



Urban design for post-earthquake reconstruction: A case study of Wenchuan County, China



Lixiong Liu^a, Yanliu Lin^{b,*}, Shifu Wang^a

^aState Key Laboratory of Subtropical Building Science, School of Architecture, South China University of Technology, Guangzhou 510640, China

^bSpatial Planning Section, Faculty of Geoscience, Utrecht University, Willem C. Van Unnik building (Office: 420C), Heidelberglaan 2, 3584 CS Utrecht, the Netherlands

A B S T R A C T

Keywords:

Urban design
Post-earthquake reconstruction
Strategies
Safety
Institutional arrangements

Urban design for post-earthquake reconstruction emphasizes strategies, safety, memorials and institutional arrangements. It is closely related to earthquake recovery plans. This article reviews general studies on urban design for post-earthquake reconstruction, before focussing on the case of Weizhou Town in Wenchuan County, which in 2008 was severely damaged by a magnitude-8 earthquake. Unique institutional arrangements, however, led to a rapid recovery and reconstruction process. The urban design for post-earthquake reconstruction in Weizhou Town was an integrated approach that promoted both long-term and short-term developments and combined the creation of public space with the provision of public facilities. It created four interwoven systems, namely a safety system, a memorial system, a tourism system and a network of open spaces. This study shows that the urban design for post-earthquake reconstruction in Weizhou Town greatly improved the safety and vibrancy of the town, whereas the top-down approach and the rapid reconstruction process resulted in new problems.

© 2013 Elsevier Ltd. All rights reserved.

Introduction

On 12 May 2008, a magnitude-8 earthquake hit Sichuan Province, causing catastrophic damage. Wenchuan County was the epicentre of the quake and thus one of the most severely hit areas. The county covered an area of 4084 km² and had a population of 106,119 in 2005. The earthquake devastated the local people's livelihood. It caused 15,941 deaths and injured 34,583 persons; 7474 persons were missing (Song & Hu, 2008). Over 70% of the buildings were destroyed or devastated; 200,000 houses collapsed and 300,000 were badly damaged (interviews with officers in Wenchuan County, 2008). Public facilities and the county's infrastructure, such as hospitals, schools and roads, were severely damaged. The local industry was wrecked and about 80% of the farmland was damaged. Some put the economic loss at more than RMB 100 million (±GBP 1 million/EUR 1.25 million) (Guo, 2008).

There were many challenges for urban design and planning for post-earthquake reconstruction in Wenchuan County. The areas affected by the earthquake had to be restored or reconstructed as soon as possible. New homes and facilities for the habitants had to

be provided, while also promoting long-term economic development. A new urban form that was safer and more resilient to disasters had to be created. A top-down approach was applied to deal with these challenges. It was related to the counterpart support plan established by the State Council of the People's Republic of China in 2008. Guangzhou City in Guangdong Province was assigned as the corresponding city to support the post-earthquake reconstruction of Weizhou Town. Through unique institutional arrangements and a huge investment from Guangzhou Municipal Government, Weizhou Town experienced a rapid recovery and reconstruction processes. The urban design for the reconstruction of Weizhou Town was embedded in the town's Earthquake Recovery and Reconstruction Plan. It was a future-oriented integrated approach that promoted both long-term and short-term developments and combined public spaces with public facilities. It created a new urban form that was safer and more resilient to disasters and greatly enhanced the quality of life in the town. The top-down approach and the rapid reconstruction process, however, created new problems.

The existing literature mainly focuses on housing reconstruction after earthquakes (Steinberg, 2007; Tanaka, Benjamin Abramson, & Yamazaki, 2009) and on earthquake or disaster recovery plans (Foster, 1980; Han, Ge, & Cheng, 2008, pp. 21–23; Healy, 1969; Hu, 2008; Murphy & Bayley, 1989). Urban design for post-earthquake reconstruction has received little academic interest. The present

* Corresponding author. Tel.: +31 302533739.

E-mail addresses: lewlx@126.com (L. Liu), yanliu_lin@hotmail.com, y.lin@uu.nl (Y. Lin), archcity@scut.edu.cn (S. Wang).

study is an attempt to bridge this research gap through literature studies and a specific case study. This article presents a general literature review on urban design for post-earthquake reconstruction and its relationships with earthquake recovery plans, and then focuses on a case study of Wenchuan County, China. The conclusion is that research and practices in this field should pay particular attention to institution, design process and mixed land use.

The materials for the case study were mainly collected during two intensive periods of fieldwork, the first of which was in 2008–2010. This research surveyed Weizhou Town by means of questionnaires, semi-structured interviews, site visits, observations, photographs and mapping. In order to understand the requirement intent of residents for post-earthquake reconstruction, 150 copies of questionnaires were distributed in 3 main neighbourhoods of the county town in 2008. With the assistance of local governments, the overall rate of successful interviews was higher than 95%. In the questionnaire, there was a series of questions, ranging from construction priority to economic conditions. A number of face-to-face semi-structured interviews with residents and representatives of public authorities were also conducted to understand the extent of the damage and development issues of the town. Furthermore, the authors were involved in a design competition that led to the formulation of the ‘Urban Design for the Reconstruction of Weizhou Town’ (2009). Questionnaires were also sent to 6 design units which were involved in the urban design project and the recovery plan to know expert’s opinions on the design process. Moreover, many internal documents (e.g. policies, reports, and urban design and planning documents) were obtained from the Guangzhou Aid Working Group. The second period of fieldwork was in 2013. The authors visited the newly-established public spaces and buildings in the town, and conducted several semi-structured interviews with the town’s inhabitants and representatives of public authorities to understand the utility of the newly-established public spaces and buildings as well as the new urban dynamics. Based on these two periods of fieldwork, the article analysed and evaluated the urban design for post-earthquake reconstruction in Weizhou Town.

Literature review: urban design for post-earthquake reconstruction

Urban design is a matter of collaboration between various disciplines, resulting in three-dimensional urban forms and an enhancement of the quality of urban life (Waterman & Wall, 2009). The “quality of life” associated with the built environment includes not only the physical characteristics of the place, such as the diversity of open space (Allan & Bryant, 2010), but also the social attributes of the environment, such as the sense of neighbourhood (Chapman & Larkham, 2007), increased vitality and safety, available amenities and facilities (Carmona, De Magalhaes, Edwards, Awuor, & Aminossehe, 2001). Contemporary urban design theories are concerned with shaping city and urban spaces to encourage social activities within the urban fabric, create positive social interactions, satisfy ecological needs, mitigate the negative effects of urbanization and promote economic growth (Clancy, 2011). The key principles of such theories include places for people, enriching the existing, making connections, working with the landscape, mixing uses and forms, managing the investment and designing for change (Davies, 2007). Some recent urban design literatures also focus on vision development, strategy-making and the role of key stakeholders in the production of space (Lin & De Meulder, 2012; Salet, 2006).

These urban design theories have become the foundation of urban design for post-earthquake reconstruction. It should be recognized however, that urban design for post-earthquake

reconstruction is closely related to earthquake recovery plans, which emphasize safety and long-term development. Earthquake and other disasters can cause serious damage to the spatial forms in which economic activities and social networks are embedded. Urban design for post-disaster reconstruction is an opportunity to create a new urban form that is safer and more resilient to disasters, as well as to develop strategies for promoting economic development and enhancing the quality of life in urban areas. Urban design also pays attention to the emotional and psychological needs of those who lost their families or were injured during the earthquake. Moreover, the design and planning process is strongly influenced by institutional arrangements and the role of key stakeholders. In sum, urban design for post-earthquake reconstruction emphasizes strategies, safety, memorials and institutional arrangements.

For planning purposes, disasters can be classified into four stages, namely assessment, warning, impact and recovery (Foster, 1980). The recovery process can take decades, depending on local conditions, and requires a large amount of funding and federal or even international assistance (Murphy & Bayley, 1989). The recovery stage can be divided into four periods: the emergency period, which lasted until the essential services had been restored and the danger of secondary effects (e.g. earthquake aftershocks) had passed; the restoration period, during which refugees returned and normal economic and social activities resumed; the reconstruction period, during which the destroyed facilities were rebuilt and living conditions were improved through redevelopment; and the final betterment and commemorative period, in which a new and improved community fashioned from the rubble of its predecessor arose, something that is often noted on monuments commemorating the disaster as a turning point in local history (Murphy & Bayley, 1989). A disaster recovery plan is usually made for the recovery stage. Urban design for post-earthquake reconstruction is properly embedded in a disaster/earthquake recovery plan. It is related to the third and fourth periods of the recovery stage.

Visions and development strategies are often developed in urban design for post-earthquake reconstruction (Ciborowski, 1982). For example, the urban design for post-earthquake reconstruction in three neighbourhoods of Nagata Ward addressed both short- and long-term visions for specific sites and the entire study area of each neighbourhood (Tanaka et al., 2009). Driven by the economic restructuring and deindustrialization on the global scale, the growth of tourism has been stimulated worldwide as an urban redevelopment strategy that is adopted by cities in their post-disaster redevelopment processes (Qu, 2011).

The theme of “urban safety” encompasses a wide range of concerns and issues, from basic needs through impacts of natural disasters (such as earthquake) to collective security needs (UN-HABITAT, 2007). A renewal programme for old urban fabric must offer higher levels of safety and earthquake resistance, through limiting vulnerability of urban fabric, components and structure, building in effective systems of preparedness for a catastrophe, and facilitating emergency and post-disaster rescue operations (Ciborowski, 1982). Urban design in earthquake-prone areas should ensure the safety of a city as a whole, the safety of all urban interiors and their occupants, and the safety of the operational capabilities of the settlement as a functional entity (Ciborowski, 1982). In order to prevent or mitigate disaster damage, urban design measures should include: safeguarding the operational capacity of major components of transport routes (streets, intersections, squares) against being blocked by falling debris; green and open spaces as evacuation routes and evacuation zones; and emergency exit routes from inner-city blocks (Ciborowski, 1982). However, the requirement to provide safe refuge and recovery in times of emergency is sometimes at odds with the needs of liveable cities (Allan & Bryant,

Download English Version:

<https://daneshyari.com/en/article/1047870>

Download Persian Version:

<https://daneshyari.com/article/1047870>

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