -- integrative vision, inclusive participation, and integrative governance and institution design – as well as adaptiveness, which requires both consistency and flexibility in the course of time and varying scenarios. An integrated and adaptive strategic thinking, offering “a set of concepts, procedures, and tools” towards fixed objectives or open visions (Wiechmann, 2007), can contribute to organising thinking, setting direction, focusing on effort, defining organization, providing consistency, and reducing ambiguity. (Mintzberg, Ahlstrand and Lampel, 2005, pp. 15–17) It can play a crucial role in addressing the complexities and uncertainties in HUD renovation. Carter and Roberts (2017, p. 50) identified a set of key features of a sustainable strategic approach drawing on extensive theoretical research on urban issues. They highlighted the importance of recognizing the inherent complexities involved, maintaining consistency of objectives under a long-term vision, and facilitating broad-based participation of both “bottom-up” and “top-down” interests throughout the entire process. They also underscored strategic adaptiveness, highlighting the need for creating a self-sustaining system open to ongoing adjustment and refinement, alongside regularly monitoring and evaluation. Other key principles included building consensus creation under a shared strategic vision as well as ensuring transparency in information dissemination. The HUL Guidebook (WHITRAP et al., 2016, p. 13) outlines a six-step methodology for strategy development, highlighting comprehensive survey and mapping, participatory planning for consensus building, integrated value and vulnerability assessment, action prioritization, and partnership establishment.

As HUD renovation has been increasingly incremental and emergent, strategic approaches are required to incorporate “embedded flexibility” (Van Karnenbeek and Janssen-Jansen, 2018) in response to the complex urban systems. Since the renovation results may be “provisional and contingent,” (Dovey, 2014) in recent decades emphasis has been turned to institutional design—or “the rules of the games” (North, 1990)—by a number of scholars, including D.A. Jelincic and Y. Mansfeld (2019) and Dovey (2014). In addition, an adaptive development model featuring “gradual adjustment of routines as a reaction to the dynamic environment” grow out of “collective learning” has been proposed in addition to the traditional linear, fully-formulated, and “from ends to means” strategy model (Wiechmann, 2007).

As for sustainable results, the expected and un-expected outputs, outcomes, and impacts of HUD renovation actions should be taken into account. A comprehensive understanding of sustainability in HUD renovations requires the integration of multiple dimensions—typically environmental, economic, social, and cultural. Scholars have developed a variety of multicriteria assessment methods and indicator systems to evaluate sustainability, either holistically (Neugebauer, 2014; Kou et al., 2018; Lin et al., 2021) or from specific disciplinary perspectives. There is also a growing body of literature on Impact Assessment (IA), such as Heritage Impact Assessment (Ashrafi, Neugebauer and Kloos, 2022), Environmental Impact Assessment (Glasson and Therivel, 2013), and Social Impact Assessment (Sairinen and Kumpulainen, 2006; Yung, Chan and Xu, 2014, 2015), providing detailed discussions and criteria for different (potential) impacts of the renovation efforts in ex-ante and/or ex-post contexts. All these studies contributes to a comprehensive understanding of how to describe, assess, and evaluate the multifaceted outcomes of HUD renovation projects.

2.2 Incremental HUD renovation evaluation framework on sustainability

Based on the literature view on “sustainability,” the study proposes an evaluation framework of both sustainable HUD renovation process and results. In evaluating the renovation process, sustainability is interpreted through four key dimensions: integrated vision, justice, adaptiveness, and robust institutional support. An integrated vision involves both integrative value interpretation and comprehensive strategic objective or direction setting. Justice mainly refers to the fair participation among different actors, especially the local communities and the experts since in China the party-state can always be in a dominant position in HUD related issues. Adaptiveness should also be highlighted in an incremental and emergent process in the course of time. Last but not least, robust institution design, or game rules design, such as resource allocation and negotiation system, can be essential for guiding ongoing, open-ended renovation efforts and achieving long-term strategic goals. With regard to the outcomes, a comprehensive assessment should consider the impacts across environmental, economic, social, and cultural dimensions. Figure 1 and Figure 2 list the key evaluation criteria derived from the literature, which will subsequently be applied to the case of the DSN Hutong renovation by evaluating to what extent the DSN case is in line with sustainability.

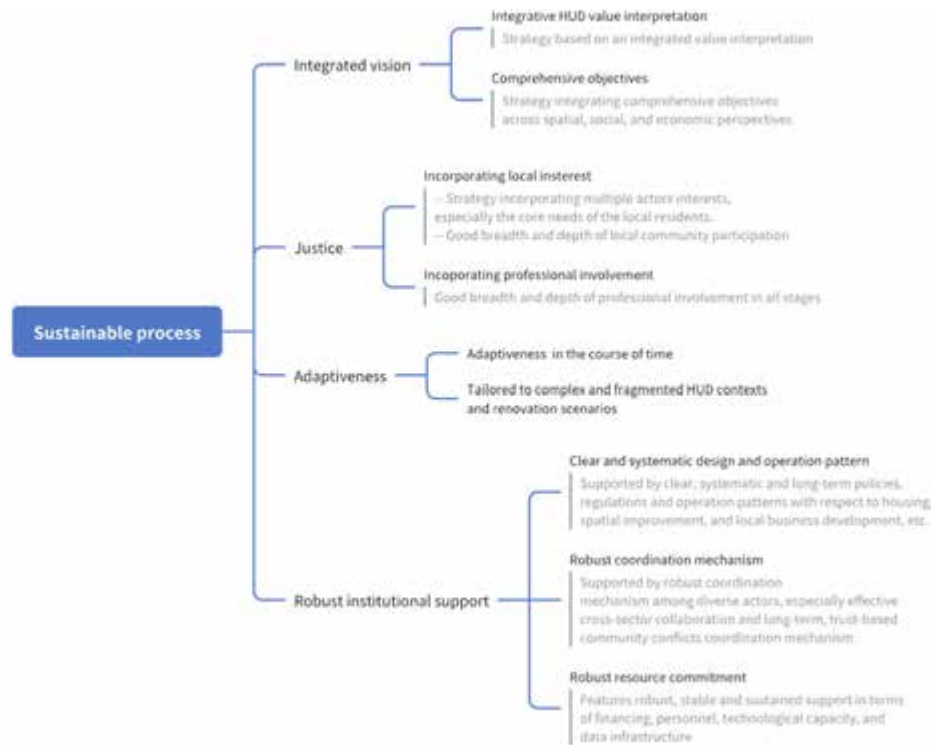


Figure 1: Criteria for sustainable processes (key reference: (Carter and Roberts, 2017; Li, 2025))

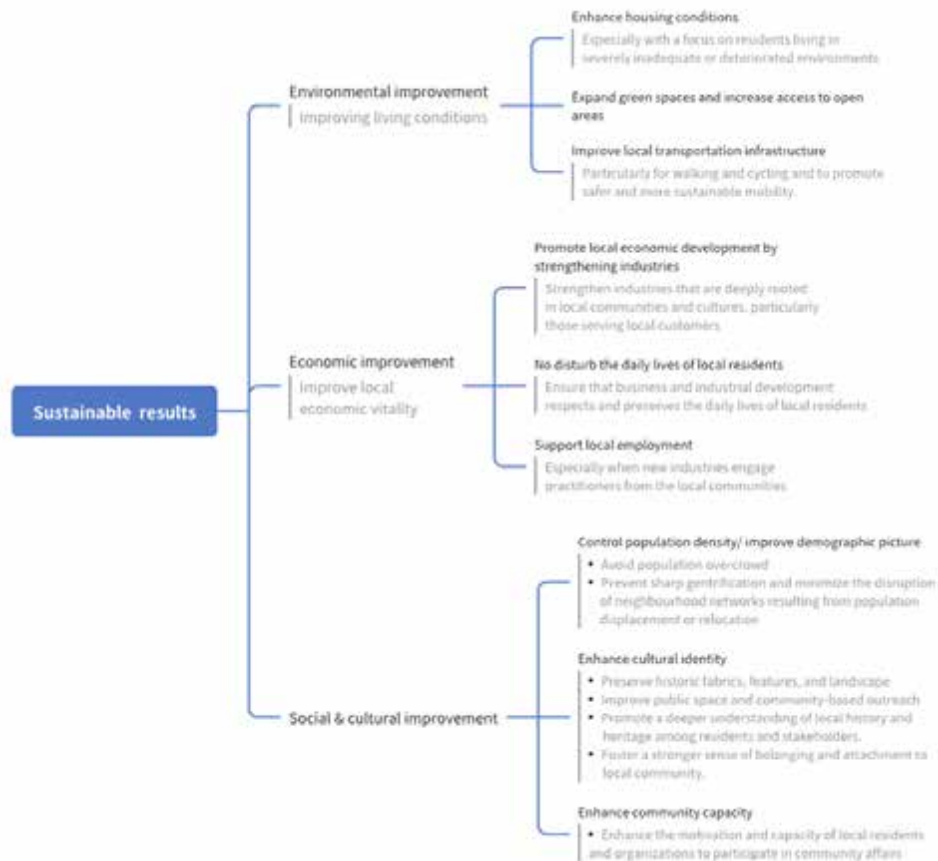


Figure 2: Criteria for sustainable results (key reference: (Neugebauer, 2014; Shi, Bian and Ge, 2015; Lin et al., 2021; Li, 2025))

3. Case study: DSN Quarter in Beijing Hutong

3.1 Key challenges for Hutong renovation

Beijing Hutong quarters are typically residential and commercial-residential HUDs in China, located in the central area of the city. These quarters feature a traditional spatial pattern of Hutong (narrow alleys) – siheyuan (courtyard houses). A Hutong (alley) refers to a narrow alley lined by the exterior facades of courtyard residences, while siheyuan, also known as a Chinese quadrangle, typically consists of inner yard enclosed by one-story houses. Historically, a single Siheyuan was often inhabited by an extended family; however, in contemporary times, these courtyards are usually shared by multiple households. Beijing Hutong quarters possess significant historical, social, and economic value. They exemplify traditional Chinese urban planning principles and embody the cultural philosophy of rites and order. However, in the recent decades, Beijing Hutong and its associated renovation efforts have faced a range of complex and pressing challenges.



Figure 3: Beijing Hutong (DSN Quarter), photoed in Nov 2023 (left) and June 2024 (right)

First, the Hutong quarters suffer from population-space conflicts. Accommodating a large population within spatially constrained environment has resulted in the limited living space, informal self-built additions within the yards, and encroachment on public and semi-public areas¹ with their personal items, which further undermines the historical spatial pattern and landscape, adds to the difficulties in improving local residents' living conditions, and may even exacerbate tensions among residents when competing for limited shared space. (BUT Research Team on Dashilar, 2019) Second, the Hutong quarters feature spatial and social fragmentation. There can be considerable differences among different courtyards in terms of property right management, courtyard neighbourhood relations, and households' willingness to engage in relocation or renovation processes in Hutong Quarters. (Shi, 2022, pp. 159–184) Therefore, a uniform approach or "one-size-fits-all" policy is unlikely to be effective. Renovation efforts need to take into account the diverse preferences and conditions of individual households featuring flexible and context-sensitive strategies tailored to different scenarios.

Third, the Hutong quarters remain insufficiently robust in terms of grassroots management. As the Danwei-allotment system in the planned economy time collapsed in the late 20th century, an institutional vacuum emerged regarding the grassroots management. Though local Neighbourhood Committees,² Street Offices³, and certain

¹ The "semi-public" space here mainly refers to the yard space inside the courtyards, usually shared by multiple families.

² Neighbourhood Committee is the fundamental local-based organization in urban China featuring a dual character of both residents' self-governance organization at the grassroots level and quasi-state administrative agency.

³ Street Offices, or "街道办" in Chinese, is the administrative agency of the district-level governments. They are always the lowest formal state governance agency in urban China.

local community organizations have taken on responsibilities in local management, grassroots management are still suffering from unclear delineations of rights and obligations among different actors, limited local resources and power, and authority fragmentation among sectors. The weak local management institution construction has posed challenges for effective community participation and interdisciplinary collaboration in HUD renovation processes.

Last but not the least, local Hutong communities have limited capacity for sustainable product production and consumption. It can be difficult for local residents, especially the underprivileged, to “generate their own blood.” In addition, due to the increasingly stringent control of commercial and tourism developments in HUDs in Beijing (BMBCT, 2021), the “rent gap” (Smith, 1979) in these areas has been reduced, limiting opportunities for economic revitalization and capital inflow into the Hutong quarter.

3.2 DSN Renovation

DSN Hutong quarter is located in the Dongcheng District of Central Beijing. It retains a historical spatial pattern of Hutong alley-courtyard, though now a single courtyard has often been shared by multiple families. Since the early 20th century, the quarter has attracted a number of educational and administrative institutions and has become a favoured residential and gathering place for prominent figures in literature, education, and modern science. (BMCPNR, 2021) The quarter spans around 1,24 km² and holds around 40, 000 long-term residents. (Chen, 2020, p. 29) Like many other Peking Hutong quarters or HUDs in China, DSN quarter faces intricated challenges towards sustainable development.

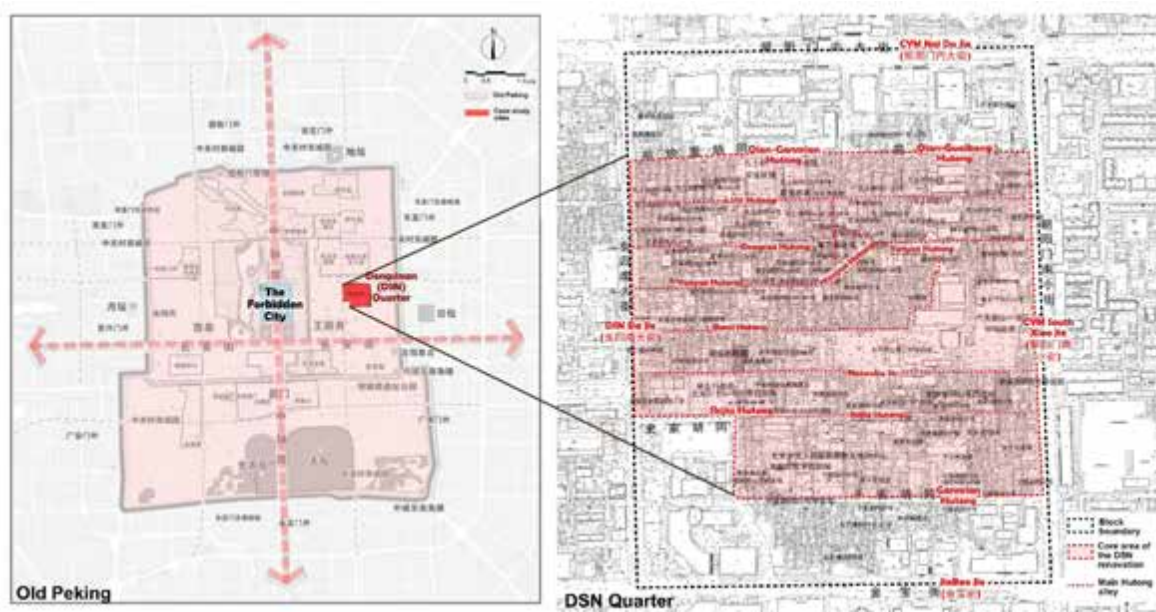


Figure 4: DSN quarter (base map of the left: (BMCPNR, 2018); base map of the right(BMCPNR, 2021))

DSN renovation is one of the most representative incremental HUD renovations in China. Initiated in 2010, it remains an ongoing process till today. Instead of following a linear trajectory, DSN renovation features open-ended development towards comprehensive community building and renovation. The renovation can be categorized into three phases: an incubation phase (2010–2013), characterized by tentative strategy-making through community workshops and the pilot renovation of Shijia Hutong Museum (SHM); a phase of institutional development (2014–2018), focused on community-based institutional construction and renovation efforts led by the Shijia Hutong Style and Feature Conservation Association (SHSFCA)⁴, a local organization established in 2014; and a phase of comprehensive exploration (2018–present), marked by the development of long-term responsible planner cooperation and the creation of a collaborative management platform, known as “DSN Platform” for short, DSN renovation come to a new period, featuring multiple series of cooperative across the Quarter.

⁴ SHSFCA is composed of local residents, property-right danwei, local party state members, experts from universities and planning institutes. (Feng et al., 2020, p. 3)

Up till now, DSN renovation has accumulated experience in developing local organization institution and has established several renovation patterns for incremental spatial improvements exemplified by round-by-round residential courtyard improvement, historic courtyard rehabilitation, and micro-public space renovation. Additionally, it also highlights cultural outreach and capacity building.

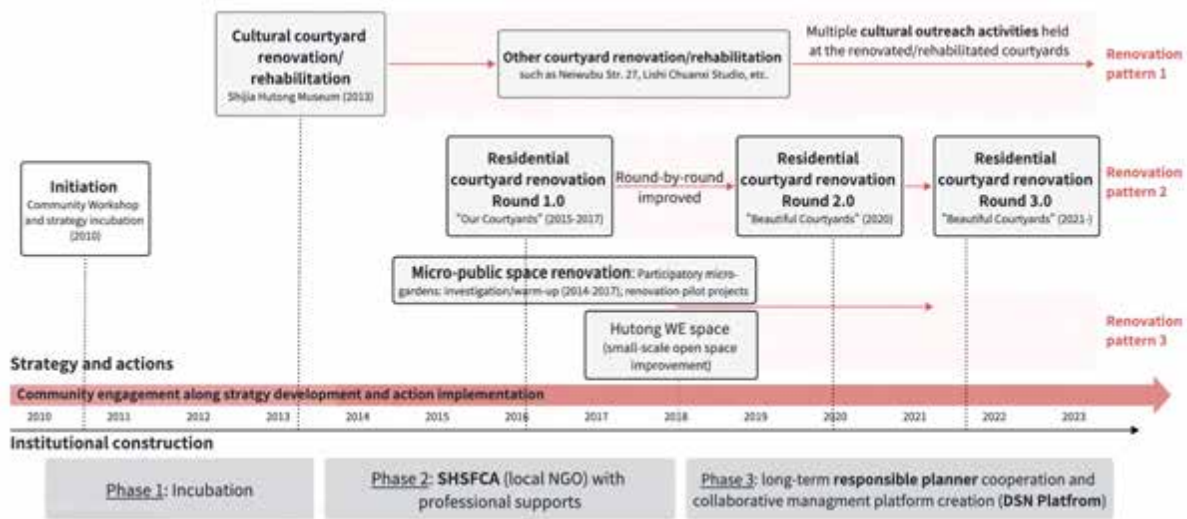


Figure 5: DSN renovation procedure (Li, 2025)

3.3 Data Collection

In order to assess and evaluate DSN renovation processes and results against sustainability, data were collected through three primary methods: (1) literature review; (2) direct field observation in the field trip; and (3) semi-structured interviews.

The literature review draws upon a wide range of sources, including governmental notices and documents, academic publications (books, journal articles, theses, etc.), community bulletins, newspapers, and official media outputs. Field observations were conducted during site visits to the DSN Quarter in November 2023 and June 2024, covering most of the public spaces within the HUD. During these visits, careful measures were taken to minimize the influence of the researcher's presence on the observed environment. Semi-structured interviews were conducted from November 2023 to June 2024 with a range of key stakeholders, including experts directly involved in the renovation process, members of local Neighbourhood Committees (NCs) representing the resident communities, and representatives of NGOs and guest performers engaged in community outreach. All interviewees were informed of the study's purpose in advance, and notes or audio recordings were made with their prior consent.

4. Results

Based on the literature review, field observations, and interviews, the study presents preliminary evaluation results referring to the framework and criteria on sustainable HUD renovation processes and results.

Table 1: Process evaluation of the DSN case

Criteria		Assessment and Evaluation
Integrated vision	Integrative HUD value interpretation	Mostly in conformity (For) The strategy is grounded in an integrated HUD value interpretation, especially the social and cultural values. (Against) However, there is still a long way to go to create "value consensus" and clear bottom lines among different actors.
	Comprehensive objectives	Fully in conformity (For) The strategy addresses multiple objectives regarding spatial, social and cultural perspective with a long-term vision.
Justice	Incorporating local interest	Partly in conformity (For) The renovation is relatively open to local <u>residents</u> engagement, especially compared with the non-incremental HUD renovation cases in China. (Against) The strategy can be limited regarding housing condition improvement, which is the residents' primary concern (Shi, 2022, p. 226) Resident participation mainly stay in the level of tokenism according the citizen participation ladder (Arnstein, 1969) and still limited in terms of genuine decision-making power.
	Incorporating professional involvement	Mostly in conformity (For) The renovation features "responsible planners" system and exhibits good depth and spectrum of professional participation in the entire process. (Against) The power and working scope of the responsible planners can be depended on the altitude of local street office.
Adaptiveness	Adaptiveness with consistency in the course of time: Tailored to diverse and complex renovation scenarios	Mostly in conformity (For) The strategy adopts an incremental, step-by-step approach, allowing for continuous adaptation based on feedback, thus balancing consistency with flexibility over time. The strategy features small steps at a time and tailored to the fragmented HUD courtyard contexts. The strategy features wide-range cooperation with third parties, enhancing its ability to respond effectively to different scenarios when coming across various challenges. (Against) Many of the incremental operation patterns remain experimental and vulnerable to uncertainties.

Robust institution support	Clear and systematic design and operation pattern	Partly in conformity (For) The renovation provides valuable explorations on institutional infrastructure design and game rules making regarding incremental small-scale actions supported by the local-based collaborative platform, exemplified by the round-by-round courtyard renovation pattern. (Against) Limited regulations and operation patterns have been developed regarding population and housing management and housing condition improvement, which is the core challenge and concern of the local community. The courtyard renovation operation pattern has still suffered from high transaction costs and lack of long-term maintenance
	Robust coordination mechanism	Partly in conformity (For) Creating the collaborative platform contributes to inter-sectoral and interdisciplinary cooperation, though the impacts have been gradual rather than transformative. Facilitating small-scale cooperation and consensus building in community activities or renovation actions as well as utilizing endogenous interpersonal structure and leadership to contribute to long-term trust-based community conflicts coordination mechanism. (Against) The coordination mechanism is not robust enough in the face of serious disputes, especially those involving core interests or occurring in courtyards without strong endogenous leadership.
	Robust resource commitment	Partly in conformity (For) Instead of relying solely on local government, the renovation draws on multiple resource sources and creates its resource pool to support renovation and community building. (Against) Current resource commitment <u>are</u> not stable and robust enough to provide continuous support for a broad range of initiatives.

Table 2: Result evaluation of the DSN case

Criteria		Assessment and Evaluation
Environmental improvement	Improving living conditions	Partly in conformity (For) Spatial improvements have been made in several courtyards through cultural outreach rehabilitation and round-by-round residential yard enhancement. Spatial improvements have been made regarding creating small public space and green space (Against) Only a limited number of courtyards have undergone renovation. No or limited improvement in housing conditions, (semi-)public space encroachment, and local walking, cycling, and parking system
Economic improvement	Improve local economic vitality	Partly in conformity (For) DSN has attracted a few self-sustainable organizations providing cultural and welfare-related services to local residents (Against) Limited improvements on local employment. An increasing influx of tourists has begun to disturb the everyday life of the local community

Social and cultural improvement	Control population density and improve demographic picture	No or limited in conformity No specific strategies or actions—either direct or indirect—addressing population density have been identified in the renovation plans
	Enhance cultural identity	Fully in conformity (For) Historic fabric and landscape conservation and rich community-based outreach activities have enhanced local heritage understanding and cultural identity.
	Enhance community capacity	Partly in conformity (For) Community activities and thematic seminars have created opportunities for some Hutong residents to develop a more open and proactive attitude toward local participation. The development of trust and emotional connections among local residents, on-site professionals, and NGO workers—alongside the accumulation of professional experience—has contributed to strengthening local community capacity. (Against) The depth and the scope of community participation as well as the capacity of local residents require further improvement.

5. Discussions

The evaluation results of the DSN renovation highlight both its potential and its challenges in terms of sustainability. One key advantage is that incremental HUD renovation like the DSN case allows for a long-term, gradually-improving strategy, fostering institutional design and the development of an operational model that balances consistency and adaptability. This approach is particularly valuable in addressing the growing complexities and uncertainties of current HUD renovation and instrumental in evolving institutional procedures from an experimental, easily initiated, and community-inclusive phase into a well-structured, mature framework. For instance, in the DSN case, the operational model for residential courtyard renovations has undergone three rounds of refinement. Improvements have been made regarding the establishment of the “pilot courtyard pool,” courtyard selection processes, collaborative design, and renovation plan confirmation, and the early experimental efforts of the Round 1.0 courtyard renovation in 2015–2016 have gradually evolved into a more structured and well-designed series by Round 3.0 in 2021. Furthermore, the DSN renovation case also suggests that in order to guarantee the long-term strategy with consistency, adaptiveness, integrity, it is important for the local authorities and professionals stay in an open mind and provide long-term commitment, as well as to create long-term local-based collaborative institutions alongside professional support systems.

In addition, the DSN case also indicates the great potential in social capital accumulation in the incremental HUD renovation process, which will reduce transaction cost in the negotiation and cooperation and benefit long-term spatial improvement and community capacity building. “Social capital” refers to resources embedded in “social network accessed and used by actor for actions” (Lin, 2001, p. 25) or “the good will that is engendered by the fabric of social relations and that can be mobilized to facilitate actions.” (Adler and Kwon, 2002, p. 23) The DSN case indicates that long-term local-based cooperation can enhance trust and emotional connection between the local residents and the community urban planners or the NGO workers and facilitate smoother collaboration. Moreover, it is also an important learning that we should not neglect endogenous structure and leadership shaped by the kinship, prestige, tenancy relationship, and long-term gaming among residents themselves. Supporting individuals with endogenous leadership roles can be important in facilitating cooperation and decision-making within the local community.

Apart from the advantages and potentials, incremental HUD renovation, as demonstrated in the DSN case study, also reveals limitations. In particular, this approach struggles to address situations involving severe conflicts of interest or the absence of endogenous leadership. In addition, the current DSN renovation does not touch one of the primary concerns of local residents: housing condition improvement. Critical issues such as expanding residential space and upgrading basic amenities (such as the kitchen facilities) remain insufficiently addressed, especially for underprivileged groups living in substandard conditions. Instead, it focuses more on semi-public and public spaces, such as shared courtyards and the open green space. Therefore, the DSN renovation falls short of tackling one of the fundamental challenges of sustainable HUD development -- managing population pressure within limited space -- and results in limited explorations regarding the housing policy studies, property right clarification, etc. It also means that the derivative issues of population-space conflicts -- such as the self-additions in the courtyards spoiling the historical landscape and the encroachment into the public areas, courtyards neighbours conflicts on using the limited shared space, etc. -- can hardly be adequately assessed. Further explorations are still required with respect to a more holistic and resident-centred approach and taking population pressure management and housing policy improvement into consideration, supported by strengthened resource support and institutional frameworks.

Based on the above discussion, Table 3 summarises the potential advantages and limits of incremental renovation models, as exemplified by the DSN case. In further cases, the table may serve as a useful tool for determining whether the incremental renovation approach is appropriate for specific contexts. It is also important to note that the analysis in Table 3 is situated within the specific context of China and may not be directly applicable to other settings. In the future, the incremental approach requires further enhancements on improving its local-based capacity in addressing more challenging residents concerns with party-state and third-party supports as well as community capacity building, especially with respect to population density control and housing conditions improvement.

Table 3 Limits and potentials of incremental renovation models exemplified by the DSN case

Well-suited to these conditions	Inappropriate for these conditions
- Not suffering from severe population pressure or critical housing condition issues - Featuring a certain degree of endogenous structure and emotional connection accumulation that favouring negotiation within the local community - Featuring a relatively strong potential for long-term collaborations with local experts and emotional connection - Facing limited political pressure to produce immediate, visible, and remarkable results	- Suffering from severe population pressure or critical housing condition issues - Featuring a poor degree of endogenous structure and emotional connection accumulation that favouring negotiation within the local community - Featuring a poor potential for long-term collaborations with local experts and emotional connection - Facing great political pressure to produce immediate, visible, and remarkable results

6. Conclusion

This study investigates the current exploration of incremental HUD renovation with a particular focus on its current strengths and weaknesses on sustainability. It develops a comprehensive evaluation framework on both sustainable HUD renovation processes and results based on literature review and applies this framework to assess and evaluate one of China's most representative cases—the DSN Quarter renovation in Beijing's Huang.

The case study and evaluation indicate the dual nature of incremental renovation at current stage in China: on one hand, it allows a long-term, gradually-improving strategy with consistency and adaptability and it demonstrates the potential for social capital accumulation, thereby reducing transaction costs in negotiation and collaboration over time. On the other hand, the findings also underscore existing challenges. Specifically, further exploration is needed to advance a more holistic and resident-centred approach that integrates population pressure management and housing policy reform. These insights may contribute to enhancing the sustainability of future incremental HUD renovation efforts.

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Reference

Adler, P.S. and Kwon, S.-W. (2002) 'Social Capital: Prospects for a New Concept', *Academy of Management Review*, 27(1), pp. 17–40. Available at: <https://doi.org/10.5465/amr.2002.5922314>.

Arnstein, S.R. (1969) 'A Ladder of Citizen Participation', *Journal of the American Institute of Planners*, 35(4), pp. 216–224. Available at: <https://doi.org/10.1080/01944366908977225>.

Ashrafi, B., Neugebauer, C. and Kloos, M. (2022) 'A Conceptual Framework for Heritage Impact Assessment: A Review and Perspective', *Sustainability*, 14(1), p. 27. Available at: <https://doi.org/10.3390/su14010027>.

BMBCT (2021) '“(14th Five-Year Plan for Cultural and Tourism Development in Beijing)”'. Available at: https://www.beijing.gov.cn/zhengce/zhengcefagui/202110/t20211025_2520206.html (Accessed: 11 December 2024).

BMCPNR (2018) '2016–2035(Beijing Urban Master Plan (2016-2035))'. Available at: <https://ghzrzyw.beijing.gov.cn/zhengwuxinxi/zxzt/bjcsztgh20162035/index.html> (Accessed: 5 December 2024).

BMCPNR (2021) (Planning Interpretation: Meet at Shijia Hutong to Continue a New Legend with Culture and Exchange). Available at: https://ghzrzyw.beijing.gov.cn/zhengwuxinxi/zxzt/wsgs/2021dyj/d5j/202102/t20210224_2288070.html (Accessed: 12 December 2024).

BUT Research Team on Dashilar (2019) '(The spatial turn of the relations between the neighbours in old blocks:the Dashilar, Beijing)', *International Social Science Journal(Chinese Edition)*, 36(01), pp. 27-43+5+9-10.

Carter, A. and Roberts, P. (2017) 'Strategy and Partnership in Urban Regeneration', in P. Roberts, H. Sykes, and R. Granger (eds) *Urban Regeneration*. 2nd edn. Los Angeles, London, New Delhi, Singapore, Washington DC, Melbourne: SAGE Publications. Available at: <https://doi.org/10.4135/9781473921788>.

Chen, Y. (2020) (Study on the Spatial Renovation of Hutong Node Space in Dongsu South District of Beijing). Master's thesis. Beijing University of Civil Engineering and Architecture.

Chen, Z. (2021) — (The Research of Protection Renewal and Regeneration of Historic District: The Case of Three Blocks and Seven Alleys Historic District in Fuzhou). Beijing: China Architecture & Building Press.

China Daily (2013) The Decision on Major Issues Concerning Comprehensively Deepening Reforms in brief- China.org.cn. Available at: http://www.china.org.cn/china/third_plenary_session/2013-11/16/content_30620736.htm (Accessed: 2 December 2024).

Dovey, K. (2014) 'Incremental Urbanism: The Emergence of Informal Settlements', in Emergent Urbanism. Routledge.

Fang, K. (2000) (An Appropriate Approach to Organic Renewal in the Residential Areas of Old Beijing). Doctoral thesis. Tsinghua University.

Feng, F. et al. (eds) (2020) (Rooting and Growing: Practices of the Responsible Planners in Beijing DSN historic urban district). Beijing: China Architecture & Building Press.

Glasson, J. and Therivel, R. (2013) Introduction To Environmental Impact Assessment. 4th edn. London: Routledge. Available at: <https://doi.org/10.4324/9781315881218>.

Jelinčić, D.A. and Mansfeld, Y. (2019) 'Applying Cultural Tourism in the Revitalisation and Enhancement of Cultural Heritage: An Integrative Approach', in M. Obad Šćitaroci, B. Bojanić Obad Šćitaroci, and A. Mrđa (eds) Cultural Urban Heritage: Development, Learning and Landscape Strategies. Cham: Springer International Publishing, pp. 35–43. Available at: https://doi.org/10.1007/978-3-030-10612-6_3.

Kou, H. et al. (2018) 'Conservation for Sustainable Development: The Sustainability Evaluation of the Xijie Historic District, Dujiangyan City, China', Sustainability, 10(12), p. 4645. Available at: <https://doi.org/10.3390/su10124645>.

Li, X. (2025) Towards sustainability: Reflections and Recommendations on Beijing Hutong Renovation. Doctoral thesis. RWTH Aachen University.

Lin, N. (2001) Social Capital: A Theory of Social Structure and Action. Cambridge: Cambridge University Press (Structural Analysis in the Social Sciences). Available at: <https://doi.org/10.1017/CB09780511815447>.

Lin, S.-H. et al. (2021) 'Evaluating the sustainability of urban renewal projects based on a model of hybrid multiple-attribute decision-making', Land Use Policy, 108, p. 105570. Available at: <https://doi.org/10.1016/j.landusepol.2021.105570>.

Mintzberg, H., Ahlstrand, B.W. and Lampel, J. (2005) Strategy safari: A guided tour through the wilds of strategic management. New York: Free Press. Available at: https://www.academia.edu/1895549/Strategy_safari_A_guided_tour_through_the_wilds_of_strategic_management (Accessed: 18 November 2024).

Najjar, R. (2022) 'Four dimensional spatial sustainability (4DSS): a revolutionary approach toward utopian sustainability', Discover Sustainability, 3(1), p. 21. Available at: <https://doi.org/10.1007/s43621-022-00090-x>.

Neugebauer, C.S. (2014) 'Ansätze perspektivischer Stadtentwicklung durch Inwertsetzung des UNESCO-Weltkulturerbestatus, untersucht in Städten peripherer und metropolere Räume'.

Ni, F., Zhang, Y. and Huang, H. (2017) '(Initial Research on the Implementation Method of Old City of Beijing Regeneration for Historic Cultural Cities Conservation)', Shanghai Urban Planning Review, (02), pp. 65–69.

North, D.C. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press (Political Economy of Institutions and Decisions). Available at: <https://doi.org/10.1017/CB09780511808678>.

Sabatini, F. (2019) 'Culture as Fourth Pillar of Sustainable Development: Perspectives for Integration, Paradigms of Action', *European Journal of Sustainable Development*, 8(3), pp. 31–31. Available at: <https://doi.org/10.14207/ejsd.2019.v8n3p31>.

Sairinen, R. and Kumpulainen, S. (2006) 'Assessing social impacts in urban waterfront regeneration', *Environmental Impact Assessment Review*, 26(1), pp. 120–135. Available at: <https://doi.org/10.1016/j.eiar.2005.05.003>.

Shi, Y. (2022) *Courtyard Society: Deviation and Regeneration of the Living Space in Beijing History Areas*. Beijing: Tsinghua University Publishing House.

Shi, Y., Bian, L. and Ge, T. (2015) '(Social space and living condition improvement-led historic residential district renewal-- Investigation and Analysis based on several historic quarters in Old Peking)', in(UPSC) (ed.) —201508 (New Normal: Heritage and Change -- Proceedings of the 2008 China Urban Planning Annual Conference (08 City culture)). Beijing: China Architecture & Building Press, pp. 682–692.

Shih, M. (2017) 'Rethinking displacement in peri-urban transformation in China', *Environment and Planning A: Economy and Space*, 49(2), pp. 389–406. Available at: <https://doi.org/10.1177/0308518X16670158>.

Smith, N. (1979) 'Toward a Theory of Gentrification A Back to the City Movement by Capital, not People', *Journal of the American Planning Association*, 45(4), pp. 538–548. Available at: <https://doi.org/10.1080/01944367908977002>.

Strezov, V., Evans, A. and Evans, T.J. (2017) 'Assessment of the Economic, Social and Environmental Dimensions of the Indicators for Sustainable Development', *Sustainable Development*, 25(3), pp. 242–253. Available at: <https://doi.org/10.1002/sd.1649>.

Tang, Y. and Zhang, L. (2021) '(Institutional Exploration and Policy Optimization of Block Regeneration in Beijing)', (04), pp. 28–35.

UNESCO (2016) *Culture: urban future; global report on culture for sustainable urban development; summary* - UNESCO Digital Library. Paris: UNESCO. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000246291> (Accessed: 4 December 2024).

Van Kernenbeek, L. and Janssen-Jansen, L. (2018) 'Playing by the rules? Analysing incremental urban developments', *Land Use Policy*, 72, pp. 402–409. Available at: <https://doi.org/10.1016/j.landusepol.2017.12.021>.

WHITRAP et al. (2016) *The HUL Guidebook: Managing heritage in dynamic and constantly changing urban environments*. Project report. Shanghai: WHITRAP, pp. 30–33. Available at: <http://historicurbanlandscape.com/themes/196/userfiles/download/2016/6/7/wirey5prpznidqx.pdf> (Accessed: 28 August 2024).

Wiechmann, T. (2007) 'Planning and Adaptation -Strategising in Complex Contexts as Dealing with Social Paradoxes', in *New Concepts and Approaches for Urban and Regional Policy and Planning*. New Concepts and Approaches for Urban and Regional Policy and Planning, Leuven.

Wu, F. and Zhang, F. (2022) 'Rethinking China's urban governance: The role of the state in neighbourhoods, cities and regions', *Progress in Human Geography*, 46(3), pp. 775–797. Available at: <https://doi.org/10.1177/03091325211062171>.

Wu, F., Zhang, F. and Liu, Y. (2022) 'Beyond Growth Machine Politics: Understanding State Politics and National Political Mandates in China's Urban Redevelopment', *Antipode*, 54(2), pp. 608–628. Available at: <https://doi.org/10.1111/anti.12781>.

Wu, L. (1994) *The old city of Beijing and its Juer Hutong neighbourhood* (Chinese Title:). Beijing: China Architecture & Building Press.

Yung, E.H.K., Chan, E.H.W. and Xu, Y. (2014) 'Sustainable Development and the Rehabilitation of a Historic Urban District – Social Sustainability in the Case of Tianzifang in Shanghai', *Sustainable Development*, 22(2), pp. 95–112. Available at: <https://doi.org/10.1002/sd.534>.

Yung, E.H.K., Chan, E.H.W. and Xu, Y. (2015) 'Assessing the social impact of revitalising historic buildings on urban renewal: the case of a local participatory mechanism', *Journal of Design Research*, 13(2), pp. 125–149. Available at: <https://doi.org/10.1504/JDR.2015.069755>.

Zhao, R., Zhao, X. and Hui, X. (2021) '——'(Traditional Courtyard Public Space Improvement from the perspective of cultivating self-governance capabilities -- take "Beautiful Courtyard" practice in Beijing Dongcheng District as an example)', *Beijing Planning Review*, (S1), pp. 86–93.

Abbreviations

BMBCT: Beijing Municipal Bureau of Culture and Tourism

BMCPNR: Beijing Municipal Commission of Planning and Natural Resources

BUT: Beijing University of Technology

HUL: Historic Urban Landscape

SHSFCA: Shijia Hutong Style and Feature Conservation Association

UNESCO: United Nations Educational, Scientific and Cultural Organization

WHITRAP: World Heritage Institute of Training and Research for the Asia and the Pacific Region under the auspices of UNESCO