



# Fuzzy evaluation of comprehensive benefit in urban renewal based on the perspective of core stakeholders



Yousong Wang<sup>a</sup>, Jianfeng Li<sup>a, b, \*</sup>, Guilin Zhang<sup>a</sup>, Yakun Li<sup>a</sup>, Martin Henry Asare<sup>a</sup>

<sup>a</sup> School of Civil Engineering and Transportation, South China University of Technology, Guangzhou, Guangdong, 510640, China

<sup>b</sup> Architectural Design and Research Institute of Guangdong Province, Guangzhou, Guangdong, 510010, China

## ARTICLE INFO

### Article history:

Received 8 March 2017

Received in revised form

19 May 2017

Accepted 5 June 2017

### Keywords:

Urban renewal

Stakeholders

Comprehensive benefit

Evaluation system

Fuzzy evaluation

Factor analysis

## ABSTRACT

This paper chooses government, resident and developer for the core stakeholders of the urban renewal who can affect the realization of the urban renewal objectives during the whole life cycle of the urban renewal construction. Based on the analysis of literature summary about urban renewal, this paper confirms 30 influence factors of comprehensive benefits in urban renewal through the questionnaire. The evaluation index system of 16 factors containing three subsystems of government benefits, resident benefits and developer benefits is established through factor analysis theory. Entropy method was then used to assign weights on criteria and macro-criteria. The weights of government, residents and developers are respectively 0.343, 0.386, 0.271. Then an evaluation model of urban renewal comprehensive benefit is put up. Fuzzy theory is used to calculate the evaluation values of Lieder village renewal in Guangzhou and the evaluation result shows that the comprehensive benefit evaluation of Lieder village renewal is good. The result is accord with actual. It has a certain practical value for the evaluation model used on the comprehensive benefit evaluation of urban renewal.

© 2017 Elsevier Ltd. All rights reserved.

## 1. Introduction

Urban renewal is commonly adopted in China with high-speed development of urbanization, associated with different stakeholders and compensation for demolition and resettlement, resulting in value conflicts in projects. The key of performing urban renewal is to achieve interests and goals of stakeholders. However, urban renewal is a comprehensive problem involving many aspects. Study of balancing interests and benefits of stakeholders, aiming for sustainable development, is significant to completing urban renewal successfully. Based on literature review, 30 comprehensive evaluation factors of urban renewal benefits are defined. After collecting data from questionnaires, assessment system, characterized by three dimensions of government benefits, resident benefits and developer benefits, is proposed using factor analysis method. Meanwhile, assessment model of determining

weights for core stakeholders is built by entropy weight method. As a result, assessment system and assessment model can provide a theoretical basis for the implementation of urban renewal evaluation, but also provide a basis for decision-making of urban renewal model selection.

## 2. Literature review

Indicator-in-use method is commonly emphasized by researchers in establishing urban renewal evaluation framework (Wong, 2000). LI Jun-jie brought through an assessment system for old city reconstruction, based on residents' satisfaction and social harmony. It is used by fuzzy comprehensive evaluation (Li, Zhang, & Liu, 2009). LEI Ting, HU Yue-ming et al. built an assessment framework according to deep analysis on the "three olds" reformation in Gaozhou City, including the social, economic and ecological benefits (Lei, Hu, Wang, & Wang, 2012). ZHONG Yun, CAO Yan analyzed land use efficiency of 'three old' districts from economic, social and environmental aspects, taking the North Shore Culture Pier of Guangzhou as an example under urban renewal (Zhong & Cao, 2013). LIU Jingjing designed a comprehensive assessment system of sustainable urban renewal based on the sustainable city, and put forward five measures to obtain the

\* Corresponding author. Room 7205, Building No. 7, South China University of Technology, 381st Wushan Road., Tianhe District, Guangzhou, China. Tel.: +86 13380079656.

E-mail addresses: [yswang@scut.edu.cn](mailto:yswang@scut.edu.cn) (Y. Wang), [ljfeng@gdadri.com](mailto:ljfeng@gdadri.com) (J. Li), [597483090@qq.com](mailto:597483090@qq.com) (G. Zhang), [1258279522@qq.com](mailto:1258279522@qq.com) (Y. Li), [marhensare@yahoo.com](mailto:marhensare@yahoo.com) (M.H. Asare).

comprehensive benefits of sustainable development (Liu, 2014). LIU Jingkuang, LI Jianfeng et al. constructed an index system framework of comprehensive benefit based on the angle of view for sustainable development. The index system provided theoretical basis for evaluating the reconstruction of old factory buildings, old villages and old towns (Liu, Li, & Zhu, 2015). Hemphill proposed a hierarchical model of urban renewal evaluation to analyze the sustainability of urban renewal, using the Delphi method and multiple criteria (Hemphill et al., 2002). Brindley and Bromley argue that urban renewal should be with social sustainability (Brindley, 2003; Bromley, Tallon, & Thomas, 2005). RÉMI DORMOIS et al. pointed out that the use of public-private partnership (PPP) models in urban renewal projects in France is less of a social concern (Rémi, Gilles, & Hélène, 2005). Lee used the AHP method to evaluate old city transformation to solve decision-making problem of society, government and developer (Lee Grace & Chan Edwin, 2008a). Lee and Edwin established a sustainable urban renewal assessment model in terms of economic, social and environmental benefits, taking Hong Kong Urban Renewal Project as an example (Lee Grace & Chan Edwin, 2008b). Edwin defined the key factors for improving sustainability of urban renewal projects by questionnaire survey (Chan & Lee Grace, 2008). Yusuf applied the artificial intelligence technology to the environmental impact assessment of urban renewal based on fuzzy logic (Yusuf, Georgakis, & Nwagboso, 2009).

Because of complexity of environmental, social and economic problems added to the uncertainty, many scholars advocated dominated by the index system of evaluation methods to evaluate urban renewal projects. However each scholar application evaluation method has diversity and differences, there is no consistent evaluation model. For comprehensive evaluation, the researchers often use methods as follow: Delphi method, Entropy Value method, Expert Grading method, Factor Analysis (FA), Principal Component Analysis (PCA), Analytic Hierarchy process (AHP), Analytic Network Process (ANP), TOPSIS method, ELECTRE method, Data Envelopment Analysis (DEA), Artificial Neural Network method, Expert System Evaluation method, Grey System Decision-making Evaluation method, and the integrated use of various methods, and so on.

The Chinese scholars mainly research urban renewal mode and economic benefit. Base on the sustainable theory, they put up evaluation model to evaluate urban renewal projects. Their research promoted the sustainable development of Chinese cities. Many other countries' scholars focus on urban renewal sustainability, and establish a relatively complete evaluation index system. The scholars mainly study the benefits of urban renewal from various angles, but the research is not comprehensive. They only focus on one aspect of the benefits, such as social benefits or economic benefits. Fewer scholars research urban renewal from the perspective of interest equilibrium and the research is less of comprehensive benefits. Absorbing the research experience of many scholars, this paper builds evaluation index system of urban renewal comprehensive benefit based on the perspective of core stakeholders and puts up an evaluation model which is used in comprehensive evaluation of urban renewal projects.

### 3. Stakeholders and their interests of urban renewal

The stakeholders of the urban renewal can be defined as a group or individual who can affect the realization of the project objectives during the whole life cycle of the urban renewal project construction and operation (Yan, Yue, & Hao, 2014). According to this definition, the stakeholders of urban renewal mainly include government, residents, developers, design units, construction units, financial institutions, suppliers, research institutes, the public and

the news media. According to the characteristics of different degree of difference among stakeholders expressed in the initiative, the urgency of the realization of benefits, the importance to the whole activities, we can divide the ten types of urban renewal stakeholders into the core stakeholders and secondary stakeholders (Chen, 2003). Therefore this paper selects the government, the residents and the developers as core stakeholders. The key of urban renewal is balancing their interests.

#### 3.1. Government interests

Government is the policy makers of urban renewal with responsibility of achieving society benefits, aiming for eliminating the problems caused by the old city, promoting the development of urbanization, enhancing the image of the city, promoting the rational distribution of public interests, maintaining social harmony and stability, maximizing social welfare and coordination of urban economic development and improving government prestige and financial income.

#### 3.2. Residents interests

Residents hope to get rid of dirty, smelly and chaotic security living environment, and increase rental after improving the environment, protect future basic living and economic interests. Therefore, residents are more concerned about the urban renewal of the relocation compensation, social security, the source of life and follow-up development. That can be summarized as the survival and development interests.

#### 3.3. Developers interests

Developers not only provide the necessary funds to update, but also have a good opportunity to establish enterprise brand and image. Their participation goal is to obtain lucrative economic returns. The decisive factor of involving urban renewal is whether they can obtain a reasonable profit and enhance the visibility of enterprises. Developers are mainly concerned about the effectiveness index of the profitability.

## 4. Evaluation influence factors analysis

### 4.1. Evaluation index selecting principle

Index System is the carrier of the content of comprehensive benefit evaluation of urban renewal. For the design of indicators, Maclaren proposed that the choice of evaluation indicators should follow the following principles (Maclaren Virginia, 1996):

- (1) Scientific and feasible. Truly reflecting the connotation of comprehensive benefit of urban renewal, collection of data should be based on objective fact, and easy to acquire and control. Data processed should be regulated in order to ensure the data sources scientific and accuracy.
- (2) Systematic and integrity. Selecting metrics should consider direct and indirect impact. From the perspective of the overall and systematic, it should comprehensively evaluate the characteristics of the object and the overall situation of urban renewal.
- (3) Representative and independent. Index system must be excluded as much as possible strong correlation index, the representative and independent indicators should be involved in the evaluation process.

Download English Version:

<https://daneshyari.com/en/article/5114637>

Download Persian Version:

<https://daneshyari.com/article/5114637>

[Daneshyari.com](https://daneshyari.com)