

## HOW TO MAKE URBAN RENEWAL SUSTAINABLE? PATHWAY ANALYSIS BASED ON FUZZY-SET QUALITATIVE COMPARATIVE ANALYSIS (fsQCA)

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**Abstract.** Even though urban renewal has attracted much attention in recent years, relatively few studies focus on the sustainability of urban renewal projects, which is surprising given the associated economic benefits. To fill this gap, we review 31 typical cases of urban renewal in China that have existed for over 10 years and utilize fuzzy set qualitative comparative analysis (fsQCA) to identify causal configurations that lead to a high level of stakeholder satisfaction. Our findings show that: (1) there are four antecedent configurations that lead to the sustainability of urban renewal (these are: ~ preservation of history and culture \* differentiation \* project reformation \* ~ incremental innovation; ~ preservation of history and culture \* differentiation \* commercial publicity \* incremental innovation; preservation of history and culture \* commercial publicity \* ~ project reformation \* incremental innovation; and preservation of history and culture \* differentiation \* ~ commercial publicity \* project reformation \* incremental innovation); (2) compared with other conditions, differentiation and incremental innovation play more important roles in the sustainability of urban renewal; and (3) not only the improvement of the environment but also the operation and management of projects should be considered carefully. This paper contributes to urban renewal literature and offers practical suggestions for sustainable urban development.

**Keywords:** urban renewal, sustainable development, stakeholder satisfaction, fsQCA.

### Introduction

Recently, urban renewal has become an important and popular avenue for urban transformation (Barão et al., 2021; Ferreira et al., 2022). It is conducive to the improvement of the regional environment and residents' quality of life, eventually resulting in benefits to various stakeholders (Costa et al., 2021; Pinto et al., 2021). In China, the government has upgraded cities through urban renewal, with sizeable material and financial resources being invested in these projects. However, we find that a number of urban renewal projects develop at a relatively slow speed and related industries such as tourism and the creative industry do not develop sustainably, which is difficult to achieve the expected results. Longtan Water Town is a good example (*i.e.*, an area of Chengdu that was renewed over 4 years at a cost of 2 billion RMB (about 309 million USD)). Following its opening in 2013, it attracted numerous visitors. Nowadays, plenty of shops have closed and the number of visitors has decreased sharply. This prompts the following

research question: How to make urban renewal sustainable?

Scholars regard sustainability as the ability of a society, ecosystem or developing system to continue future development without dying as a result of resource depletion and damage to the environment (Wang et al., 2017; Lindsay et al., 2020). Based on the triple bottom line proposed by Elkington (1998), sustainable development is a dynamic and coordinated process that aims to achieve a balance between society, economy, and natural systems. This dynamic process can support the continued development of human society and promote social stability. The concept of sustainable development, then, stands as a theoretical foundation for the realization of urban renewal.

Originally, urban renewal mainly involved the fields of urban planning and architecture, coming to gradually extend into other disciplines such as economics, management, sociology, ecology, and history. More recently, scholars have researched sustainable urban renewal from multidisciplinary perspectives, mainly including urban

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planning for sustainable urban renewal, social subsystems within urban renewal, and the assessment of sustainable urban renewal (Poveda, 2017; Lai & Lorne, 2019; Tarakci & Turk, 2021; Wang et al., 2021; Pinto et al., 2023). For instance, Kilić et al. (2019) put forward a methodology used to assess the index of fragmentation for sustainable urban renewal planning, which helps to measure the spatial-functional capacities of the existing land. Lai and Lorne (2019) summarize some examples to explore how to achieve heritage conservation and urban renewal through the application of the Fourth Coase theorem. Xu et al. (2019) develop a decision support system for building demolition. They investigate various indicators (*i.e.*, social, economic, environmental, as well as institutional) for sustainable urban renewal and conduct empirical research to uncover the decision-making process behind demolitions. Existing research on sustainable urban renewal (Poveda, 2017; Shi et al., 2020; Bithas et al., 2021; Musgrove, 2021; Tarakci & Turk, 2021; Wang et al., 2021) is paying increasing attention to people and sustainable development. However, there are few studies on the economic benefits of urban renewal, and on its sustainability based on the balance between society, economy, and environment.

To fill this gap, we choose 31 typical Chinese urban renewal projects that have existed for over 10 years as sample cases to explore how to balance society, economy and environment in urban renewal – namely, how to make urban renewal sustainable – an aim for which the different interests of diverse stakeholders need to be considered. Fuzzy set qualitative comparative analysis (fsQCA) is used and we find that: (1) there are four antecedent configurations that lead to a high level of stakeholder satisfaction. The four configurations can be divided into two types (*i.e.*, one including the presence of the preservation of history and culture and the other excluding it); (2) compared with other antecedent conditions, differentiation and incremental innovation play more important roles in the formation of this outcome, which confirms the findings of previous studies in terms of the pivotal roles of these two antecedents on stakeholder satisfaction; and (3) the operation and management of projects should receive additional attention if the economic benefits of urban renewal are to be increased.

The following theoretical contributions are made by this study. First, by uncovering four equivalent pathways to achieve a high level of stakeholder satisfaction in urban renewal, this study enriches existing research on urban renewal in terms of its research method (Ho et al., 2012; Bochenek & Klemm, 2021; Tarakci & Turk, 2021). The fsQCA approach paves the way for subsequent studies on urban renewal. Second, this study not only highlights the antecedent factors involving architecture and urban planning, but also pays great attention to project management and long-term operation which contributes to the sustainability of economic improvements, addressing the calls of previous studies to engage in a comprehensive examination of society, economy, and environment in urban renewal (Ye, 2019; Wang et al., 2021; Zhang et al., 2021a).

The paper is structured as follow. The next section reviews relevant theories and puts forward a conceptual framework. FsQCA method is described in Section 2, and Section 3 reports two core conditions and four antecedent configurations. Section 4 presents theoretical and practical implications. Lastly, conclusions and future research directions are presented.

## 1. Literature review

### 1.1. Urban renewal

In the 1950s, western countries such as United Kingdom and the United States priorly brought about the concept of “urban renewal”. In the early stage of urban renewal, these countries mainly carried out urban renewal from the perspective of the transformation of architectural planning, such as the “Glorious City” renewal theory (Szilágyi et al., 2021). Countries mainly made efforts to remove slums and old buildings in city centers, establishing new buildings in their place – the “urban beautification movement” of Chicago is a good example. However, in attempting to solve a variety of problems, urban renewal only through establishing new buildings resulted in new problems as well (Birch, 2016). Therefore, scholars advocated that urban renewal should pay more attention to people’s needs (Bai et al., 2020; Barão et al., 2021; Vieira et al., 2022). Under the influence of humanistic and sustainable development theory, urban renewal gradually improves urban functions. In this type of urban renewal, people start to think about dealing with problems from the perspective of sustainable development. This model generates enthusiasm and allows people to participate in small-scale “social planning”.

China’s urban renewal efforts started after those of western countries. As a result of rapid development, the Chinese society and economy have undergone significant transformation, including a marked increase in urbanization – this has extended the scope of urban renewal in the country. Especially after 2000, there has been an increase in people’s cultural expectations, which has prompted scholars in the country to focus more on urban renewal. Some scholars believe that the geographical culture and integrity of cities should be protected (Liu et al., 2018; Wu et al., 2019; Andrade et al., 2022).

Sustainable urban renewal has recently attracted a great deal of research interest. It is regarded as an important approach to increase land value, improve the environment, and promote urban growth, which together can address certain urban development problems and lead to sustainable development (Hutton, 2010; Barão et al., 2021; Louzada et al., 2021; Andrade et al., 2022). The key subjects in this field include urban planning for sustainable urban renewal, social subsystems within urban renewal, and the assessment of sustainable urban renewal (Tan et al., 2016; Chahardowli et al., 2020; Karimi et al., 2020; Zheng et al., 2021). Urban planning usually plays roles in decision making processes on investment in urban renewal, con-

tributing to functional and aesthetic changes (Tan et al., 2016; Pinto et al., 2021; Zheng et al., 2021). As for social subsystems, urban renewal may change communities and also improve community members' lives (Ferreira et al., 2018; Karimi et al., 2020; Zheng et al., 2021). Researchers have assessed sustainable urban renewal through various methods, such as fuzzy Delphi, comprehensive systems based on fuzzy theory, preferred reporting items for systematic reviews and meta-analyses (PRISMA), and so on (Chiu et al., 2019; Jiang et al., 2018; Barão et al., 2021).

In reviewing existing research on urban renewal, we find that it mainly focuses on architecture and urban planning and ignores economic factors. Moreover, as a result of the complexity of assessing stakeholder satisfaction in the context of urban renewal context, our contribution (*i.e.*, the combinations of different antecedent conditions) is novel and un-precedented. It is necessary to explore how the various combinations of conditions lead to the sustainable development of urban renewal. Based on prior literature and on our observations, the antecedent conditions of this research contain the preservation of history and culture, differentiation, commercial publicity, project reformation and incremental innovation (Ye, 2019; Arbab et al., 2020; Guo et al., 2020; Che et al., 2021).

## 1.2. Sustainable development

Originally, sustainable development evolved from several concepts with similar connotation, such as all-round development, organic development, and synchronous development (Rammel & Staudinger, 2002). There are multiple definitions for sustainable development (Chan et al., 2004; Kenzheguzin & Yessekina, 2004; Musango et al., 2012; Searcy, 2017; Shi et al., 2020; Bithas et al., 2021). In economics, sustainable development aims to maximize economic benefits while ensuring the quality of natural resources (Searcy, 2017). From a technological point of view, artificial sustainable development means improving the effectiveness of technology while minimizing resource consumption and emissions (Musango et al., 2012; Shi et al., 2020). Moreover, due to varying levels of development, there are obvious differences in the definition of sustainable development between developed and developing countries. Developed countries emphasize the use of advanced technology to improve product quality and reduce environmental pollution and resource waste in the production process (Poveda, 2017; Lindsay et al., 2020). These countries have greater concerns over the improvement of their populations' quality of life. Developing countries strive to coordinate issues related to population, education, and the economy so as to achieve the requirements of sustainable development (Kenzheguzin & Yessekina, 2004). In general, the basic concept of sustainable development includes adhering to social fairness and justice, paying greater attention to the environment, considering the future, improving quality of life, and charging social responsibilities (Wang et al., 2017; Ye et al., 2021).

Sustainable development is a complex endeavor. Simon (1969) states that complexity refers to the interdependence between subsystems. The higher the extent of interdependence between subsystems, the more complex the system is. The subsystems of sustainable development include the economic subsystem, the social subsystem, and the environmental subsystem. Barbier (1987) believes that the overall goal of a sustainable development system is to maximize the benefits of these three subsystems. Elkington (1998) puts forward the triple bottom line. He considers that economic development should consider economic, environmental, and social factors at the same time, and that some changes will accordingly be made to the market, to a sense of worth, to transparency, to the life cycle of technology, to cooperative relationships, to time, and to corporate governance. As for the market, due to changes to business models, markets will combine innovative strategies with positive influence, becoming one of the driving forces for enterprises to move towards sustainable development (Longoni & Cagliano, 2018). Concerning sense of worth, these unchanging inherent values with absolute advantages will be replaced by values that are responsible to stakeholders, pay attention to quality rather than quantity, and consider multiculturalism (Hammer & Pivo, 2017). As for the life cycle of technology, some potential side effects of new technology and the acceptance of the production process should be considered (Birkel & Müller, 2021). From the perspective of cooperative relationships, close relationships should be developed by mutual cooperation, and complementary cooperation modes will become more important (Wang et al., 2021). As for the aspect of time, on the one hand, since information updates quickly, enterprises should develop at a high speed; on the other hand, due to the need for long-term development, enterprises should possess predictability and take it as a measure of sustainable development (Rammel & Staudinger, 2002). From the perspective of corporate governance, its content should be diversified, not only considering the design of processes and products, but also involving the entire business ecosystem. Throughout, the diversity of decision-making levels is very important (Chen et al., 2019).

## 1.3. Stakeholder satisfaction

Stakeholder theory originated in the XIX century, and gradually developed into a process of corporate governance (Searcy, 2017). Aspects such as corporate social responsibility, ethics and environmental protection have gradually gained importance in corporate governance and are of relevance to corporate stakeholders. Therefore, many managers and scholars started to pay attention to these issues (Grushina, 2017; Bacq & Aguilera, 2021). Stakeholders can be regarded as individuals or groups having impact on the realization of an organizations' goals or being influenced by organizations' goals (Freeman et al., 2018). Meanwhile, Freeman et al. (2018) also emphasize that organizations should not only pay attention to the stakeholders directly related to them, but also

pay attention to other stakeholders including the public, communities and the natural environment. Generally speaking, stakeholder theory emphasizes the integrity of stakeholders. The influence of core stakeholders such as shareholders and employees as well as the influence of other stakeholders such as the public, communities and the natural environment cannot be ignored.

Because the implementation of urban renewal involves many stakeholders including the government, developers, residents, and others, conflicts can occur between their varying interests. As for plenty of urban renewal projects, they ignore the sustainable development of economy and cannot meet economic stakeholders' needs such as improving the economic income of local residents and businesses, eventually moving to decline (Wu et al., 2019; Zheng et al., 2021). Therefore, stakeholder satisfaction including environmental, economic and social aspects has become an important manifestation of the sustainability of urban renewal projects (Wang et al., 2017). In this study, a high level of stakeholder satisfaction is considered as the outcome.

#### 1.4. Preservation of history and culture

Historic buildings in urban areas represent a valuable heritage which needs to be preserved throughout any improvement works (Che et al., 2021). The acceleration of urban update in recent years has caused serious damage to many historic environments, and large-scale demolition and destruction of historic environments have occurred in many cities. Regarding the preservation of history and culture, the main problems are as follows: (1) some historic areas are crowded; (2) historic buildings stay in a state of disrepair for a long time; (3) the protection of environment around historic buildings lacks attention (Lai & Lorne, 2019). During the process of urban renewal, a large number of responsible participants realize that the urban historic environment has become fragile and can easily suffer from competing interests (Wang et al., 2021). Recently, more and more volunteers and organizations actively participate in the protection of historic buildings so as to present and inherit historical and cultural values. Therefore, we consider that the preservation of history and culture is conducive to achieving the sustainable development of urban renewal.

#### 1.5. Differentiation

In this study, differentiation refers to the difference between one urban renewal project and other projects. Distinctive projects can be more competitive. These projects usually impress people through showing their own unique values. However, it has been obvious that urban renewal projects have in recent years been plagued by homogenization. Many projects do not define their own characteristics, instead only imitating existing environmental improvement schemes as well as the management modes of some successful cases. It is different for these projects

to present their advantages and get supports from stakeholders such as the government, developers and others. Project differentiation offers projects greater attention and popularity, both of which play an important role in their sustainable development (Arbab et al., 2020; Liu et al., 2018). Hence, differentiation of urban renewal may help to achieve a high level of stakeholder satisfaction.

#### 1.6. Commercial publicity

Commercial publicity is a type of publicity that has an obvious commercial tendency (Trendel et al., 2018). As a form of commercial publicity, commercial advertisement promotes goods, services or ideas by introducing them to increase consumers' knowledge of goods and desire for their consumption. Commercial publicity is a wide-ranging concept, including traditional TV advertisements, information release, online advertisements, live broad-casts, and some other media (Kariyawasam & Wigley, 2017). With the increasing proportion of new commercial publicity methods in market competition, online commercial publicity, consisting of product endorsements or ratings of online stores, has attracted more and more attention (Zhang et al., 2021b). These online commercial publicity methods are different from traditional commercial advertisements that only inform consumers about the characteristics of goods. Anchors endorsing products might introduce their own products through live broadcast platforms and share their own experience with other participants, offering consumers with a more personal experience. Thus, we consider that commercial publicity is associated with stakeholder satisfaction.

#### 1.7. Project reformation

Project reformation emphasizes not only improving the necessary infrastructure, but also defining representative and distinctive cultural elements and using modern technology to reconstruct objects and scenes of the past (Ho et al., 2012; Zheng et al., 2021; Soares et al., 2022). Projects can be reconstructed through partial demolition, functional replacement and select repairs. Project reformation may optimize regional functions, improve the living environment, and stimulate the vitality of old buildings, which make these buildings enter the public's field of vision again (Wang et al., 2017; Guo et al., 2020). For instance, after reformation, many old streets and buildings can be reused and some related industries with similar cultural background are willing to utilize them at a lower cost compared with establishing new buildings. Therefore, project reformation has an impact on stakeholder satisfaction.

#### 1.8. Incremental innovation

In the present study, incremental innovation mainly refers to innovation in the management and operations of urban renewal projects. Urban renewal needs to adjust the social structure of old areas, change facilities, and improve the

environment to reconstruct the physical space of buildings. In addition, economic benefits, environmental benefits and social benefits should be considered together so as to maximize comprehensive benefits (Liu et al., 2018). Currently, scholars have started to focus on the economic benefits of urban renewal projects (Zhang et al., 2021a). The innovation in the management and operations of urban renewal projects is useful to get sustained economic income. The improvement of economic benefits can directly influence the long-term development of projects (Ye, 2019). The conceptual framework of this research is shown in Figure 1.

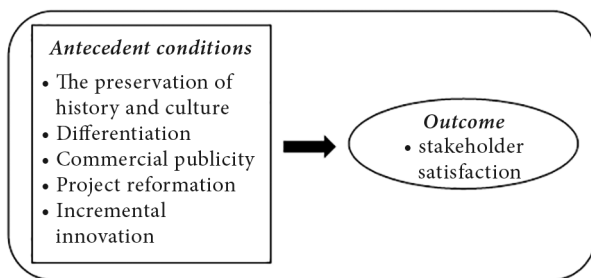


Figure 1. Conceptual framework

## 2. Research method

### 2.1. Analytical method

Qualitative comparative analysis (QCA) based on Boolean algebra and fuzzy set theory has been utilized in many research fields (Ferreira et al., 2016; Greckhamer et al., 2018). In practice, results are combined according to different conditions. The QCA approach provides opportunities to find causal conditions contributing to given outcomes. It means that an outcome might result from various combinations of antecedent conditions (Ragin, 2009; Ferreira et al., 2016).

FsQCA is an accurate and rigorous assessment which involves continuous and interval scale variables. This approach integrates analyses of qualitative research and assessments of quantitative research (Kraus et al., 2018). Both the diversity and heterogeneity of samples can be explored, which enable researchers to compare cases.

FsQCA software is employed in this research. In QCA approach, coverage and consistency are the two main indicators. Specifically, consistency shows the extent to which an antecedent condition constitutes a sufficient condition

of an outcome. Coverage reflects the portion of selected cases in one type of outcome.

### 2.2. Data collection

Urban renewal projects can be quite sizeable, have a significant impact on people's lives, expand consumer demand, and promote economic development. By the end of December 2020, the tasks proposed in Chinese government work report has been complete through the improvement of old building and the utilization of existing re-sources. In many Chinese cities, urban renewal has been vigorously promoted and a number of remarkable results has been achieved. Therefore, we select 31 typical Chinese urban renewal projects that have existed for over 10 years as sample cases.

As for the preservation of history and culture and project reformation, related data is collected by interviewing the respective project designers. The main interview questions to the designers include: (1) Please introduce the historical and cultural background of this project; (2) How were history and culture preserved in this project? Could you please give some examples?; and (3) Please describe the extent of the renewal, whether it was complete or partial.

Data on incremental innovation is collected through interviewing the managers of project operations. The main interview questions to these managers were: (1) Please introduce the operations of this project; and (2) Please describe the operation innovation of this project. Could you please give some examples? The commercial publicity of each sample case was obtained from the Baidu website.

Regarding differentiation and stakeholder satisfaction, data was collected from the 2021 White Paper on Urban Renewal in China (Ke Rui Research Center, 2021), the 2020 White Paper on China Urban Renewal Forum (National Academy of Development and Strategy of Renmin University of China, 2020), the 2019 White Paper on Urban Renewal in China (One Urban Renewal Group, 2019), the 2018 China-UK Urban Regeneration White Paper (International Federation of Finance & Real Estate, 2018), the 2017–2018 China Urban Renewal Development Report (Chinese Society for Urban Studies, 2018), the public Wechat account of China index academy and China urban planning, as well as the website of the Urban Planning Society of China ([www.planning.org.cn](http://www.planning.org.cn)).

Table 1. Values for calibration

Antecedent conditions and outcome	Full membership	Crossover point	Full non-membership
The preservation of history and culture (HC)	5	3	1
Differentiation (DI)	5	3	1
Commercial publicity (CP)	931813.5 (95% quantile)	31459 (50% quantile)	6190.35 (5% quantile)
Project reformation (PR)	5	3	1
Incremental innovation (II)	5	3	1
Stakeholder satisfaction (SS)	5	3	1

### 2.3. Measures

Based on the above sources, we assessed differentiation and stakeholder satisfaction through 5-point scales. The number of terms related to commercial publicity have been obtained from the Baidu website. According to our recorded interview data, the preservation of history and culture, project reformation and incremental innovation were assessed through 5-point scales.

### 2.4. Calibration

In the QCA approach, data should be calibrated into values ranging from 0 to 1, and full membership, full non-membership, as well as maximum ambiguity are needed (Ragin, 2009). According to prior studies (Kraus et al., 2018), Table 1 shows the three values in calibrating process.

### 3. Results

As suggested by Ragin (2009), the present study tests whether any of the five conditions might be the necessary condition of a high level of stakeholder satisfaction. We then address the sufficient conditions by forming a model:  $SS = f(HC, DI, CP, PR, II)$ . The symbol (~) shows the absence of the condition or outcome.

Table 2. Analysis of necessary conditions

Outcome: high level of stakeholder satisfaction		
Conditions tested	Consistency	Coverage
HC	0.670296	0.869492
~HC	0.297175	0.427642
DI	0.876742	0.942857
~DI	0.279181	0.741041
CP	0.529181	0.965052
~CP	0.643728	0.848937
PR	0.675958	0.945189
~PR	0.507840	0.858616
II	0.837543	0.970722
~II	0.346254	0.780177

### 3.1. Analysis of necessary conditions

When computing the presence of necessary conditions, a consistency value of 0.90 or higher can be considered. The necessary tests on each antecedent condition against stakeholder satisfaction show that no condition surpasses the 0.90 consistency threshold (see Table 2). Thus, none of the antecedent conditions in the present study is a necessary condition.

### 3.2. Analysis of sufficient conditions

Truth tables are employed for sufficient condition analysis. We produced a truth table in Table 3. Frequency represents the number of cases containing the combination of causal conditions. For small samples, an acceptable frequency cutoff is usually set at 1 (Kraus et al., 2018). The minimum acceptable consistency threshold is 0.80 (Kraus et al., 2018).

The analysis results of sufficient conditions offer four solutions. Parsimonious solutions and complex solutions include logical remainders and we thus focus on intermediate solutions. In the QCA approach, causal conditions in parsimonious solutions and intermediate solutions are core conditions; those solely showing in intermediate solutions are peripheral conditions (Ragin, 2009). Table 4 presents the causal configurations that lead to stakeholder satisfaction. As shown in Table 4, the solution coverage is 0.708624. In other words, it explains 70.8624% of the sample cases with a high level of stakeholder satisfaction. The solution consistency is 0.998772 and is greater than the minimum acceptable consistency threshold recommended by Ragin (2009).

Solution 1 contains the absence of the preservation of history and culture and incremental innovation, and the presence of differentiation and project reformation. Solution 2 combines the presence of differentiation, commercial publicity, and incremental innovation, and the absence of the preservation of history and culture. Solution 3 includes the presence of the preservation of history and culture, commercial publicity and incremental innovation, and the absence of project reformation. Solution 4 contains the preservation of history and culture, differentiation, project reformation and incremental innovation and the absence of commercial publicity.

Table 3. Truth table for “high level of stakeholder satisfaction”

HC	DI	CP	PR	II	SS	Number	Raw consist	PRI consist	SYM consist
0	1	1	1	1	1	5	1	1	1
1	1	0	1	1	1	4	1	1	1
1	1	1	0	1	1	2	1	1	1
1	0	1	0	1	1	1	1	1	1
0	1	1	0	1	1	1	1	1	1
0	1	0	1	0	1	1	1	1	1
0	1	1	1	0	1	1	1	1	1
1	0	0	0	0	0	1	0.767273	0.356784	0.356784

Table 4. Configuration for stakeholder satisfaction

Conditions	Solution 1	Solution 2	Solution 3	Solution 4
The preservation of history and culture	⊗	⊗	●	●
Differentiation	●	●		●
Commercial publicity		●	●	⊗
Project reformation	●		⊗	●
Incremental innovation	⊗	●	●	●
Raw coverage	0.2399983	0.348868	0.259582	0.396342
Unique coverage	0.0557492	0.171167	0.0740418	0.178571
Consistency	1	0.997509	1	1
Solution coverage	0.708624			
Solution consistency	0.998772			

Notes: ● = the presence of a core condition; ⊗ = the absence of a core condition; ● = the presence of a peripheral condition; ⊗ = the absence of a peripheral condition; blank space indicates “don't care”.

Table 5. Configuration for stakeholder satisfaction

Conditions	Solution 1	Solution 2	Solution 3	Solution 4
The preservation of history and culture	⊗	⊗	●	●
Differentiation	●	●		●
Commercial publicity		●	●	⊗
Project reformation	●		⊗	●
Incremental innovation	⊗	●	●	●
Raw coverage	0.2399983	0.348868	0.259582	0.396342
Unique coverage	0.0557492	0.171167	0.0740418	0.178571
Consistency	1	0.997509	1	1
Solution coverage	0.708624			
Solution consistency	0.998772			

### 3.3. Robustness test

As recommended by Skaaning (2011), this study changed the consistency cutoff thresholds to analyze the robustness of research results. A consistency threshold of 0.85 was used in this step. The robustness analysis results in Table 5 are consistent with the results in Table 4.

## 4. Discussion

Through the use of the fsQCA approach, we find four configurations leading to a high level of stakeholder satisfaction. These pathways can be divided into two types: (1) those with preservation of history and culture (history and culture-led renewal); and (2) those without it (commercial-led renewal). Below we articulate the typical urban renewal cases of these configurations.

The type of cases of Solution 1 usually do not present many historical and cultural connotations, but those projects have been reformed showing great differences. 798 Art District (see Figure 2) is a typical case of Solution 1. It is located in “Beijing North Radio Joint Equipment Factory”, which was built during China’s “First Five-Year Plan”. In December 2000, the original 700, 706, 707, 718,

797 and 798 factories were integrated as a high-tech enterprise. Due to the asset reintegration of the former factories, some properties were idle. In order to make full use of this property, these factories were rented out. Since 2001, artists began to gather in these factories. They make full use of the original factory setting (Bauhaus architectural style from Germany), and carry out decoration and modification activities, turning the park into a distinctive artistic display and creative space. Nearly 200 cultural and artistic institutions have entered this park. These institutions are mainly involved in creation, exhibition and communication, design, and other spaces related to the arts, such as a number of bookstores and restaurants. In 2003, 798 Art District was rated as one of the 22 most culturally iconic urban art centers in the world by Time magazine. In the same year, Beijing was selected as one of the top 12 cities in Newsweek for the first time because 798 Art District turned a waste factory into a trending community. In 2004, Beijing was ranked by Fortune magazine as one of the world’s top 20 cities. Due to the gathering of artists and the influence of Beijing’s Dashanzi International Art Festival, which has been held twice since 2004, the influence of 798 Art District has been increasing. Overall,

this park mainly attracts a number of young people with self-motivation, great interest in culture and art, and great vitality. It is obvious that 798 Art District plays an important role in promoting people's artistic sense and creativity. Its uniqueness such as architectural style and the environment within this art district has also been fully reorganized. It is an established location for cultural exchanges and continuously attracts numerous participants.



Figure 2. 798 ArtDist, Beijing (source: Baidu, 2023a)

Hongyadong (see Figure 3) is a typical case of Solution 2. Hongyadong, which used to be a slum without any distinctive history or culture, is located in the Yuzhong District of Chongqing – a municipality directly under the central government and an international metropolis. After reformation, the main scenic spots of Hongyadong are composed of stilted buildings and antique commercial streets, with a building area of 46000 square meters. In Hongyadong, catering, entertainment, leisure, hotel and cultural shopping are organically integrated and form a unique “three-dimensional aerial pedestrian street”. There are 11 floors and 4 streets: Dynamic Bar Street, Bayu Style Street, Feast Food Street and Exotic Style Street. These four streets mix different elements, showing different themes and distinctive features. Dynamic Bar Street is located on the 5th floor, with global chain bars from more than 30 countries and regions such as Japan, Korea, Italy and Turkey. It is a venue integrating food, entertainment, socialization, business, and shopping. Bayu Style Street, located on the first floor, mainly offers local foods, including some special foods from Chongqing. Feast Food Street is 100 meters long and is paved with bluestone slabs and showcase different foods. It is located on the fourth floor, where famous Chinese and international can be found. Exotic Street, a small part of Hongyadong's overall land-

scape, is located on the 9th and 10th floors, with gourmet restaurants from around the world. Hongyadong offers catering and entertainment, integrates modern trends with Chongqing's folk life, and carries out commercial publicity through short video sharing applications such as TikTok.



Figure 3. Hongyadong, Chongqing (source: Baidu, 2023b)

Solution 3 is exemplified by Li Zhuang (in Cuiping district of Yibin) (see Figure 4), a small town with a population of 12000 located on the south bank of Yangtze River in Yibin main city area, Sichuan Province. Its patchwork wooden attics, narrow alleys paved with bluestone slabs, tall wooden doorsills and heavy wooden doors, ancient houses, and temples have made it well-known throughout China. It is a famous historical and cultural town, with a history spanning nearly 1400 years. Ancient relics mix with modern culture, enabling visitors to experience what life in ancient towns might have been like. The Monument to the Soldiers Killed in the Second Sino-Japanese War, the wartime news agency, the former site of the Society for the Study of Chinese Architecture, Liang Sicheng Square, Tongji Square, etc., offer visitors a perspective of what those conflicts were like. During the Second Sino-Japanese War, Li Zhuang, together with Chongqing and Kunming, became an important cultural center. In 1940, Li Zhuang welcomed more than 10 institutions of higher learning and scientific research, such as the National Tongji University, Academia Sinica, Central Museum and Society for the Study of Chinese Architecture, where numerous scientists gathered. The ancient houses and temples in Li Zhuang are well preserved. In recent years, government and developers have cooperated to build a high-end commercial complex including five-star hotels, folk commercial streets, and high-end homestay clusters



Figure 4. Li Zhuang, Yibin (source: Sichuan Daily, 2023)



near Lizhuang, accelerating Li Zhuang's aim to become a national 5A scenic spot with both cultural connotations and modern facilities. This is very important to enhance the popularity of this project.

The Red Boat of the South Lake is the typical case of Solution 4. Jiaxing South Lake (see Figure 5) is located in Jiaxing, Zhejiang province. The total area of the South Lake is 276.3 hectares, of which the water area is 98 hectares. It is not only famous for its beautiful scenery, but also attracts worldwide attention because the First National Congress of the Communist Party of China was held there. It is a national red tourism spot and one of the hundred patriotic education demonstration sites in China. It is the birthplace of the Communist Party of China and an important revolutionary memorial site in Chinese history. In July 1921, the First National Congress of the Communist Party of China was moved from Shanghai to South Lake due to the invasion of the French Concession police. It was on that red boat that the Communist Party of China was born. In order to commemorate that historical event, a replica boat was built in 1959 (since the original ship disappeared during the Second Sino-Japanese War) and used to portray the birth of the Communist Party of China. The South Lake Revolutionary Memorial Hall, founded in 1959, is the institution that protects and manages the South Lake's meeting site. In June 1991, Jiaxing raised more than 3.6 million RMB to build a new museum for the South Lake Revolutionary Memorial Hall. The memorial hall looks like the emblem of the Communist Party of China, covering an area of 3,800 square meters. The exhibition hall displays historic materials about the First National Congress of the Communist Party of China and some revolutionary cultural relics. In July 2020, this Revolutionary Memorial Hall opened a new experience project combining the 5th Generation Mobile Communication Technology and traditional revolutionary memorial exhibition. Through the use of virtual reality technology, visitors can see a three-dimensional depiction of that original red boat, meeting the increased consumption demands of tourists.



Figure 5. Red Boat, Jiaxing (source: China Daily, 2023)

## Conclusions

Through the use of the fsQCA approach, this research explores the configurations that lead to a high level of stakeholder satisfaction. We find two core antecedent conditions including differentiation and incremental innovation that influence the sustainable development of urban renewal and four configurations leading to the same out-

come. This study extends the knowledge on urban renewal by highlighting the improvements to the economic aspect.

## Theoretical contribution

This study mainly contributes to research on urban renewal from the perspective of sustainable development. First, our study contributes to urban renewal research by uncovering four equivalent pathways to achieve a high level of stakeholder satisfaction. Although previous studies on urban renewal have indicated several antecedent conditions through multiple approaches such as case study and empirical study (Lee & Chan, 2008; Williamson & Ruming, 2019; Ye, 2019), few studies have explored the combined effects of these antecedent conditions. We consider the combination of different conditions and employ the QCA approach to identify four causal configurations, enriching the contribution of existing urban renewal studies (Liu et al., 2018; Porat & Shach-Pinsly, 2021; Ye et al., 2021). In addition, since this study demonstrates the important roles of two core conditions – namely, differentiation and incremental innovation – we also confirm relevant research that shows the pivotal roles of the two antecedents of stakeholder satisfaction (Liu et al., 2018; Ye, 2019; Arbab et al., 2020; Zhang et al., 2021a).

Second, we explore the sustainable development of urban renewal involving management and operational factors, namely incremental innovation. Reviewing existing literature on urban renewal, we find that previous studies mainly focused on the improvement of the environment, paying little attention to the sustainability of regional economic development (Dai & Cai, 2014; Xiang et al., 2018; Cui et al., 2021). In this study, we not only emphasize these antecedent factors involving architecture and urban planning, but also pay additional attention to project management and long-term operations. From the typical cases, we find that incremental innovation in the management and operation of projects can bring about the improvement of economic benefits, helping guarantee the long-term operation of urban renewal projects. The four types of successful cases involving the creative industry, catering and tourism industry, and the cultural tourism industry also confirm that urban renewal projects can only achieve sustainability when comprehensively considering social, economic, and environmental factors.

## Practical implication

This paper also provides some practical implications to achieve the sustainable development of urban renewal. First, this study summarizes some commonalities of sustainable urban renewal projects and also emphasizes the necessity of analyzing economic feasibility before initiating renewal projects. From these typical cases we find that most pathways including the absence of the preservation of history and culture tend to combine the presence of differentiation and project reformation and the absence of incremental innovation (such as 798 Art District) or the presence of differentiation, commercial publicity and

incremental innovation (such as Hongyadong), while the pathways including the presence of the preservation of history and culture usually combine the presence of commercial publicity, incremental innovation and the absence of project reformation (such as Lizhuang) or the presence of differentiation, project reformation and incremental innovation and the absence of commercial publicity (such as the Red Boat).

Second, regarding urban renewal projects with different historical and cultural preservation, practitioners can consider which solution is more appropriate. Regarding history and culture-led renewal, if projects include the presence of preservation of history and culture but lack project reformation, managers may take measures to strengthen commercial publicity and incremental innovation. Through holding various activities such as cultural exchange activities and symposia, commercial publicity can be improved to some extent. As for incremental innovation, operational methods can be diversified by constructing surrounding commercial areas and enriching tourism consumption contents. When projects include the presence of the preservation of history and culture but lack commercial publicity, managers can consider strengthening differentiation, project reformation and incremental innovation. Like the Red Boat in South Lake, its history and culture has attracted numerous customers and there is no need to conduct commercial publicity. The project manager makes full use of history and cultural connotations to showcase differentiation. Meanwhile, museums and other functional spaces can be expanded around projects so as to make tourists better understand the history, while also publicizing the whole project. The improvement of customer experience as an important part of incremental innovation might be achieved through the use of advanced technology (e.g., virtual reality technology). As for commercial-led renewal, if projects lack the preservation of history and culture and incremental innovation of operational methods, managers should try to define distinguishing aspects in their projects and pay more attention to project reformation. From the case of 798 Art District, we find that urban renewal can promote the development of the cultural and creative industry. The opportunities presented by the development of the creative industry and those presented by urban renewal are inseparable and form a symbiotic relationship. These once unremarkable old factories and historic blocks have become the “crowning touch” of the development of the cultural and creative industry. The original workshops, warehouses and historic buildings have been reformed by artists. These companies contributing to creative design gather together and gradually form industrial chains, and subsequently other industries such as catering and service industries can drive the coordinated development of regional tourism, real estate and other related industries. In addition, when projects have been reformed but there is an absence of preservation of history and culture, managers should focus on differentiation and on incremental innovation. It is evident that differentiated projects that

continuously innovate their operational methods are more likely to maintain sustainable development.

Third, this study suggests that managers should pay attention to incremental innovation in their project operations. From the perspective of operation and management, we find that many renewal projects can operate successfully in an early stage. However, due to the lack of professional management teams, it is difficult for some projects to maintain that performance in the long term. Operation innovation is important to get sustained economic benefits. The balance of social, economic, and environmental aspects is conducive to meeting the needs of multiple stakeholders. At present, China's cities are in the process of rapid modernization and transformation. At the same time, in some ancient cities, the historical and humanistic ecological communities that have already existed and merged with history are in an urgent need of protection. In the context of the national strategy for promoting high quality of new urbanization projects, the urban development mode is gradually shifting from the expansion of scale to the upgrading of quality. Improving the functions of urban projects and achieving long-term development have become important aspects of urban renewal.

### Limitations and future research

Some limitations also encourage future research. First, we collected 31 urban renewal sample cases from China, and it remains to be confirmed whether the results also apply to other regions. Researchers can expand sample size and compare their results with this paper. Second, according to previous literature and our observation on the phenomenon of urban renewal, five antecedent conditions were selected. Conditions from different perspectives could also be considered in future research. Additionally, from a sustainability view, we investigate urban renewal projects. Although the results of this study are insightful, we recognize that other perspectives could potentially be considered. Although detailed comparisons with other approaches were beyond the scope of this study, the potential value of such comparisons seems clear, and we encourage such future research. A vibrant stream of research that elaborates on the sustainability of urban renewal will contribute to their development.

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