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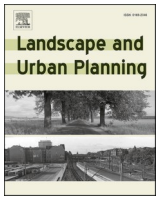

Critical factors for effective resident participation in neighborhood rehabilitation in Wuhan, China: From the perspectives of diverse stakeholders

Yu Li [a,*], Yinhua Tao [b], Queena K. Qian [a], Erwin Mlecnik [a], Henk J. Visscher [a]

[a] Faculty of Architecture and the Built Environment, Delft University of Technology, Julianalaan 134, Delft 2628BL, The Netherlands
[b] MRC Epidemiology Unit, University of Cambridge, Cambridge CB2 0QQ, The United Kingdom

HIGHLIGHTS:

- Financial Incentive is the most critical factor for resident participation.
- *Information Transparency* and *Trust* are also paramount factors.
- Experienced stakeholders emphasize *Trait and Capacity* and *Participant Education*.
- COVID-19 and rehabilitation reshape stakeholder perception of critical factors.
- The Neighborhood Committee stands pivotal in organizing resident participation.

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ABSTRACT

Resident participation is essential for neighborhood rehabilitation. It requires the active involvement of residents and efficient management by organizers. To improve the effectiveness of resident participation, it is necessary to understand the critical success factors (CSFs) underlying it. However, previous research has examined the critical factors from a single-stakeholder perspective, overlooking potential differences in perceptions among stakeholders with diverse roles and rehabilitation experiences. Based on 30 interviews and 255 questionnaires from six stakeholder groups in Wuhan, China, this study explores how the perception of critical factors for effective resident participation varies among local government, community-based organization, designer, contractor, consulting party, and resident. Thirty-seven factors were identified and compared among the stakeholders. Financial Incentive (for participation organizers) was identified as the most critical factor for effective resident participation, followed by Information Disclosure and Transparency, and Trust. Results from the analysis of variance (ANOVA) show that the six groups differed significantly in the importance of most factors (25/37), especially in Participant Education and Prejudice against the Working Group. Interview results indicate that the COVID-19 pandemic and rehabilitation experience changed stakeholders' perceived importance of some factors. Specifically, in future RP initiatives, extra emphasis could be placed on Trait and Capacity (of the working group) and Participation-assistance Technologies. Stakeholders regarded these two factors as more critical as their rehabilitation experience accumulated. By understanding stakeholders' conflicting and changing perceptions of effective resident participation, suggestions were proposed to each stakeholder group to fulfill their distinct participation objectives and improve the overall effectiveness of participation practices.

1. Introduction

Rehabilitation is emerging as a prevalent paradigm for urban renewal efforts after witnessing the gentrification and displacement brought about by brutal demolition and reconstruction. (Jagarajan et al., 2017; Nixon et al., 2023). In the process of urban rehabilitation, the residential neighborhood is often considered the most modifiable geographic scale (Pérez et al., 2018). Unlike the knock-down-and-

* Corresponding author.
E-mail addresses: Y.Li-30@tudelft.nl (Y. Li), yh.tao@hotmail.com (Y. Tao), K.Qian@tudelft.nl (Q.K. Qian), E.Mlecnik@tudelft.nl (E. Mlecnik), H.J.Visscher@tudelft.nl (H.J. Visscher).

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rebuild approach for redevelopment, neighborhood rehabilitation is the restoration and enhancement of residential buildings, infrastructure, and communal environment (Ma et al., 2023). Beyond significantly improving the living environment, neighborhood rehabilitation also supports the continued residence of local inhabitants. This, in turn, contributes to the preservation and transmission of local collective memories and social networks (Ma et al., 2023; Nixon et al., 2023). Notably, with a growing appeal for social sustainability and reconstruction of citizenship, neighborhood rehabilitation is changing from a top-down economic stimulus to a bottom-up social movement, thereby advocating resident participation (Fors et al., 2019; Puskás et al., 2021).

For neighborhood rehabilitation, resident participation (RP) is *any process that involves neighborhood residents in problem-identifying, decision-making, and issue-solving to enable public input to be manifested in rehabilitation decisions and outcomes* (IAP2, n.d.). Besides offering economic and environmental benefits, RP also holds significant value in generating lasting and meaningful social impacts. As Beierle and Cayford (2002) concluded, "…*involving the public not only frequently produces decisions that are responsive to public values and substantively robust, but it also helps to resolve conflict, build trust, and educate and inform the public about the environment*." Given these benefits, countries and regions are incorporating participation initiatives into renewal policies, such as the Housing and Community Development Act in the U.S., New Deals for Communities in the U.K., Big Cities Policy in the Netherlands, and Co-Creation for Better Environment and Well-being in China. These updated policies aim to promote not only economically viable, environmentally sound, but also socially acceptable urban renewal and environmental management.

However, participation practice is not always effective in fulfilling its good intentions. In some cases, it can even exacerbate problems, such as project delays and reversals, inefficient technology operations, diminished trust in government, and heightened social tensions (Petts, 1999; Uittenbroek et al., 2019). To ensure intended benefits, scholars shift the research focus from 'why' to 'how', exploring the prerequisites and feasible ways for effective RP. In the last two decades, participation studies have investigated the connotation of effective participation (Del Furia and Wallace-Jones, 2000; Rowe et al., 2004), the appropriate design of participation (Bobbio, 2019; Uittenbroek et al., 2019), the influencing factors and impact paths (Brown et al., 2016; Li et al., 2020a), and the interactive methods for more accessible participation (Brown et al., 2018). Established studies focus on the single stakeholder of government or the public, leaving the impact of other stakeholder groups understudied. For urban renewal, other stakeholders, including community-based organizations, designers, constructors, and consulting parties, may also play a major role (Arnstein, 1969; Fahmi et al., 2016; Uittenbroek et al., 2019). They hold resources, power and competence that enable them to carry out neighborhood rehabilitation and even call off any unnecessary actions, such as resident participation (Freeman, 1984).

Another issue is the criteria for qualifying effective RP in urban renewal (Rowe and Frewer, 2000; Webler et al., 2001). This is particularly the case in less developed areas, characterized by a brief renewal history and a nascent interest in resident participation. In China, for example, urban redevelopment and rehabilitation often fail to account for variations in RP objectives and degrees, influenced by specific project characteristics, including size, environmental and social sensitivities (Liu et al., 2018b). Stakeholders, due to their diverse roles and experiences, may also hold different perspectives on effective RP (Li et al., 2020a; Liu et al., 2018a). Additionally, since the outbreak of COVID-19, many new challenges appear in evaluating stakeholders' perceptions of critical factors for RP. This relates to changes in underlying power structure across stakeholder groups, such as government levels and the relationships between community workers and residents (Liu et al., 2021). These power changes may further alter stakeholders' views on factors like transparency, justice, and trust (Han et al., 2023; Liu et al., 2023; Tao et al., 2021), thereby their perceived importance of these factors for effective RP. For these considerations, an updated assessment of stakeholder perspectives in the post-pandemic context is imperative to ensure effective RP in neighborhood rehabilitation.

Against the backdrop of the post-pandemic society, this study aims to identify critical factors for effective RP by comparing the perceptions among six major stakeholder groups. Specifically, the research intends to address the following four questions:

1) What are the objectives for stakeholders to involve residents in neighborhood rehabilitation?
2) What are the critical factors of effective resident participation?
3) How do stakeholder groups differ in their perceptions of critical factors?
4) How does the perception of critical factors evolve as stakeholders become more experienced in neighborhood rehabilitation?

2. Literature Review

2.1. Effective resident participation

Despite challenges in defining effective RP, scholars have been striving to differentiate effective and ineffective practices using various criteria. Arnstein (1969)'s *Ladder of Citizen Participation* stands out in this regard, emphasizing that genuine public participation involves empowering the "have-nots" in influencing planning decisions. Other theoretical criteria, such as transparency, fairness, and equality are frequently used as proxies to gauge effectiveness (Bobbio, 2019; Niitamo, 2021; Tao et al., 2021). Meanwhile, a significant number of scholars prioritize the practical aspects of RP, delineating its effectiveness based on the process or outcome features. Effective RP often showcases a broad public representation, inclusion of vulnerable minorities, high frequency, diversified measures, early involvement, and cost-efficiency (Liu et al., 2018b; Orchowska, 2019; Uittenbroek et al., 2019). However, these approaches tend to treat evaluators as homogeneous, overlooking the varying perceptions that stem from their different social roles and experiences. In this regard, Rowe et al. (2004) provide a more nuanced perspective: "…*it may have variable success on the different criteria within any one (RP) framework*." This perspective recognizes the differences in subjective perceptions among evaluators. An effective participatory activity is the one that *fulfills the objectives of all involved parties*.

For the effectiveness of RP, it is essential to start with the question of what stakeholders intend to achieve by involving residents. Based on the established observations (Arnstein, 1969; Creighton, 2005; Uittenbroek et al., 2019) and Glucker et al. (2013)'s precise and concise classification, this study identifies eleven objectives of RP (Table 1), backed by three underlying rationales: normative, substantive and instrumental rationales. Normative rationale pertains to the ethical, moral, or philosophical underpinnings of participation. Substantive rationale centers on the material objectives directly related to the content and outcomes of RP, whereas instrumental rationale perceives RP as an instrumental tool, emphasizing its practical impacts and efficiency.

As Rowe et al. (2004) point out, stakeholders may have divergent objectives for a single RP approach, leading to varying perceptions of its effectiveness. For instance, during neighborhood rehabilitation, local governments often collaborate with consultants to hold neighborhood meetings with residents to brainstorm improvement strategies, such as the renovation plan for the parking shed. Governments aim to resolve resident conflicts and enhance credibility, while consultants focus on equipping residents with design and legal knowledge for effective presentation of ideas and negotiation. Although the civic skills of residents are improved, these meetings may not address the interests of tenants and violators of unauthorized building work (UBWs), potentially exacerbating conflicts between them and homeowners and eroding government credibility. This leads to a differing image of RP effectiveness: Consultants might see the neighborhood meeting as a success, whereas

Table 1
RP Objectives (Adapted from Glucker et al. (2013)).

Objectives	Implications for neighborhood rehabilitation
Normative rationale	
Empowerment	To empower residents to influence rehabilitation decisions and results.
Develop citizenship	To equip residents with citizen skills (e.g., critical thinking, problem-solving, collaboration, teamwork) and the testing ground to exercise the skills.
Neighborhood development	To enhance neighborhood cohesion and residents' attachment, similarity, and interdependence with others, promoting their commitment to neighborhood issues.
Substantive rationale	
Reach consensus	To reach a consensus among residents, and between residents and non-resident stakeholders on whether, what, and how to rehabilitate the neighborhood.
Minimize cost and delay	To avoid unnecessary shutdown and turnover.
Easier implementation	To give residents a sense of ownership of rehabilitation decisions and to motivate their assistance and enthusiasm in implementation.
Reasoning	To make residents acknowledge the reasons behind decisions and plans.
Leverage local information and knowledge	To harvest residents' environmentally and socially relevant information and knowledge; and empirical and value-based knowledge specific to the neighborhood.
Identify expectation and concern	To make the work group sensitive to residents' requirements and predict residents' behaviors.
Instrumental rationale	
Generate credibility and legitimacy	To legitimate the decision-making process and decision, build up the credibility of non-resident stakeholders and rehabilitation projects among the residents.
Avoid confrontation and conflict	To circular residents' interests and concerns for conflict prevention, identification, reduction, and resolution.

government officials may perceive it as less effective due to increased confrontations.

Additionally, specific approaches for RP are relevant to the objectives set by stakeholders. For instance, in the flood management project in Kockengen, Netherlands, the government held workshops for collaborative brainstorming between residents and experts (leverage local knowledge), with updates communicated via newspapers and a site office established to ease tensions (avoid conflict) (Uittenbroek et al., 2019). In Luo et al. (2020)'s case of Wuhan, China, the RP activities were designed and organized by a local NGO. They applied roadshows, surveys, and workshops to acknowledge residents' expectations, followed by thematic training sessions for child volunteers (develop citizenship). Interestingly, in both cases of Kockengen and Wuhan, similar RP strategies produced divergent objectives and outcomes among stakeholders. Kockengen's residents perceived the RP process as ineffective due to a lack of integration of their feedback into final designs. In contrast, Wuhan's approach enhanced residents' planning knowledge and resolved conflicts between homeowners and tenants, thereby resulting in more satisfying RP experiences.

2.2. Influencing factors for effective resident participation

According to Rockart (1979), critical success factors (CSFs) for effective RP are *the few key areas in which results, if they are satisfactory, will ensure effective RP*. Compared to new construction, the renovation project, especially neighborhood rehabilitation, is one of the riskiest, most complex, and uncertain projects to manage. This arises from the involvement of residents with diverse and often conflicting interests, making it challenging to strike a balance between them and effectively manage the project. Consequently, identifying CSFs is crucial for stakeholders. Recent studies list CSFs to improve public participation in various construction-related fields, including community settlement (Serrao-Neumann et al., 2015), heritage rehabilitation (Benedjma and Mahimoud, 2020), sustainable energy projects (Liu et al., 2018a), and urban redevelopment (Liu et al., 2018b). For urban redevelopment, residents are involved in determining compensation plans, which requires focused but singular participation. However, since residents are the end-users of neighborhood rehabilitation, their participation is anticipated throughout the process, necessitating consistent and ongoing involvement. The specificity of neighborhood rehabilitation requires examining CSFs for a more extended period after incorporating the views of diverse stakeholders involved in the rehabilitation project.

Moreover, the implementation of RP is specific to the region and neighborhood with unique contexts and traditions. Uslaner and Badescu (2004)'s comparative analysis of Western and Eastern Europe reveals how the form of government and its stability can influence citizen participation. Citizens in countries with a longstanding democratic tradition often exhibit greater proactivity in public affairs (Uslaner and Badescu, 2004). The political environment also shapes local social customs and culture. A case in point is that Chinese citizens are less willing to participate than their Western counterparts, given the influence of Confucianism, top-down policies, and the legacy of a planned economy (Li et al., 2012). Residents from neighborhoods with close social networks and participation traditions are more active in neighborhood affairs (Pradhananga and Davenport, 2017). Notably, the prolonged government-led lockdowns during the COVID-19 pandemic have prompted shifts in political strategies, administrative structures, and societal norms in Chinese cities, which could significantly impact the implementation of RP and neighborhood rehabilitation. In light of these studies, three contextual factors are identified as crucial for effective RP: *Policy environment*, *Administrative environment*, and *Socio-cultural environment*.

Besides the context-related factors, cognitive factors can also shape residents' participation decisions (Dekker and Van Kempen, 2008; Plummer and Taylor, 2013). Established studies identify four cognitive factors: 1) *Previous experience*, refers to residents' perceptions built from their prior participation experience. Pleasant past experiences can motivate residents to stay involved (Brown et al., 2016); 2) *Practical constraints*, refer to the hassles the residents perceive for participation. Lack of money, space, and time may hesitate potential participants (Aitken, 2017; Fors et al., 2019); 3) *Perceived benefits*, refer to foreseeable advantages from RP, including increased income, comfort, and convenience, acting as a driver for RP (Aitken, 2017); and 4) *Consistency with self-identity*, refers to the extent to which the rehabilitation measure is consistent with residents' wishes, identity and personal values. As the consistency increases, residents are more likely to engage in participation (Fors et al., 2019).

Equally important as the residents, the organizers bear significant responsibility for effective RP. Organizer-related factors are collectively referred to as Leadership and team organization, encompassing three aspects: 1) *Trait and capacity*. Organizers who possess traits like charisma, accountability, and vitality can build deep emotional connections, thus establishing leadership with the residents (Fahmi et al., 2016; Purdue, 2001). Especially under the circumstance of an emergency (e.g., the COVID-19 pandemic), organizers with leadership are more effective in mobilizing and convincing residents to participate (e.g., cooperation with the lockdown policy) (Blofield et al., 2020). Capacity refers to the organizer's expertise and skills, including goal-setting, problem-solving, resource-building, and networking. 2) *Attitude*. Friendly, helpful, and courteous attitudes can alleviate residents' doubts about participation (Brown et al., 2016). 3) *Credibility* is the general image of organizers. Low credibility can expel certain social groups. For example, Lowndes et al. (2001)'s policy census in the U.K. shows that the diminished credibility of local governments led to the deliberate disengagement of single mothers in the renewal programmes.

Building upon these studies, we come to an initial list of influencing factors for effective RP (Table 2), including: A. External environment; B. Project benefit and impact; C. Participation scheme and approach; D. Resource and support; E. Information and communication; F. Power distribution and relationship; G. Leadership and team organization; H. Local perceptions and expectation.

2.3. Neighborhood rehabilitation and resident participation in China

The term neighborhood (*Juzhuqu*) in China is *a district with clear geographical boundaries where the primary purpose of land use is housing*. Those constructed before 2000 are often referred to as old neighborhoods (*Laojiuxiaoqu*) and are the focus of recent rehabilitation initiatives (SC, 2020). Given extensive socio-political benefits, local governments remain the initiator and the primary financier of neighborhood rehabilitation. Government-initiated neighborhood rehabilitation mainly aims to: 1) restore building structures and façades; 2) improve the communal environment and facilities; and 3) boost resident participation and grassroots governance (Tang et al., 2022). The *Symposium on the Pilot Programme of Old Neighborhood Rehabilitation* in 2017 marked the inception of the RP concept in China's planning domain, which is now articulated as Co-Creation (*Gongtong Dizao*) in policy frameworks. To achieve the Co-Creation, established policies outline the responsibilities and roles of involved parties. Besides residents, there are five stakeholder groups for RP in China (SC, 2020): Local government, Community-based organization, Planning and design professional, Implementation and construction unit, and Consulting party.

Residents play a tripartite role in neighborhood rehabilitation, that is, 1) investment, 2) decision-making, and 3) reflection. Participation via investment entails residents sharing costs, dedicating time and effort to monitoring construction activities, demolishing UBWs and maintenance (Li et al., 2020b). Like practices in various countries, decision-making is the crux of RP in China's neighborhood rehabilitation. Here, residents have a say in determining: 1) the need for rehabilitation, 2) rehabilitation scope and content, 3) design plan and technology, 4) order and content of construction, and 5) management mode and responsible entities (SC, 2020). Reflection participation encourages residents to provide feedback on stakeholders, decision-making process, operational progression, and outcomes.

Local governments in China are structured into three tiers: Municipality, District governments, and Sub-district administrative offices. The municipality is tasked with formulating rehabilitation regulations and technical standards, and devising regional rehabilitation strategies (SC, 2020). For neighborhood rehabilitation, the district government holds a higher decision-making power than the municipality and sub-district administrations (Zhuang et al., 2019). They oversee the rehabilitation process and determine the initiation of the rehabilitation programme. The district government is also in charge of securing and allocating funds, approving projects, and selecting and vetting stakeholders, such as designers, constructors, and consultants (Lu and Lange, 2021). Sub-district administrative offices focus on implementation, offering training and oversight to community-based organizations (Zhao et al., 2023). Despite having less decision-making power compared to municipal and district governments in rehabilitation, these offices are responsible for allocating funds, staff, and venues for RP implementation, making them highly relevant to the practical aspects of RP initiatives (Li et al., 2020b; Liu et al., 2023).

In China, community-based organizations primarily consist of Neighborhood Committees (*Juweihui*) and Homeowner Committees (*Yeweihui*). These entities function as mass autonomous organizations, facilitating residents' self-management, self-education, and self-service. Unlike the Homeowner Committee, which exclusively consists of neighborhood homeowners, the lead and members of the Neighborhood Committee are often non-local residents. They are sponsored and empowered by local government (Liu et al., 2023). In neighborhood rehabilitation, the Homeowner Committee is responsible for collecting and harmonizing views within the residents, as well as communicating and negotiating such opinions with the Neighborhood Committee (Lu and Lange, 2021). The neighborhood committee, on the other hand, acts as the information broker, communicating the latest policies to residents and making the residents heard to the outside world (Li et al., 2020b; Liu et al., 2023). It also has the task of coordinating and organizing RP to defend residents' interests and power against external stakeholders (Wu et al., 2019; Zhao et al., 2023; Zhuang et al., 2019). Their commonly used RP approaches include information campaigns, neighborhood meetings, thematic gatherings, and private dialogues with residents (Liu et al., 2023).

Designers, implementers, and constructors are responsible for the design and construction processes of neighborhood rehabilitation. Sometimes, they act as surveyors for gathering residents' demands and concerns through door-to-door campaigns, interviews, and questionnaire surveys (Luo et al., 2020; Zhu, 2023). Consulting parties, including research institutes, NGOs, and media, provide expert insights to facilitate a smooth rehabilitation process or impactful RP. Led by the consulting parties, a variety of participatory models are experimented in China, such as collaborative workshop in Guangzhou (Li et al., 2020d), co-governance in Wuhan (Luo et al., 2020), and participatory planning in Xiamen (Hui et al., 2021). Consultants in these cities often assume multifaceted roles, such as aggregating resources and information, creating participation platforms, recruiting and training participants, suggesting solutions, and even engaging in policymaking (Li et al., 2020b; Li et al., 2020d; Zhao et al., 2023).

3. Methodology

This study followed an iterative analysis process where prior research questions and findings shaped the approach to the subsequent research question. Subsequently, results were synthesized narratively to identify the critical factors that influence effective RP. This provided insights into the significance of these factors for each stakeholder group and explored the reasons for consensus and disagreement among stakeholder groups. As Fig. 1 illustrates, the research began with semi-structured interviews to validate the objective list and the initial factor list in the context of urban China (Research Question, RQ 1). Then, the pilot interview findings directed the design of questionnaire surveys and interviews of stakeholder groups. This step investigated stakeholders' RP objectives and the importance level of influencing factors for effective RP (RQ 2). Third, the analysis of mixed data was conducted to rank the factors and narrative of the similarities and discrepancies in stakeholders' perceptions of critical factors (RQs 3 and 4). Finally, suggestions were proposed to each group based on the results from the four research questions and groups' specific role in neighborhood rehabilitation.

3.1. Case selection

This study selected Wuhan, China, as the case area (Fig. 2). Between 2020 and 2023, Wuhan has successfully rehabilitated 1,318 old neighborhoods (Fig. 2). The city's journey in RP began in 2008, with RP becoming an institutionalized aspect of its policies by 2020. The abundance of rehabilitation projects and the rich diversity in RP practices provide researchers with a wealth of cases for detailed examination. More importantly, Wuhan represents an intriguing case to study RP considering its relevance to other cities in developing countries as well as developed cities and regions.

In China, while first-tier cities exert significant domestic and global influence, second-tier cities like Wuhan often face more significant challenges with a larger volume of aging neighborhoods and a more extensive urban population. Despite this, current research on urban renewal and RP largely centers on first-tier cities, leaving the experiences of less-developed areas underrepresented. Given the distinct economic, administrative, and social contexts of these regions, insights

Table 2
Influencing factors for effective RP in neighborhood rehabilitation.

Component	Cd.	Factors	Description	Source
A. External environment	A1	Policy environment	Laws, regulations and policy mechanisms that are currently in force.	(Uslaner and Badescu, 2004; Webler et al., 2001)
	A2	Administration environment	Institutional structure and bureaucratic procedures that are currently in force.	(Magigi and Majani, 2006; Webler and Tuler, 2006)
	A3	Socio-cultural environment	Beliefs, norms, customs and values that are prevailing in the area.	(Fors et al., 2019; Li et al., 2012; Pradhananga and Davenport, 2017)
B. Project benefit and impact	B1	Appearance change	Changes in the appearance of residential buildings and neighborhood public spaces.	(Brown et al., 2016; Liu et al., 2018a)
	B2	Economic impact	Job creation, new revenue, changes in real estate value, etc.	(Liu et al., 2018a)
	B3	Environmental and ecology impact	Influence on safety, health, natural environment, and ecosystems.	(Brown et al., 2016)
	B4	Socio-cultural impact	Influence on local beliefs, norms, customs and values.	(Aitken, 2017)
C. Participation scheme and approach	C1	Goal setting	Clearly defined and agreed RP goals.	(Dickens, 2013)
	C2	Task allocation	Roles and tasks are allocated based on residents' characteristics.	(Liu et al., 2018b)
	C3	Participation timing	Earlier involvement of residents and continuity of RP.	(Orchowska, 2019; Uittenbroek et al., 2019)
	C4	Participation approach	Diverse, specific and appropriate RP methods are used, e.g., polling, survey, exhibition, briefing, workshop, visit demonstration project.	(Uittenbroek et al., 2019)
	C5	Participant representativeness	Participants cover a wide range of traditional, marginalized and disadvantaged residents.	(Liu et al., 2018b)
D. Resource and support	D1	Financial incentives	Financial support for organizing RP.	(Dekker and Van Kempen, 2008)
	D2	Rewards and punishments	Rewards, compensations or even punishments to motivate residents to participate.	(Geidne et al., 2012)
	D3	Equipment and infrastructure	Venues, equipment, materials necessary for RP.	(Liu et al., 2018b)
	D4	Human inputs	Staffing, knowledge and services from external experts attributed to diverse disciplines and skillsets.	(Benedjma and Mahimoud, 2020; Boyle and Michell, 2020)
	D5	Participation-assistance technologies	Technologies and services developed for easier and better RP, e.g., more accessible smartphone applications, VR, and AR.	(Brown et al., 2018; Urbanowicz and Nyka, 2016; Li et al., 2020c)
	D6	Participant education	Education and training for raising RP awareness, knowledge, and skills among residents.	(Dekker and Van Kempen, 2008)
	D7	Time allowance	Time set aside specifically for RP.	(Webler et al., 2001)
E. Information and communication	E1	Information disclosure and transparency	Complete and transparent disclosure of information, and timely responses to resident inquiries.	(Bobbio, 2019; Orchowska, 2019)
	E2	Intra-group communication	Stable and honest communication between actors working in the same organization.	(Boyle and Michell, 2020)
	E3	Inter-group communication	Stable and honest communication between actors working for different organizations.	(Webler and Tuler, 2006; Webler et al., 2001)
	E4	Evaluation criteria	Criteria established for evaluating RP.	(Serrao-Neumann et al., 2015)
F. Power distribution and relationship	F1	Trust	Degree of reciprocal commitment and trust between residents and other stakeholders.	(Boyle and Michell, 2020; Dickens, 2013)
	F2	Empowerment	The level of power devolved to the residents to affect rehabilitation.	(Arnstein, 1969)
	F3	Equity and justice	Residents in different conditions and from various backgrounds have equal rights in RP.	(Dickens, 2013; Niitamo, 2021; Tao et al., 2021)
G. Leadership and team organization	G1	Traits and capacity	Personal traits and capacity to successfully carry out RP.	(Blofield et al., 2020; Fahmi et al., 2016; Purdue, 2001)
	G2	Attitude	Recognize and embrace resident input and the value of RP.	(Niitamo, 2021; Uittenbroek et al., 2019)
	G3	Credibility	General perception and image of stakeholders.	(Aitken, 2017; Serrao-Neumann et al., 2015)
H. Local perceptions and expectations	H1	Prejudice against the working group	Residents' grievances or unpleasant experiences against certain members of stakeholders.	Interview with CP 1
	H2	Previous experience	Perceptions residents built from their previous experience in RP, e.g., hard/easy, laboring/effortless.	(Dickens, 2013; Uittenbroek et al., 2019)
	H3	Perceived constraints	Practical constraints perceived by the residents, e.g., lack of money, space and time.	(Dekker and Van Kempen, 2008; Plummer and Taylor, 2013)
	H4	Perceived benefits	Personal benefits from RP perceived by the residents, e.g., monetary gain, convenience, comfort, and safety.	(Benedjma and Mahimoud, 2020)
	H5	Consistency with self-identity	The extent to which the rehabilitation is consistent with residents' wishes, identity, and personal values.	(Aitken, 2017; Brown et al., 2016)
	H6	Participation-related knowledge and skills	Resident's skills and knowledge about participation, e.g., articulation, negotiation and confidence.	(Plummer and Taylor, 2013; Serrao-Neumann et al., 2015)

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Table 2 (*continued*)

Component	Cd.	Factors	Description	Source
	H7	Community attachment	The extent to which residents are socially and mentally connected to the neighborhood.	(Benedjma and Mahimoud, 2020; Dekker and Van Kempen, 2008)
	H8	Resident characteristics	Attributes of residents, e.g., gender, age, education level, type of residence, occupation, etc.	(Brown et al., 2016; Fahmi et al., 2016)

from developed cities may not be directly applicable. Wuhan, as a typical second-tier city, is crucial for providing a more representative understanding of neighborhood rehabilitation and RP in China's developing areas. Insights from Wuhan are instrumental for calibrating and contextualizing findings from developed regions and offering lessons for other developing cities navigating similar challenges.

Besides, local governments in second-tier cities like Wuhan typically grapple with financial constraints. The COVID-19 pandemic further exacerbates these challenges for Wuhan, leading to marked financial pressures stemming from central government budget reductions, decreased local fiscal revenues, personnel shortfalls, and heightened service demands. Such fiscal austerity mirrors the trends witnessed in Western countries following the 2008 economic crisis. Given this parallel fiscal context, observations from Wuhan can offer a nuanced understanding of Western countries navigating persistent fiscal challenges.

3.2. Study area

In 2008, Wuhan first introduced public participation through a public poll on the renewal of Hongshan Square. Although the public voiced their preference for renovation, the government proceeded with its initial redevelopment plan. This "pseudo-participation" resulted in a trust crisis for the municipality and public skepticism toward participation (Legaldaily, 2008). Recognizing the need for enhanced resident engagement in urban development, Wuhan Municipal Bureau of Natural Resources and Planning (WMBNRP), in collaboration with Wuhan Urban Planning Research Institute, introduced the *Public Planning Wuhan* platform (https://www.wpdi.cn/project-5-i_11322.htm) in 2015. This digital platform offers up-to-date planning information to citizens, encouraging active public participation through avenues like plan voting and incentivized surveys. From 2017 to 2019, Wuhan revisited its RP strategies within the context of neighborhood micro-renewal. Gleaning insights from this pilot, the WMBNRP partnered with local design entities and research institutes and unveiled the *Guidelines for the Micro Reconstruction Planning of Communities in Wuhan*, proposing recommendations on the scope, measures, and degree of RP (WBNRP, 2021).

In June 2020, Wuhan formulated the standardized procedure for neighborhood rehabilitation programme. RP therefore became an integral and institutionalized aspect of Wuhan's rehabilitation initiatives. In this procedure, a questionnaire survey among residents of aging neighborhoods is a prerequisite before launching rehabilitation projects

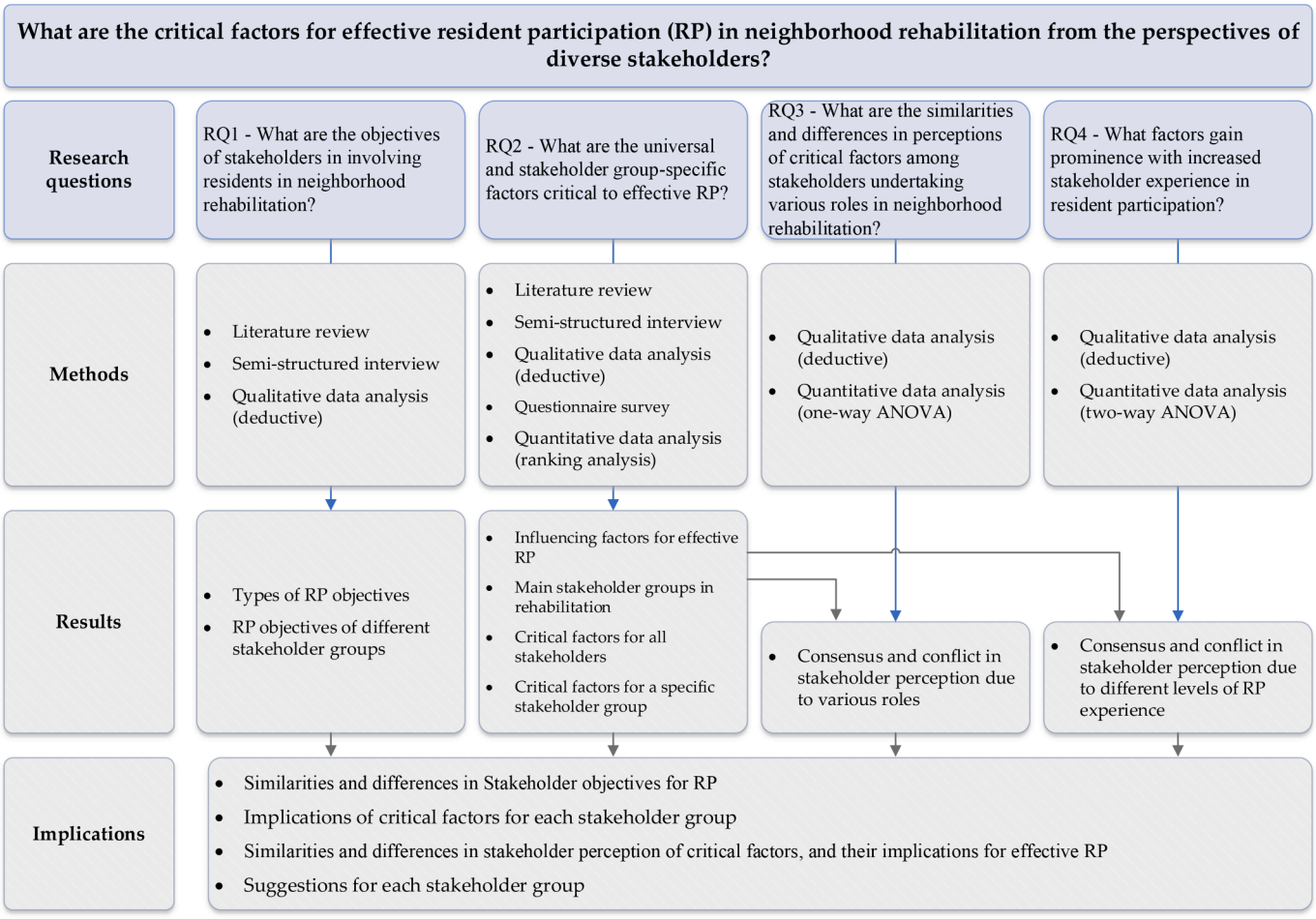

Fig.1. Overview of the Research Process.

(MW, 2020). Eligibility for rehabilitation requires a minimum resident participation rate of 80 % and two-thirds of agreement from participated residents (HBHURD, 2018). The rehabilitation and design plans must be publicly displayed for a minimum of five days, allowing for public inquiries and potential modifications. Additionally, these plans can only proceed to the construction phase if they receive approval from a specified percentage of the resident community (HBHURD, 2018). Participation and approval of resident representatives are essential for project acceptance. Their satisfaction with RP is a crucial metric of the program evaluation (HBHURD, 2018; MW, 2020). In 2021, the WMBNRP introduced the *Neighborhood Responsible Planner* programme, encouraging volunteer engagement in grassroots administrative support. Residents can also participate via informal channels, such as contacting the *Mayor's Hotline* or sharing their RP experiences on social media. Fig. 3 overviews the timeline for RP and the associated policies in Wuhan.

3.3. Data collection

3.3.1. Semi-structured interview

Interviews with different stakeholders were conducted to tailor the initial factor list to the context of urban China. Government, community-based organization, and constructor interviewees were reached through publicly accessible project information (such as phone numbers, email addresses, organization names, and contact personnel). Designers and consultants were accessed via snowball sampling through the key informants. Residents were randomly approached in the rehabilitated neighborhoods. Participants were included in the analysis if they 1) aligned with one of the identified six stakeholder groups; 2) possessed experience in neighborhood rehabilitation; and 3) interacted with residents directly in neighborhood rehabilitation. Consequently, 30 interviewees were recruited, including 6 government officials, 4 community-based organization directors, 4 designers, 4 construction professionals, 5 consultant representatives, and 7 residents. Appendix A details the interviewee profiles.

During the interviews, participants were prompted to: 1) name influencing factors for effective RP; 2) evaluate and justify the significance of each factor; and 3) elucidate factors using examples. Between April 15 and June 3, 2022, one of the authors conducted face-to-face interviews, each of which lasted between 45 and 60 min. From the interview with a local university professor (consulting party, CP 1), a new factor not included in the original factor list emerged. It was labeled *Prejudice against the working group* (H1), stemming from residents' adverse personal experiences with team members. Consequently, a finalized list of 37 influential factors was compiled (Table 2). The interview protocol was reviewed and approved by the Human Research Ethics Committee (HERC) of the authors' institution. All interviews were recorded, noted, and transcribed with the interviewees' agreement.

3.3.2. Questionnaire survey

Based on the factor list aggregated from semi-structured interviews, this study designed the questionnaire with two sections. The first section was for non-resident stakeholders, investigating their roles and working experience in neighborhood rehabilitation, and their top three objectives for RP. The second section was for all six stakeholder groups, incorporating 37 items in the final factor list (Table 2). These survey items were measured on a 5-point Likert scale, ranging from 1 (extremely unimportant) to 5 (extremely important). Four trap questions were strategically interspersed throughout the questionnaire to discern respondents who might answer carelessly. Besides, the questionnaire questions were reviewed and refined by ten experts specialized in neighborhood rehabilitation and RP, and later received an endorsement from the HERC.

The questionnaires were sent in print and digital versions based on the stakeholder groups. For residents, paper questionnaires were randomly handed out in the rehabilitated neighborhoods in the

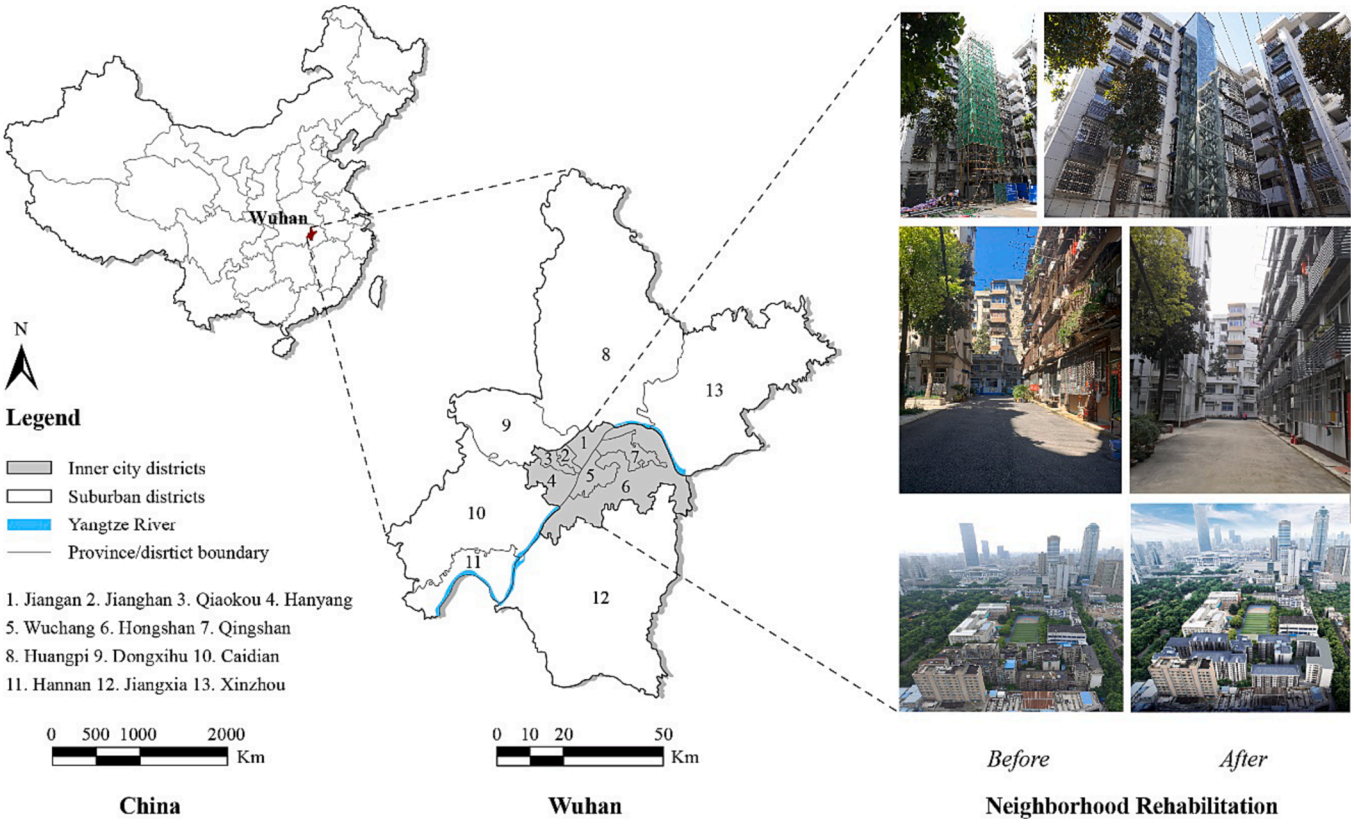

Fig. 2. Location of Wuhan (Left) and an Example of Neighborhood Rehabilitation Programme (right) (Source: authors and interviewees).

following hours when residents often spend time in the neighborhoods: weekdays from 5 pm to 9 pm, and weekends from 9 am to 9 pm. The digital questionnaires were disseminated with the help of Neighborhood Committees. For other stakeholders, the print and digital questionnaires were first delivered to the key informants and then circulated within their respective networks. The platform for filling out the digital questionnaires is *Wenjuan* (https://www.wenjuan.com/), a widely used anonymous questionnaire platform in China.

Between June 24 and August 15, 2022, 144 paper-based and 263 digital questionnaires were filled and returned. Due to inadequate completion time (under 5 min) or incorrect answers to the trap questions, 152 questionnaires were discarded. This resulted in 255 valid questionnaires used in this study (validity rate 62.7 %, 255/407).

As Table 3 shows, there was a roughly even distribution of the six stakeholder groups in the research sample: 33 respondents originated from government officials, 35 from community-based organizations, 48 from planners/designers, 52 from implementers/constructors, 33 from consultants, and 54 from residents. Besides, most respondents had 1–3 years of rehabilitation experience. This result aligns with the progress of neighborhood rehabilitation practice in Wuhan, where all government-led neighborhood programs commenced in June 2020. As a result, the studied respondents did not have a long-term rehabilitation experience during the data collection in June-August 2022. Even so, about 58.9 % (99/168) had participated in 2–5 rehabilitation projects, indicating their active involvement. Notably, 93.9 % (31/33) of government respondents had less than three years of rehabilitation experience, while 48.5 % (16/33) took part in over 20 projects, reflecting their supervisory role in neighborhood rehabilitation.

3.4. Data analysis

Before analyzing the data, we used Cronbach's alpha to evaluate the reliability of the questionnaire's factor section. Cronbach's alpha is a reliability coefficient in measuring the internal consistency of a set of survey items, that is, 37 items of potential critical factors for effective RP in this study. The result shows a score of 0.928, suggesting a high internal consistency among the 37 influencing factors (Nunnally, 1978).

Interview data were processed in ATLAS.ti, a widely used qualitative data analysis software. A deductive content analysis was conducted. We first developed a structured categorization matrix, encompassing three principal themes: 1) stakeholder groups; 2) objectives for RP; and 3) the final factor list (Appendix B, Table B1). The interview data were then reviewed and coded to check correspondences or examples to the identified categories (Appendix B, Table B2).

Questionnaire data were analyzed in the Statistical Package for Social Sciences (SPSS) version 28.0.1.1. The Analysis of Variance (ANOVA) was used to assess the differences in mean values among stakeholder groups (Fisher, 1970). Specifically, a one-way ANOVA evaluated the perception of critical factors by each stakeholder group (RQ 3). Then, a two-way ANOVA, considering both stakeholder roles and rehabilitation experience, was conducted to explore whether rehabilitation experience and the interaction between roles and experience were significantly associated with stakeholder perception of critical factors (RQ 4).

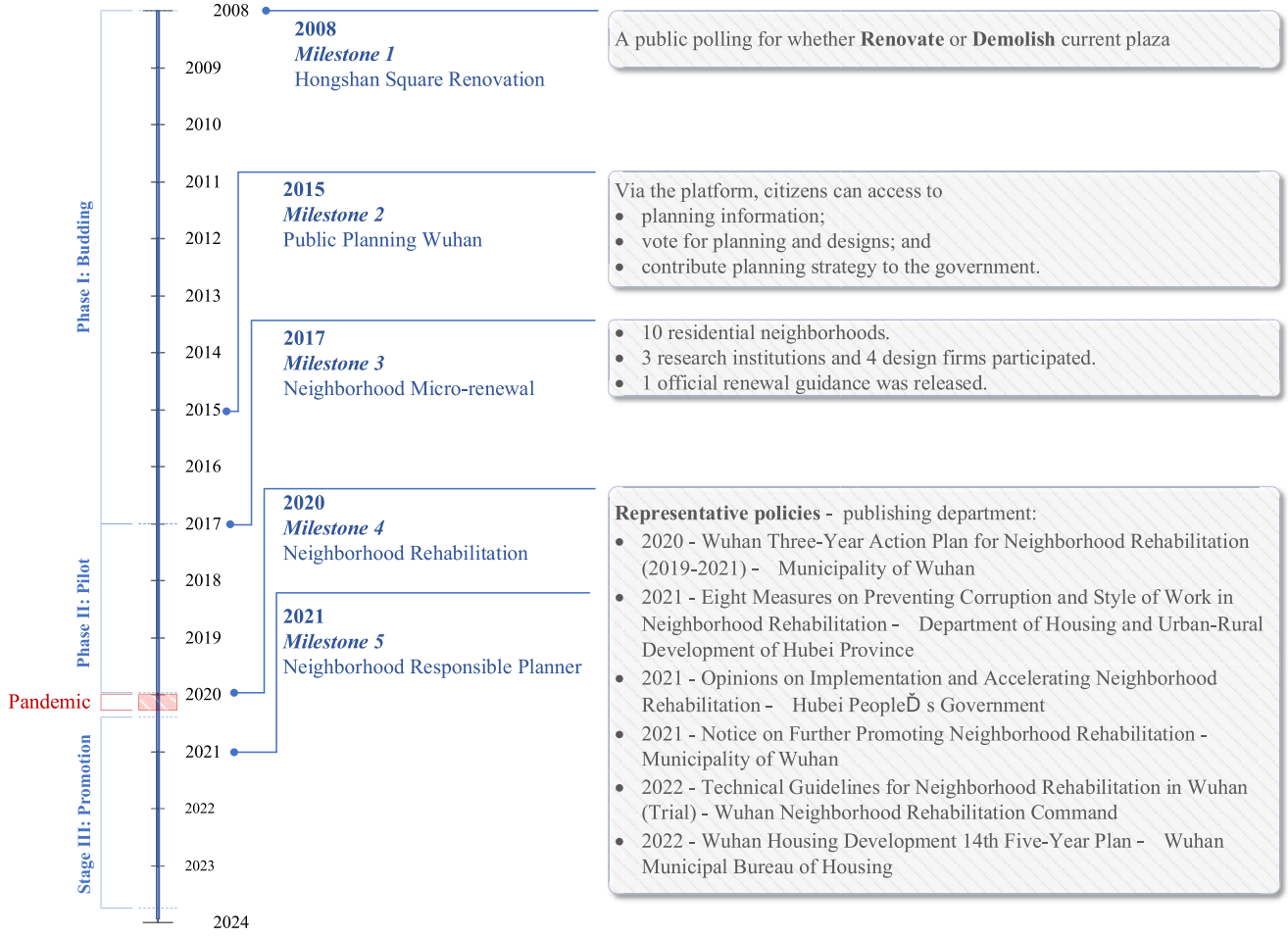

Fig. 3. The Timeline Roadmap of Resident Participation in Wuhan's Urban Renewal.

4. Results

4.1. Objectives for resident participation

As Fig. 4 shows, in general, stakeholders involved residents in reaching a consensus, identifying residents' needs and concerns, and generating the legitimacy and credibility of the decisions. Few stakeholder groups considered RP a chance to increase residents' influence over the decisions or equip residents with citizen skills. Specifically, local government, community-based organizations, and consulting parties were concerned about consensus reaching the most:

'*…elders in our neighborhood asked for a place to hang out. My first thought was to set up a hearing, to see whether other residents agree on it*'. (community-based organization, CO 1, interview, April 21, 2022).

As for designers and contractors, their primary goals were to acknowledge residents' needs and concerns and to smooth implementation, respectively. This is reasonable considering their primary roles in neighborhood rehabilitation: developing qualified designs and completing construction within the given timeframe.

'*…we sweet-talked the residents and gave them little gifts, just wishing they could let us do the construction… and it did work! With the residents' assistance, we cut the roadwork by a month*'. (implementation and construction unit, DC 3, interview, May 15, 2022).

4.2. Critical factors for effective resident participation

To identify the critical factors, the mean scores of each influencing factor were calculated and ranked as a whole, and by each stakeholder group. The left segment of Fig. 5 presents the general ranking, and the right illustrates the ranking specific to each stakeholder group. For data results, please refer to Appendix C.

4.2.1. General ranking

The survey results indicate that respondents regarded all 37 identified factors as significant, the lowest of which had a mean score of 3.13 (where 3 signifies neutral importance). Notably, five factors are critically important for efficient RP in neighborhood rehabilitation:

1# *Financial incentive* (mean score = 4.13; 45.1 % of the respondents rated it 5-extremely important).

2# *Information disclosure and transparency* (4.11; 41.2 %).

3# *Trust* (4.10; 39.6 %).

4# *Rewards and punishments* (4.06; 41.2 %).

5# *Credibility of the working group* (4.02; 31.0 %).

4.2.2. Local government

Government respondents regarded nearly all factors as significant (≥3.21), except for D5 (*participant-assistance technology*, 2.85). E1 (*Information disclosure and transparency*, 4.09) was rated as the most influential, followed by B1 (*Appearance change*, 4.06) and E2 (*Intra-group communication*, 3.94). This accords with the government practices in setting up special governmental sections for public participation. These sections take charge of disseminating RP information by multiple channels:

'*…every level of government has established its specialized department. Residents can visit in person, through mail, and phone calls. We have also set up official accounts on social platforms like WeChat, Weibo, and TikTok, where we post the latest policies, collect residents' feedback, and respond to their comments.*' (local government, LG 2, interview, June 3, 2022).

However, government interviewees also expressed their concerns about the communication cost between various governmental departments and the hierarchical levels within the administrative system (E2):

'*…for this sub-district office, the person in charge of resident affairs keeps changing. They have three different heads this year alone, which is really annoying. Every time there is a change, I have to go over the district's requirements all over again.*' (LG 4, interview, May 10, 2022).

4.2.3. Community-based organization

Community workers regarded all 37 factors as significant (≥3.29).

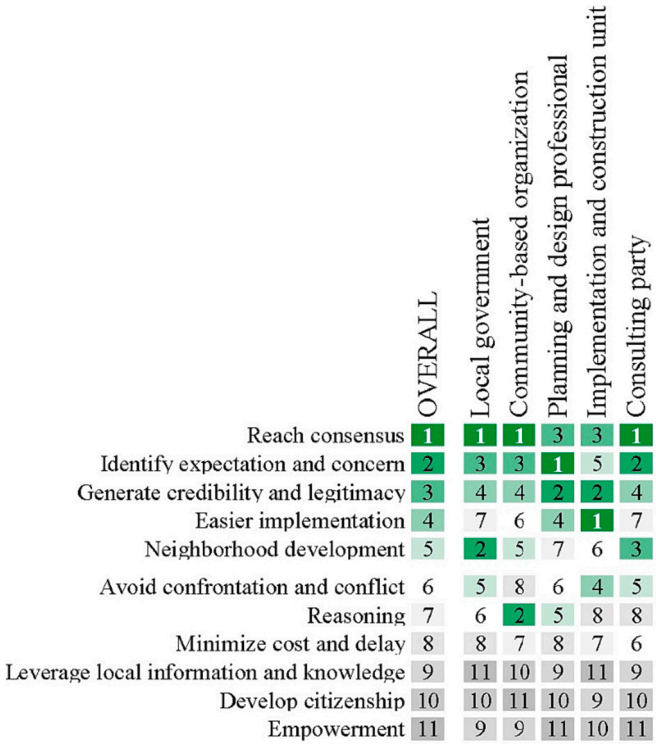

Fig. 4. Ranking of RP Objectives.

Table 3
Sample characteristics.

		Local government	Community-based organization	Planning and design professional	Implementation and construction unit	Consulting party	Neighborhood resident
Years in neighborhood rehabilitation	<1	14	7	11	8	8	–
	1–3	17	21	22	36	23	–
	4–6	2	3	10	7	1	–
	7–9	0	2	2	0	0	–
	>10	0	2	3	1	1	–
Number of rehabilitation projects	1	6	17	10	11	8	–
	2–5	6	14	30	31	24	–
	6–10	3	4	3	8	0	–
	11–15	2	0	0	0	0	–
	>20	16	0	5	2	1	–
Total	Frequency	33	35	48	52	33	54

Note: Residents' work experience was not collected.

The three most important factors were D1 (*Financial incentive*, 4.31), D3 (*Equipment and infrastructure*, 4.17), and E3 (*Inter-group communication*, 4.14). For D1, 82.9 % of respondents assigned a score exceeding 4, and 80.0 % rated a score of 4 or 5 to D3. This underscores the influence of monetary and material resources on effective RP:

'*…we only had the 'open market' once and ran out of money. We had no venues to host it either. After the construction started, neighborhood open spaces were all covered with building materials. It is like when you are renovating your house – it is a total mess, with no space to entertain guests at all!*' (CO 2, interview, April 22, 2022).

Additionally, the COVID-19 pandemic made the local government more cautious in allocating administrative funds because of their tighter fiscal budgets:

'*…after COVID-19, the government's finances are not as abundant as before… every single penny and every transaction is scrutinized very strictly… when residents come, I can give them a bottle of water. But handing out a bar of soap? That is absolutely not allowed.*' (CO 3, interview, April 22, 2022).

4.2.4. Planning and design professional

Designers identified D1 (*Financial incentive*, 4.02) and E1 (*Information disclosure and transparency*, 3.96) as the two most critical factors. Also, they suggested that residents' motivation could be enhanced by presenting H4 (*Perceived benefits*, 3.92, ranked third):

'*…we told the residents, 'Just come over and you can get small gifts.' The atmosphere was electric even during the setup – neighbors, elders, even kids, all eager to share their thoughts.'* (planning and design professional, PD 2, interview, April 19, 2022).

4.2.5. Implementation and construction unit

F1 (*Trust*, 4.44), E1 (*Financial incentive*, 4.17), and H1 (*Prejudice against the working group*, 4.17) are the most crucial factors for construction practitioners. During neighborhood rehabilitation, constructors are more engaged with residents than most other stakeholders. As a result, they took personal relations with residents more seriously to prevent potential distrust or miscommunication and to guarantee the smooth implementation of site construction works:

'*…I heard residents murmuring, 'This is just another vanity project,' and 'If we band together, we can easily halt their construction.' When I heard these whispers, it was clear to me that something was not right.*' (DC 1, interview, April 23, 2022).

Moreover, construction respondents noted that their ability to progress in construction depends on the previous experience of neighborhood rehabilitation. They often had to address the issues caused by other stakeholders, especially the previous constructors:

'*…some past projects, to be honest, were just for show. It is common for residents to have strong doubts about us. Our façade replacement work got delayed by two months as the residents were not on board.*' (DC 3, interview, May 15, 2022).

4.2.6. Consulting party

Consultants identified D2 (*Rewards and punishments*), H4 (*Perceived benefits*), and G1 (*Traits and capacity*) as the most influential factors for RP. The mean score for these three factors is 4.36. In addition to the recurrently mentioned D2 and H4 by other stakeholders, the consultant party emphasized the importance of *Traits and capacity* of the working group for effective RP:

'*…the B Neighborhood Committee is really enthusiastic about RP, especially because their director is skilled in managing residents and eager to experiment with innovative RP methods. Frankly, sometimes their ideas are more well-developed and refined than even ours!*' (CP 2, interview, April 16, 2022).

4.2.7. Resident

Residents prioritized F3 (*Equity and justice*) and assigned a mean score of 4.52. Specifically, 63.0 % of participants rated 5. They considered G2 (*Attitude*) the second most critical factor, with a mean score of 4.43, and half of the respondents gave it a score of 5. For these two factors, resident interviewees explained:

'*…yes, I am only a tenant, but I also need a place to park when they redo the roads. If I cannot get my two cars parked next door for a discounted ¥400, everyone should not park there!*' (NR 4, interview, May 27, 2022).

'*…they came over a dozen times to fix my leaky roof, even apologizing for making a mess in my place. They are good listeners, too, always up for feedback. So, for future construction stuff, I am totally backing them up.*' (NR 1, interview, May 22, 2022).

		OVERALL	Local government	Community-based organization	Planning and design professional	Implementation and construction unit	Consulting party	Neighborhood resident
D1	Financial incentives	1	5	1	1	6	12	3
E1	Information disclosure and transparency	2	1	5	7	2	5	10
F1	Trust	3	9	6	4	1	9	14
D2	Rewards and punishments	4	8	18	2	5	1	8
G3	Credibility of the working team	5	12	11	6	9	4	4
E2	Intra-group communication	6	3	4	8	10	16	19
G2	Attitude of the working team	7	11	17	5	14	10	2
G1	Traits and ability of the working team	8	14	8	11	13	3	6
B1	Appearance change	9	2	25	19	7	15	22
E3	Inter-group communication	10	4	3	12	11	17	26
B3	Environmental and ecology impact	11	6	15	13	8	29	16
F3	Equity and justice	12	26	7	17	26	7	1
H7	Community attachment	13	16	9	25	16	6	11
H4	Perceived benefits from participation	14	10	14	3	4	2	35
F2	Empowerment	15	27	16	17	17	11	27
D4	Human inputs	16	30	22	15	21	20	12
D3	Equipment and infrastructure	17	15	2	13	32	18	13
B2	Economic impact	18	21	34	10	20	28	20
B4	Socio-cultural impact	19	19	13	22	23	32	24
D7	Time allowance	20	33	9	24	29	12	15
C1	Goal setting	21	12	33	28	25	24	7
C5	Representation of the participant	22	25	31	31	12	34	17
E4	Evaluation criteria	23	22	19	22	28	30	18
C4	Participation approach	24	24	28	33	27	8	25
H6	Participation-related knowledge and skills	25	28	23	32	24	33	22
H2	Previous experience	26	7	32	25	22	21	31
H8	Characteristics of the resident	27	18	20	21	19	30	32
H5	Consistency with resident's self-identity	28	31	26	34	18	26	30
H3	Perceived practical constraints	29	17	20	9	15	18	36
H1	Prejudice against the working team	30	28	28	25	3	12	37
A1	Policy environment	31	23	27	20	33	23	29
D5	Participation-assistance technologies	32	37	12	35	30	35	9
D6	Participant education	33	34	23	37	35	25	5
C3	Timing to participate	34	19	34	30	36	22	28
C2	Task allocation	35	36	36	36	34	36	21
A2	Administration arrangement	36	32	30	15	31	37	34
A3	Socio-cultural environment	37	35	37	29	37	26	33

Fig. 5. Rankings of Influencing Factors for Effective RP in Neighborhood Rehabilitation.

4.3. Consensus and conflict in stakeholder perceptions of critical factors

4.3.1. Consensus and conflict between stakeholder groups

The results of one-way ANOVA (Table 4, Table 5) show that six stakeholder groups agreed on 12 out of 37 factors (for Levene's test results, check Appendix D). Stakeholders agreed on the significant impact of D1 (*Financial incentive*) and D2 (*Rewards and punishments*) on effective RP. Besides, they had a unified understanding regarding *Information* and *Communication* relevant factors (E1, E2, E3 with the

lowest F values). They also agreed that the influence of H2 (*Previous experience*) and H8 (*Resident characteristics*) on effective RP was limited.

By contrast, D6 (*Participation education*) has the highest F value, indicating it is the most conflicting factor. The government, residents, community-based organizations, and consultants attributed more importance to D6 than the designers and constructors. Additionally, most pairs of stakeholders (8/15) exhibited significant variances in their comprehension of H1 (*Prejudice on the working team*). Resident interviewee NR 2 (interview, May 22, 2022) declared: '*…I judge things based on facts…grudges do not affect my judgment.*' However, the contractors and community workers agreed with the consultants: '*…some residents use participation as an opportunity to vent their frustration on some of us.*' (CP 1, interview, April 15, 2022).

Among the top 5 factors in the general ranking, a conflict appears in F1 (*Trust*) among stakeholder groups. The constructors ascribed a higher significance to F1 compared to the government, and this difference is statistically significant. Interview with NR 3 (May 27, 2022) implies that residents' trust in the government and the constructors lie at opposite extremes: '*…honestly, I am not fully aware of the government's specific actions, but I do believe they are committed to 'serving the people'*…' and '*…our neighborhood has not seen a single theft in the last twenty years. But, ever since the construction crew showed up, three households have had their belongings stolen, all within just a month!'*.

Interestingly, the degree of residents' (dis)trust changed after the rehabilitation. They shifted from distrust to trust for constructors, while losing their trust in designers:

'…construction guys work super hard. Regarding the technical stuff, we are clueless, but I believe they know what they are doing and will not mess things up.' (NR 1, interview, May 22, 2022).

'…any fool knows an awning needs a slant to shed water, but these designers wanted it flat. At least I can find community workers and constructors around the neighborhood, but the designers? Nowhere to be found. When I did track them down, they just said 'it could not be changed'. After that, I stopped bothering with feedback!' (NR 3, interview, May 27, 2022).

After the outbreak of the COVID-19 pandemic, residents became more trusting in Neighborhood Committees, leading to a greater endorsement of the government. This made the rehabilitation process move forward more smoothly. As NR 3 (interview, May 27, 2022) and NR 4 (interview, May 27, 2022) explained:

'*…I bet 80 %, even 90 %, of the residents back what the Neighborhood Committee's doing. Why? Cause what they are doing really hits you in the feels.*'

'*…during the rehabilitation, I often found myself calling them in the middle of the night due to the noise. Despite being just a tenant, they always took my concerns seriously. That is why I know, when I approach the Neighborhood Committee with a problem, they may not always have a quick solution, but I trust that they will do their utmost to find a way to help me.*'

4.3.2. Consensus and conflict due to rehabilitation experience

The results of two-way ANOVA (Table 6) show that the importance of H1 (*Prejudice against the working team*) and H5 (*Consistency with self-identity*) depends on the level of rehabilitation experience ($P < 0.05$). Nevertheless, this interaction effect is insignificant for the remaining 31 factors. In addition, rehabilitation experience is significantly associated with stakeholders' perception of D5 (*Participation-assistance technologies*) and G1 (*Traits and capacity* of the working group).

Table 7 indicates a significant difference in the perception of D5 between stakeholders involved in 'below 5 projects' and those in 'above 5 projects'. The latter group rated D5 an average of 0.618 points higher than the former at $p < 0.05$. The positive interaction effects of rehabilitation experience are also significant for G1. As Fig. 6 depicts, irrespective of their groups, stakeholders regarded these two factors as more critical as their rehabilitation experience accumulated.

5. Discussion

5.1. Objectives for resident participation

The case of Wuhan shows that stakeholders involved residents in neighborhood rehabilitation primarily for substantive rationales, i.e., collecting all relevant information for well-informed and considered decisions, mirroring the findings in developing (Fahmi et al., 2016) and developed cities (Niitamo, 2021; Uittenbroek et al., 2019). Zhou et al. (2019)'s research in urban China shows a shift in RP objectives toward empowerment and citizenship among higher-educated stakeholders. However, these democratic ideals were not appreciated in our research

Table 4
Analysis result of one-way ANOVA and Post-hoc test.

Factors	Between Groups		Within Groups		F	Sig.	Post-hoc test	
	Sum of Squares	df.	Sum of Squares	df.			Group	Bonferroni ($p < 0.05$)
A1	30.198	5	285.434	249	5.269	0.000	4	CO > DC; PD > DC; NR > DC; CP > DC
A2	16.812	5	281.713	249	2.972	0.013	1	LG > DC; CO > DC; PD > DC;
B3	7.815	5	197.417	249	1.971	0.083*		
B4	12.834	5	221.692	249	2.883	0.015		
C1	30.050	5	187.582	249	7.978	0.000	3	NR > CO; NR > PD; NR > DC
C3	46.837	5	272.301	249	8.566	0.000	5	LG > DC; CO > DC; PD > DC; NR > DC; CP > DC
C4	28.800	5	169.765	249	8.448	0.000	5	LG > CP; NR > PD; CP > PD; NR > DC; CP > DC
C5	16.801	5	238.195	249	3.513	0.004	2	NR > LG; NR < PD
D3	48.496	5	212.422	249	11.369	0.000	5	LG > DC; CO > DC; PD > DC; NR > DC; CP > DC
D4	19.177	5	203.749	249	4.687	0.000	2	NR > LG; NR < DC
D6	81.152	5	200.480	249	20.158	0.000	7	NR > LG; CO > PD; CO > DC; NR > PD; CP > PD; NR > DC; CP > DC
D7	41.374	5	216.257	249	9.528	0.000	7	CO > LG; NR > LG; LG > CP; CO > DC; NR > PD; NR > DC; CP > DC
E1	3.721	5	219.205	249	0.845	0.519*		
E2	2.408	5	180.274	249	0.665	0.650*		
E3	5.913	5	175.789	249	1.675	0.141*		
E4	23.969	5	209.662	249	5.693	0.000	1	NR > DC
F1	11.710	5	207.639	249	2.808	0.017	1	DC > LG
F2	12.040	5	187.309	249	3.201	0.008	1	CP > LG;
G1	21.526	5	182.999	249	5.858	0.000	6	NR > LG; CP > LG; NR > PD; CP > PD; NR > DC; CP > DC
G2	19.215	5	165.468	249	5.783	0.000	3	NR > LG; NR > PD; NR > DC
G3	14.016	5	177.843	249	3.925	0.002	2	NR > LG; NR > DC
H2	6.101	5	199.295	249	1.524	0.183*		
H5	9.714	5	202.545	249	2.388	0.039		
H7	20.419	5	165.306	249	6.152	0.000	5	NR > LG; NR > PD; CP > PD; NR > DC; CP > DC
H8	4.272	5	267.492	249	0.795	0.554*		

* = $p > 0.05$.

Table 5
Analysis result of Games-Howell and Post-hoc test.

Factors	Statistica	df1	df2	Sig.	Post-hoc test	
					Group	Pairwise comparison
A3	9.863	5.000	109.299	0.000	5	DC > LG; CO > DC; PD > DC; NR < DC; CP < DC
B1	1.728	5.000	108.492	0.134*		
B2	2.109	5.000	108.400	0.070*		
C2	17.085	5.000	105.901	0.000	5	NR > LG; DC > CO; NR > CO; NR > DC; NR > CP
D1	2.413	5.000	106.322	0.041		
D2	2.262	5.000	109.076	0.053*		
D5	13.715	5.000	106.852	0.000	7	CO > LG; NR > LG; CO > PD; CO > DC; NR > PD; NR > DC; NR > CP
F3	15.534	5.000	106.852	0.000	5	NR > LG; CO > DC; DC < PD; NR > DC; CP > DC
H1	12.707	5.000	109.635	0.000	8	DC < LG; NR > LG; CP > LG; CO > NR; NR > PD; PD > CP; DC > NR; CP < NR
H3	6.122	5.000	109.192	0.000	5	LG > NR; CO > NR; PD > NR; DC > NR; CP < NR
H4	7.417	5.000	111.126	0.000	5	CP > LG; NR > CO; PD > NR; DC > NR; CP < NR
H6	5.017	5.000	106.588	0.000	2	NR > PD; NR > DC

* = p > 0.05.

samples. Specifically, the phenomenon of "lack of a shared vision" appeared between stakeholder groups. Although the central government regarded RP as a process of education and awareness building, these objectives were recognized by neither the local government nor the design and construction industry. In addition, designers and contractors involved residents in a one-off and problem-centric manner, with the aim of searching for personal and institutional interests.

5.2. Critical factors for effective resident participation in the Post-COVID-19 era

5.2.1. Financial incentive – Limited and unevenly distributed

Financial incentive (for participation organizers) is identified as the most critical factor for effective RP in post-COVID-19 China, consistent with pre-COVID-19 studies in first-tier cities in China (Liu et al., 2018b), Indonesia (Fahmi et al., 2016), and Europe (Dekker and Van Kempen, 2008; Niitamo, 2021). The case of Wuhan suggests that there were few financial incentives for organizing RP. Moreover, the limited incentives were unevenly distributed among different Neighborhood Committees.

The prolonged effort for pandemic control placed considerable financial burdens on the governments of Wuhan. In the projects of neighborhood rehabilitations, specifically, there is a noticeable cut in governmental investments from ¥70,000 per household in early 2020 to less than ¥20,000 at the end of 2022. Because of increasingly limited financial budgets, the governments strategically target financial resources to selected Neighborhood Committees based on the Committee's reputation and personal networks between Committee directors and government leaders. The frequent contact with government leaders, either in public or private, makes Committee directors more aware of fund allocation and thus proactive in applying for special funds. With additional financial support, residents are more actively involved in neighborhood affairs, such as neighborhood rehabilitation. In contrast, neighborhoods that initially show poor participation results may find it increasingly challenging to secure the necessary funds and resources to rectify ineffectiveness. This is consistent with Gray and Barford (2018)'s observations on the impact of the 2008 economic crisis on the UK government. The unequal allocation of national funding intensified disparities among local governments, resulting in geographic inequalities in the UK. In the post-pandemic era of China, austerity might emerge as a reality for local governments in second- and third-tier cities. Under this circumstance, the local government is warranted to prioritize more even *Financial incentive* distribution and preempt potential geographically inequitable participation.

5.2.2. Information sharing and communication – Precise and avoid excess

Information and *Communication*-relevant factors are also crucial for effective RP. As indicated by previous studies (Beierle and Cayford (2002); Bobbio, 2019; Orchowska, 2019), the value of information and communication is to mitigate skepticism and unfavorable perceptions, foster mutual learning, engender trust, and ultimately pave the way for enhanced cooperation. Despite this, aligning with Yu and Leung (2015)'s observations, our study shows that the specialized jargon employed in neighborhood rehabilitation elevated the threshold of information sharing and curtailed residents' willingness to communicate. Thus, as Dickens (2013) and Li et al. (2020d) advocate, practitioners are advised to employ straightforward language and leverage information and communication tools (ICTs), such as social platforms, to increase inclusivity and broaden public engagement.

Besides, the COVID-19 pandemic and subsequent lockdowns reconfigured the mode of information exchange. To mitigate virus transmission, the government switched the way of RP from traditional face-to-face communication to digital platforms. The caveat was that previously active older participants gradually disengaged due to their inability to use these platforms. Therefore, it is imperative to devise more inclusive participatory channels that are convenient for the younger generation and ensure the continued engagement of the senior population. Additionally, although social media platforms bolster information transparency, they introduce challenges related to information filtering and processing at the same time (Sun, 2015). On the official government platform, discussions related to neighborhood rehabilitation are often overshadowed by many other non-related issues. Stakeholders may perceive the ensuing flood of unstructured data as overwhelming, tedious, and burdensome, thus deterring active participation (Tang et al., 2022). Our interview results also show that excessive information misled residents, resulting in their unrealistic expectations of rehabilitation and consequently diminished participation satisfaction and perceived usefulness of RP.

5.2.3. Trust and distrust – But not over-trust

Effective RP requires mutual *Trust* among stakeholders (Benedjma and Mahimoud, 2020; Boyle and Michell, 2020). Trust and RP would further reinforce each other and lead to the accumulation of social capital (Dekker, 2007). Similarly, as Nathansohn and Lahat (2022) conclude in the Israeli context, distrust can also be a salient catalyst for bottom-up RP approaches. In Wuhan, such distrust manifested in resident-initiated participation, such as the demand for renovation information, monitoring of construction materials and outcomes, and lucidity in the methodologies and pricing models for parking space allocation. Thus, while fostering *Trust* is required, strategically channeling residents' distrust is equally crucial.

Contractors prioritized trust more than the governmental bodies, possibly due to residents' inherent distrust towards them and over-trust in government. As Brown et al. (2016) highlight, the distrust of contractors results from a mixture of inherent negative impressions and the absence of power for residents to choose contractors. Our results show that neighborhood rehabilitation provided a conducive environment for

Table 6
Analysis results of two-way ANOVA.

Cd.	Main effects						Interaction effect		
	Stakeholder group			Rehabilitation experience			Stakeholder group* Rehabilitation experience		
	F (4,191)	Sig.	Partial η2	F (1,191)	Sig.	Partial η2	F (4,191)	Sig.	Partial η2
A1	1.885	0.115	0.038	0.907	0.342	0.005	0.347	0.846	0.007
A2	2.983	0.020*	0.059	0.355	0.552	0.002	1.073	0.371	0.022
A3	4.512	0.002*	0.086	0.373	0.542	0.002	1.849	0.119	0.037
B3	0.363	0.835	0.008	0.202	0.654	0.001	0.569	0.685	0.012
B4	0.652	0.626	0.012	0.046	0.830	0.000	0.554	0.697	0.011
C1	1.917	0.109	0.039	3.557	0.061	0.018	0.922	0.452	0.019
C2	3.653	0.007*	0.071	0.975	0.325	0.005	2.163	0.075	0.043
C3	4.583	0.002*	0.084	1.564	0.213	0.008	0.706	0.589	0.015
C4	3.470	0.009*	0.068	2.384	0.124	0.012	1.078	0.369	0.022
C5	0.565	0.688	0.012	0.041	0.841	0.000	1.172	0.324	0.024
D1	1.033	0.391	0.021	0.349	0.556	0.002	1.067	0.374	0.022
D2	0.313	0.869	0.007	0.070	0.791	0.000	1.230	0.300	0.025
D3	4.110	0.003*	0.079	2.658	0.105	0.014	1.617	0.171	0.033
D4	2.319	0.059	0.046	0.024	0.877	0.000	1.350	0.253	0.027
D5	4.266	0.002*	0.082	4.608	0.033*	0.024	0.959	0.426	0.020
D6	4.537	0.002*	0.087	1.666	0.198	0.009	2.080	0.085	0.042
D7	3.967	0.004*	0.077	3.902	0.050	0.020	0.306	0.874	0.006
E1	0.230	0.922	0.005	0.072	0.789	0.000	0.406	0.804	0.008
E2	0.663	0.618	0.014	1.822	0.179	0.009	0.257	0.905	0.005
E3	1.331	0.260	0.027	0.114	0.736	0.001	0.369	0.811	0.008
E4	2.651	0.035*	0.053	2.749	0.099	0.014	0.826	0.510	0.017
F2	2.734	0.030*	0.054	2.720	0.101	0.014	0.652	0.626	0.013
F3	2.810	0.027*	0.056	0.193	0.661	0.001	0.500	0.736	0.010
G1	2.200	0.071	0.044	4.019	0.046*	0.021	0.092	0.985	0.002
G2	0.874	0.481	0.018	0.730	0.394	0.004	0.071	0.991	0.001
G3	1.371	0.245	0.028	2.411	0.122	0.012	0.253	0.907	0.005
H1	2.698	0.032*	0.053	0.012	0.912	0.000	2.582	0.039*	0.051
H2	1.230	0.300	0.025	3.488	0.063	0.018	0.840	0.501	0.017
H3	1.236	0.297	0.025	0.009	0.925	0.000	0.853	0.493	0.018
H4	1.136	0.341	0.023	0.597	0.441	0.003	1.384	0.241	0.028
H5	2.975	0.021*	0.059	0.295	0.587	0.002	2.572	0.039*	0.051
H6	2.036	0.091	0.041	1.223	0.270	0.006	1.210	0.308	0.025
H7	4.183	0.003*	0.081	2.884	0.091	0.015	1.390	0.239	0.028

* = $p < 0.05$.

Table 7
Pairwise Comparisons in D5 and G1 factors stratified by rehabilitation experience.

	Rehabilitation experience		Mean Difference (I-J)	Std. Error	Sig.	95 % Confidence	
						Lower Bound	Upper Bound
D5 (*Participation-assistance technologies*)	Below 5 projects	Above 5 projects	-0.618*	0.288	0.033*	−1.186	−0.050
	Above 5 projects	Below 5 projects	0.618*	0.288	0.033*	0.050	1.186
G1 (*Traits and capacity* of the working group)	Below 5 projects	Above 5 projects	-0.449*	0.224	0.046	−0.891	−0.007
	Above 5 projects	Below 5 projects	0.449*	0.224	0.046	0.007	0.891

* = $p < 0.05$.

residents to increase their trust in contractors. Possible strategies to promote mutual trust include frequent communication, timely information disclosure, efficient problem-solving, empathetic engagement, and unwavering commitment.

In the post-COVID-19 era, however, over-reliance on a single stakeholder group can be a barrier to effective RP in the long term. Liu et al. (2021)'s study of six Chinese cities and Han et al. (2023)'s cross-country observations suggest that the lockdown promotes the political trust among the public. While our case of Wuhan shows that it also led to residents' undue dependency on a particular stakeholder – the Neighborhood Committee. Many residents started to view rehabilitation as the responsibility of the Committee, thereby adopting a passive stance towards rehabilitation activities—a sentiment also emphasized by Nathansohn and Lahat (2022). Additionally, our results suggest that excessive trust inadvertently justified residents' apathy and made their non-involvement seem reasonable. As NR3 remarked in our interview on May 27, 2022: '*…I trust them, so I leave all decisions to them…*' In this sense, maintaining a delicate balance between trust and distrust is crucial for effective RP, with a need to actively address and counteract unwarranted trust between stakeholder groups.

5.2.4. *Capacity of the working group – Especially soft skills*

Trait and capacity (of the working group) are prerequisites for inducing and maintaining trust and contributing to more effective RP. Additionally, our case of Wuhan shows that, in future RP initiatives, extra emphasis could be placed on developing *Trait and Capacity* of the working group. Stakeholders became increasingly aware of the importance of it as they gained experience in rehabilitation projects (Fig. 6). Particularly, the ability to leverage external resources is vital after the COVID-19 pandemic. In the post-COVID-19 era, the Wuhan government is increasingly turning to the austerity measure, which are common for governments in Western cities since the 2008 financial crisis. The prolonged epidemic prevention efforts place significant economic burdens on local government, as evidenced by decreases in central government

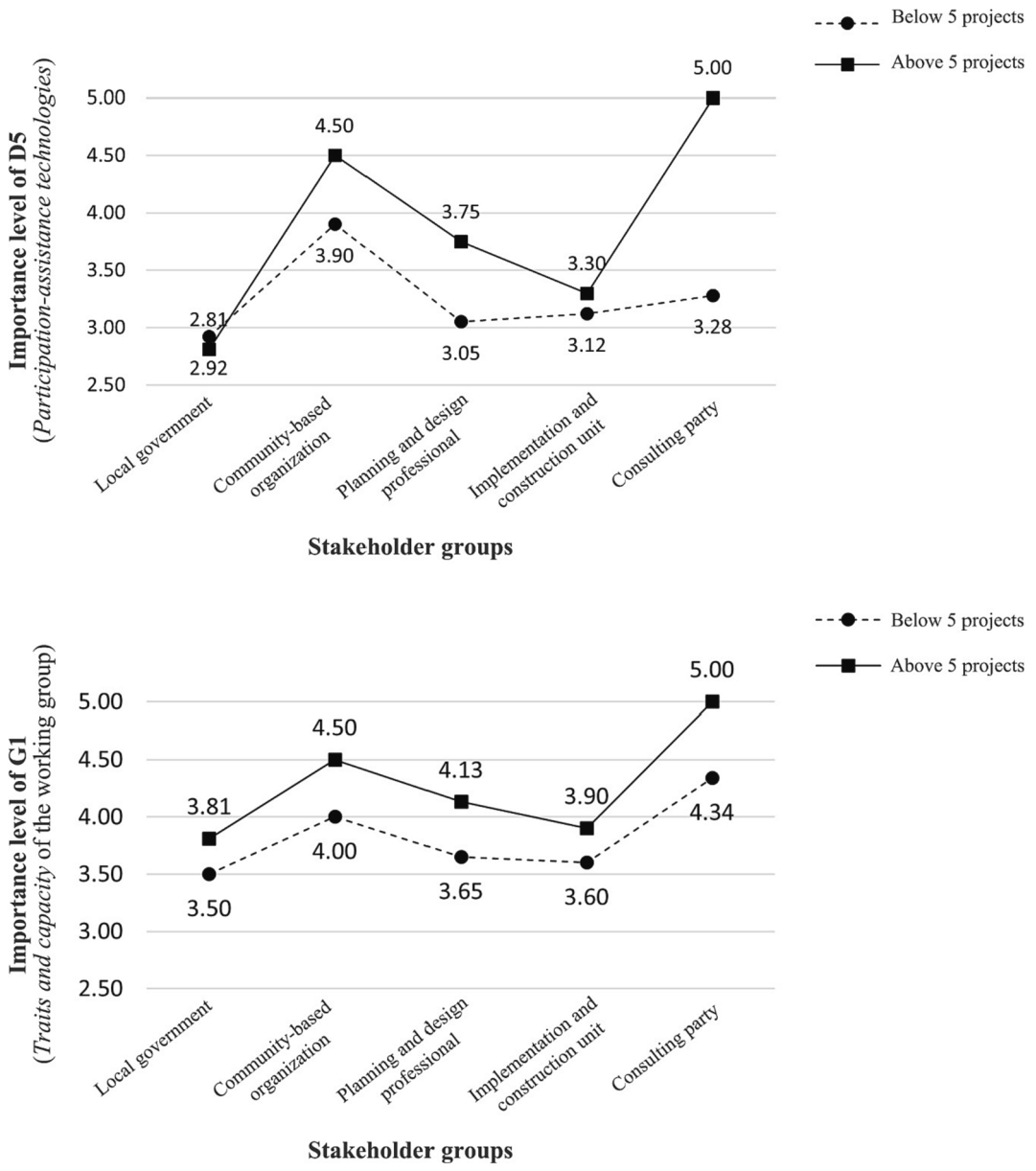

Fig. 6. The Interaction Effects of Rehabilitation Experience and Stakeholder Group on the Rating of Factors D5 and G1.

funding, declines in local tax revenues, and staffing shortages. This further results in the diminishing capacity of the government to maintain pre-pandemic levels of public service delivery. Closely related, leadership, networking, and communication skills are also crucial for RP. These capacities enable community workers to navigate projects better and thus contribute to securing government funding and resources. Echoing Purdue (2001)'s research in the U.K., the Wuhan case indicates that the rehabilitation projects overseen by adept community workers produced more promising and enduring outputs, such as residents' high levels of participation satisfaction and their repeated participation in neighborhood issues.

5.3. Research Implications

Regarding limited financial and administrative resources, community-based organizations are suggested to actively reflect their challenges to governmental entities and consulting parties. For example, they can use social platforms to disseminate images of the declining neighborhood environment to the broader community, aiming to arouse government attention (Nathansohn and Lahat, 2022). In addition to fostering soft skills among the organization members (Brown et al., 2016), they could pay more attention to the intricate relations among residents and facilitate the recognition of neighborhood leaders. By harnessing these neighborhood leaders' expertise, trust, and social capital, community workers are more likely to overcome internal obstacles without external resources (Liu et al., 2023).

Designers are advised to use non-material rewards to promote RP. As Gneezy et al. (2011) note, intrinsic and social motivations yield enduring effects and genuine behavioral changes over financial incentives. Meanwhile, a streamlined participation process is suggested. For example, the overarching design blueprint can be decomposed into more manageable tasks, thus reducing barriers to entry. Furthermore, improving the participatory experience by making it a leisure activity to mitigate residents' negative perceptions of RP is viable.

In response to residents' distrust, constructors are advised to present official documentation of qualifications and credentials before construction. Besides the routine disclosure of work progress, the constructors could invite residents to monitor the construction activities. To

achieve sustained mutual trust, it is also necessary to guarantee information transparency and communication throughout the construction process (Bobbio, 2019; Orchowska, 2019).

The consulting party needs to alleviate the knowledge, spatial, and temporal constraints of RP, and to reduce RP's dependence on financial and human resources. Proposed measures include enhancing ICTs (Li et al., 2020c), and simplifying and visualizing information on social platforms. Alternatively, as exemplified by Nathansohn and Lahat (2022) in Israel, a machine learning-based platform can be established for parsing resident comments, therefore enabling their subconscious participation in sharing neighborhood issues.

When selecting Committee members, residents could emphasize candidates' interpersonal competencies, including leadership, problem-solving, and networking. Moreover, as shown in our results, an undue level of *Trust* resulted in an unwarranted transfer of power to the Neighborhood Committee. Suppose the Committee collaborates too closely with the local government. In that case, there is a risk of disregarding the factors of *Equality and Justice*, which were rated most critical for effective RP by residents. To circumvent such issues, residents may require Committees to disclose the details of collaborations and engagements with external stakeholders.

Finally, to address the issue of incentive shortage, the government is suggested to promote horizontal information and resource exchange among Neighborhood Committees. This can be achieved by establishing communication platforms that enable community workers to build relational capital, expand their social networks, and secure support from the wider community. Moreover, RP could be mandated as a precondition for accessing government funding, as suggested by Uittenbroek et al. (2019). Additionally, local governments should establish clear funding criteria. It is crucial to prevent biases such as 'favoritism' or 'personal relationships' from skewing the allocation of incentives and resources.

6. Conclusions

Effective RP hinges on the active involvement of residents, as well as efficient management of the organizers. Using 30 interviews and 267 questionnaires collected in Wuhan, China, this study explores how the perception of critical factors for effective RP varies among six major stakeholder groups: local government, community-based organization, designer, contractor, consulting party, and resident. Thirty-seven factors were identified. While all these factors were perceived as important by stakeholders, the most critical five factors are *Financial incentive* (for participation organizers), *Information disclosure and transparency*, *Trust*, *Rewards and punishments* (for residents), and *Credibility* (of the working team). Moreover, different stakeholder groups have their specific idea on the most critical factors for effective RP:

- Local government—*Information disclosure and transparency*.
- Community-based organization—*Financial incentive* (for participation organizers).
- Planning and design professional—*Financial incentive* (for participation organizers).
- Implementation and construction unit—*Trust*.
- Consulting party—*Reward and punishment* (for residents).
- Residents—*Equity and justice*.

The ANOVA results highlight stakeholder consensus on 12 of the 37 factors, especially on the importance of *Financial incentive*, *Information* and *Communication*. In contrast, factors such as *Previous experience*, *Consistency with self-identity*, and *Resident characteristics* were perceived as least important. Notably, with the accumulation of rehabilitation experience, stakeholders attributed greater significance to the factors of *Participation-assistance technology* and *Trait and capacity* (of the working group).

There are some limitations of this study and promising directions for future research. First, this study focuses on identifying critical factors perceived by different stakeholder groups for effective RP. The mechanism underlying how these factors affect the effectiveness of RP at different levels requires further examination. Second, this study represents a step forward in identifying causal relationships between factors. For instance, *Credibility* and *Communication* can impact *Trust*. Future studies will benefit from exploring causal inferences regarding the interrelationship between these factors as well as their influence on RP experiences (e.g., the frequency, length and satisfaction of RP). Third, the research suggests that stakeholders' perceptions of critical factors evolved over time. As observed in Wuhan, the COVID-19 pandemic overturned stakeholder views on the factors of effective RP, such as *Financial incentive*, *Trust*, and *Information transparency*. The longitudinal analysis and cross-region comparisons are promising to shed light on changes in stakeholders' perception of effective RP over space and time.

Intellectual Property.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

Research Ethics.

We further confirm that any aspect of the work covered in this manuscript that has involved human participants has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

The research ethics are approved by Human Research Ethics Committee (HERC) TU Delft. The approve letter is shown as below:

CRediT authorship contribution statement

Yu Li: Writing – Original Draft, Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Visualization. **Yinhua Tao:** Writing – Review and Editing, Validation, Data Curation. **Queena K. Qian:** Writing – review & editing. **Erwin Mlecnik:** Methodology, Writing – Review and Editing. **Henk J. Visscher:** Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Interviewee profile.

Group	Cd.	Position	Profile	Interview time (DD/MM/YY)
Local government	LG1	Section director	Government Department at Wuhan Municipality	01/05/22
	LG2	Officer	Government Department at Wuhan Municipality	03/06/22
	LG3	Section director	Government Department at District level	27/04/22
	LG4	Staff	Government Department at District level	10/05/22
	LG5	Officer	Sub-district Administrative Office	20/04/22
	LG6	Section director	Sub-district Administrative Office	20/04/22
Community-based organization	CO1	Director	Neighborhood Committee A	21/04/22
	CO2	Director	Neighborhood Committee B	22/04/22
	CO3	Director	Neighborhood Committee C	22/04/22
	CO4	Director	Homeowner Committee A	03/05/22
Planning and design professional	PD1	Chief planner	Design and Planning Institute A	18/04/22
	PD2	Architect	Design Company A	19/04/22
	PD3	Chief architect	Design Company B	19/04/22
	PD4	Designer	Design and Planning Institute B	04/05/22
Implementation and construction unit	DC1	Section director	Local District Development Group A	23/04/22
	DC2	Manager	Local District Development Group B	24/04/22
	DC3	Manager	Construction Company A	15/05/22
	DC4	Manager	Construction Company B	20/05/22
Consulting party	CP1	Professor	Local University A	15/04/22
	CP2	Professor	Local University B	16/04/22
	CP3	Director	NGO for Neighborhood Building	29/04/22
	CP4	Staff	Social Service Organization	05/05/22
	CP5	Journalist	Local Newspaper	15/05/22
Neighborhood resident	NR1	Homeowner	Rehabilitated Neighborhood A	22/05/22
	NR2	Tenant	Rehabilitated Neighborhood A	22/05/22
	NR3	Homeowner	Rehabilitated Neighborhood B	27/05/22
	NR4	Tenant	Rehabilitated Neighborhood B	27/05/22
	NR5	Shopkeeper	Rehabilitated Neighborhood B	28/05/22
	NR6	General public	Neighborhood C	17/04/22
	NR7	General public	Neighborhood D	18/04/22

Appendix B. Codebook of interview data

Table B1 Data categorization

Data collection question	Role	Objective	Importance of factor			
			Whether	Why	How	To what extent
What is your role in neighborhood rehabilitation?						
What is your role in RP?						
What do you expect from organizing RP?						
Does this factor influence effective resident participation? How? To what extent? Why?						

Table B2 Data coding

Question	Theme	Code
What is your role in rehabilitation?	Stakeholder group	Local government
		Community-based organization
		Planning and design professional
		Implementation and construction unit
		Consulting party
		Neighborhood resident
What is your role in RP?	Role	Role in rehabilitation
		Role in RP
What do you expect from organizing RP?	RP objective	See Table 1
Does this factor influence effective resident participation? How? To what extent? Why?	How	Motivate
		Hinder
	To what extent	Extremely unimportant
		Unimportant
		Neither unimportant nor important
		Important
		Extremely important
	Why	

Appendix C. Survey results

General Ranking				
Cd.	Influencing factors	Mean	SD	Rank
D1	Financial incentives	4.13	0.97	1
E1	Information disclosure and transparency	4.11	0.94	2
F1	Trust	4.1	0.93	3
D2	Rewards and punishments	4.06	0.99	4
G3	Credibility	4.02	0.87	5
E2	Intra-group communication	3.96	0.85	6
G2	Attitude	3.96	0.85	7
G1	Traits and capacity	3.96	0.9	8
B1	Appearance change	3.91	0.94	9
E3	Inter-group communication	3.89	0.85	10
B3	Environmental and ecology impact	3.88	0.9	11
F3	Equity and justice	3.84	1.01	12
H7	Community attachment	3.84	0.86	13
H4	Perceived benefits	3.8	1.18	14
F2	Empowerment	3.77	0.89	15
D4	Human inputs	3.76	0.94	16
D3	Equipment and infrastructure	3.74	1.01	17
B2	Economic impact	3.72	1.08	18
B4	Sociocultural impact	3.69	0.96	19
D7	Time allowance	3.68	1.01	20
C1	Goal setting	3.68	0.93	21
C5	Representation of the participant	3.66	1	22
E4	Evaluation criteria	3.65	0.96	23
C4	Participation approach	3.61	0.88	24
H6	Participation-related knowledge and skills	3.6	0.96	25
H2	Previous experience	3.6	0.9	26
H8	Resident characteristics	3.59	1.03	27
H5	Consistency with self-identity	3.58	0.91	28
H3	Perceived constraints	3.56	1.07	29
H1	Prejudice against the working team	3.53	1.17	30
A1	Policy environment	3.52	1.11	31
D5	Participation-assistance technologies	3.48	1.15	32
D6	Participant education	3.48	1.05	33
C3	Timing to participate	3.45	1.12	34
C2	Task allocation	3.33	0.92	35
A2	Administration arrangement	3.31	1.08	36
A3	Sociocultural environment	3.13	1.17	37

Ranking of influencing factors stakeholders with different roles in neighborhood rehabilitation												
Factors	Local government		Community-based organization		Planning and design professional		Implementation and construction unit		Neighborhood resident		Consulting party	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
E1	4.09	1	4.11	5	3.88	7	4.17	2	4.22	10	4.18	5
B1	4.06	2	3.77	25	3.58	19	4.00	7	4.02	22	4.06	15
E2	3.94	3	4.11	4	3.88	8	3.85	10	4.06	19	4.00	16
E3	3.88	4	4.14	3	3.69	12	3.75	11	3.96	26	4.00	17
D1	3.88	5	4.31	1	4.02	1	4.04	6	4.41	3	4.06	12
B3	3.79	6	3.94	15	3.67	13	3.96	8	4.13	16	3.67	29
H2	3.79	7	3.57	32	3.50	25	3.50	22	3.48	31	3.91	21
D2	3.76	8	3.91	18	3.96	2	4.06	5	4.24	8	4.36	1
F1	3.76	9	4.11	6	3.92	4	4.44	1	4.15	14	4.09	9
H4	3.73	10	3.94	14	3.92	3	4.13	4	2.98	35	4.36	1
G2	3.73	11	3.91	17	3.90	5	3.65	14	4.43	2	4.09	10
C1	3.70	12	3.51	33	3.46	28	3.29	25	4.26	7	3.82	24
G3	3.70	12	4.03	11	3.90	6	3.85	9	4.37	4	4.24	4
G1	3.70	14	4.06	7	3.73	11	3.65	13	4.30	6	4.36	3
D3	3.67	15	4.17	2	3.67	13	2.98	32	4.17	13	3.97	18
H7	3.64	16	4.03	9	3.50	25	3.62	16	4.19	11	4.15	6
H3	3.58	17	3.86	20	3.83	9	3.63	15	2.81	36	3.97	18
H8	3.58	18	3.86	20	3.54	21	3.58	19	3.43	32	3.67	30
B4	3.55	19	3.97	13	3.52	22	3.46	23	4.00	24	3.64	32
C3	3.55	19	3.49	34	3.40	30	2.69	36	3.87	28	3.91	22
B2	3.55	21	3.49	34	3.79	10	3.56	20	4.04	20	3.76	28
E4	3.52	22	3.89	19	3.52	22	3.23	28	4.11	18	3.67	30
A1	3.48	23	3.74	27	3.56	20	2.88	33	3.76	29	3.88	23
C4	3.45	24	3.69	28	3.31	33	3.23	27	3.98	25	4.12	8
C5	3.45	25	3.63	31	3.38	31	3.69	12	4.11	17	3.55	34

(continued on next page)

(*continued*)

Ranking of influencing factors stakeholders with different roles in neighborhood rehabilitation												
Factors	Local government		Community-based organization		Planning and design professional		Implementation and construction unit		Neighborhood resident		Consulting party	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
F3	3.42	26	4.06	7	3.63	17	3.27	26	4.52	1	4.15	7
F2	3.42	27	3.94	16	3.63	17	3.62	17	3.96	27	4.06	11
H1	3.39	28	3.69	28	3.50	25	4.17	3	2.61	37	4.06	12
H6	3.39	28	3.83	23	3.31	32	3.40	24	4.02	22	3.61	33
D4	3.33	30	3.86	22	3.65	15	3.54	21	4.17	12	3.91	20
H5	3.33	31	3.77	26	3.29	34	3.58	18	3.74	30	3.76	26
A2	3.30	32	3.66	30	3.65	15	3.00	31	3.11	34	3.27	37
D7	3.27	33	4.03	9	3.50	24	3.15	29	4.13	15	4.06	12
D6	3.24	34	3.83	23	3.00	37	2.79	35	4.30	5	3.79	25
A3	3.21	35	3.29	37	3.42	29	2.21	37	3.24	33	3.76	26
C2	3.21	36	3.43	36	3.13	36	2.81	34	4.04	21	3.33	36
D5	2.85	37	3.97	12	3.17	35	3.15	30	4.24	9	3.33	35

Appendix D. Test of homogeneity of variances for group comparison

Co	Levene Statistic	df1	df2	Sig.	Comparison method
A1	1.766	5	249	0.120	ANOVA
A2	1.223	5	249	0.299	ANOVA
A3	2.832	5	249	0.017	Games Howell
B1	3.064	5	249	0.011	Games Howell
B2	5.103	5	249	0.000	Games Howell
B3	0.688	5	249	0.633	ANOVA
B4	0.836	5	249	0.525	ANOVA
C1	1.037	5	249	0.396	ANOVA
C2	2.649	5	249	0.024	Games Howell
C3	1.446	5	249	0.208	ANOVA
C4	1.265	5	249	0.280	ANOVA
C5	0.230	5	249	0.949	ANOVA
D1	2.839	5	249	0.016	Games Howell
D2	2.448	5	249	0.034	Games Howell
D3	2.154	5	249	0.060	ANOVA
D4	0.407	5	249	0.844	ANOVA
D5	2.349	5	249	0.042	Games Howell
D6	1.012	5	249	0.411	ANOVA
D7	1.632	5	249	0.152	ANOVA
E1	1.170	5	249	0.324	ANOVA
E2	1.262	5	249	0.281	ANOVA
E3	1.106	5	249	0.358	ANOVA
E4	1.217	5	249	0.302	ANOVA
F1	0.513	5	249	0.766	ANOVA
F2	0.848	5	249	0.517	ANOVA
F3	3.902	5	249	0.002	Games Howell
G1	0.129	5	249	0.986	ANOVA
G2	0.775	5	249	0.568	ANOVA
G3	1.186	5	249	0.316	ANOVA
H1	2.933	5	249	0.014	Games Howell
H2	1.029	5	249	0.401	ANOVA
H3	3.795	5	249	0.002	Games Howell
H4	6.112	5	249	0.000	Games Howell
H5	0.721	5	249	0.608	ANOVA
H6	3.243	5	249	0.007	Games Howell
H7	1.328	5	249	0.253	ANOVA
H8	1.977	5	249	0.083	ANOVA

Appendix E. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.landurbplan.2023.105000.

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