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TOWNS UNDERGOING CHANGES: A CASE STUDY
ON THE RECOVERY AFTER THE WENCHUAN EARTHQUAKE, CHINA

BY

WENJING JIANG

THESIS

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Master's Committee:

Professor Robert B. Olshansky, Adviser
Assistant Professor Yu Xiao, Texas A&M University

ABSTRACT

Post-disaster recovery is a complicated and dynamic socio-economic-political process, with time compression as the key feature that differentiates it from normal development procedures. The devastating Wenchuan Earthquake in China occurred on May 12, 2008, and its recovery process provides a unique case for post-disaster recovery research with its rapid reconstruction under a government-led top-down process, in particular a national counterpart assistance program. How did they recover so quickly? What were the accomplishments and risks under the tight time constraints? What decisions were made locally and by whom? And what were the key factors influencing speed and deliberation during the whole process?

This thesis conducts a case study of Shuimo in Wenchuan County to address these questions. Based on a multi-disciplinary approach, this research has identified achievements in physical recovery, economic recovery, environmental improvement, and landscape enhancement. However, the top-down political system entitled the assistance groups as outsiders more power than local residents and officials in the decision making process, creating some potential costs to the disaster affected area, including a lack of consideration to the details of physical recovery, previous lifestyles, normal educational activities, and the local value systems. In addition, the recovery caused potential regional inequities, which should draw the attention of policy makers. Despite all these uncertainties and questions unanswered, there are several lessons we can learn from this case: (1) The counterpart assistance system can address the needs of both speed and quality and it can allow both knowledge sharing and innovations in post-disaster recovery, but policy makers should adjust the design of such programs in the future according to the situation at hand.; (2) Post-disaster recovery planning can be powerful in financing reconstruction projects, yet a powerful planning process might lead to potential social costs for localities, calling for careful use of it; (3) Planners should use their power to attract external resources, be innovative to balance speed and deliberation, and address the mismatch between local needs and outsiders' visions during the recovery planning process.

To those who suffered from the Wenchuan Earthquake on May 12, 2008.

ACKNOWLEDGEMENT

When the Wenchuan Earthquake happened in 2008, I was still a freshman, not yet choosing my major. The instructors of the introductory courses in urban studies and planning were telling stories about how professors and designers at Peking University got involved in the post-disaster recovery planning. But I never imagined that one day, today as six years later, I would be researching and writing on this topic.

All this started almost three years ago when I accidentally met Dr. Robert Olshansky, who later introduced me into the research of post-disaster recovery planning and deserves my foremost thankfulness. As my adviser, he gave me tips on how to survive graduate school by sharing with me his own experiences and his observations on his graduate students in the past. As my supervisor, he respected my own working pace and gave me thorough trust on my work. Among all those moments I was inspired after talking to him, I was the most moved by his deep understanding in Asian cultures as an American and his wisdom of life in how to do our best given all the constraints we have. Without his spiritual support, it would be a much tougher journey to complete the two-year program and this thesis.

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Four months ago, when I formally started the writing process and learned that “the Foshan Assistance Group did not even move a shovel of soil” for the first seven months in the post-disaster recovery in Shuimo (H. Liu, 2011, pp. 31-33), I wrote a note in my draft right beside this detail: “this is exactly how I have been working on my thesis”. Now as I am close to the end of this research, I am quite clear that the two processes are of so much difference. Jumping out of the analytical thinking and the perspective of recovery planning research, I personally admire the accomplishment of the Foshan Assistance Group and the construction workers in Shuimo, as well as many other participants who faced similar obstacles in other towns and ultimately completed

their tasks. Despite any political or economic factors, these people risked their careers and even lives, fighting for others (and themselves). I owe my respect to all of them.

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CHAPTER 1 INTRODUCTION

1.1 Overview on the 2008 Wenchuan Earthquake

On May 12, 2008, an Ms 8.0 earthquake¹ struck Wenchuan County in the southwest of China and resulted in “the widest affecting scope and most serious disaster-induced losses ever since the founding of the People’s Republic in 1949”² (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 8). With a focal depth of only 19 kilometers (11.875 miles)³, the epicenter intensity reached 11 degrees on the Modified Mercalli Intensity (MMI) scale⁴, indicating the great destructive powers of the disaster (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 8; J. Xu & Lu, 2012, pp. 202, Table 201; Yong & Booth, 2011, pp. 3, 11, 52-69). Beyond the over 30,000 aftershocks, the Wenchuan Earthquake also induced a number of secondary disasters, including landslides, landslips, mud-rock flows, barrier lakes, etc. (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 8; Xing & Xu, 2011, p. 16).

Since the epicenter of the Wenchuan Earthquake was in Sichuan Province, one of the most populous regions in China with a large proportion of rural and mountainous area, the quake caused heavy casualties and posed difficulties to rescue and recovery. By August 25, 2008, some 69,226 people lost their lives during the Wenchuan Earthquake, 374,643 were injured, and

¹ M 8.0 represents surface wave magnitude (Ms), or the Richter scale in magnitude used by the Chinese government (Chang, Wilkinson, Potangoroa, & Seville, 2010; State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 8; Yong & Booth, 2011, pp. 3, 52-69). The moment magnitude (Mw) for the Wenchuan Earthquake was M7.9, according to the United States Geological Survey (USGS), as retrieved from <http://earthquake.usgs.gov/earthquakes/eqinthenews/2008/us2008ryan/>

² The Wenchuan Earthquake affected more than 417 counties (cities, districts), a region of around a half million square kilometers in 10 provinces in China (State Council of the PRC, 2008b).

³ The distances are converted by the equation of “1 mile = 1.6 kilometers = 1,600 m”. Conversion results will be provided in parenthesis only when necessary in this thesis. The number of 19 kilometers comes from the USGS webpage: <http://earthquake.usgs.gov/earthquakes/eqinthenews/2008/us2008ryan/>

⁴ Or 11 degrees measured by the China Seismic Intensity Scale (CSIS), a national standard (similar as the MMI scale) used in China to measure seismic intensity ranging up to 12 degrees (X. Dong, 2012, p. 25; Yong & Booth, 2011, p. 4). The Ministry of Housing and Urban-Rural Development (MOHURD) set up the building codes based on the CSIS and required buildings to meet certain standards of seismic fortification (X. Dong, 2012, p. 46). Seismic intensity and fortification will apply the CSIS later in this thesis, if not specified otherwise.

17,923 missing⁵ (State Council of the PRC, 2008b). Direct economic losses for the most severely affected 51 counties (cities, districts)⁶ amounted to 843.8 billion yuan⁷ (approx. 124.1 billion US dollars), among which 96.2 billion yuan (approx. 14.1 billion US dollars) from industrial enterprises and 40.4 billion yuan (approx. 5.9 billion US dollars) from agriculture (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 10). A large number of lifelines and public facilities (34,125 kilometers of highway, 1,263 reservoirs, 61,524 km of transmission lines, 250 substations above 35 KV, 7,444 schools, 11,028 medical institutions) were devastated, together with numerous urban and rural residences⁸ (Chang et al., 2011, p. 741; State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, pp. 10-11). In addition, the disaster affected area is home to many ethnic minority groups (Qiang, Yi, Tibetan, Naxi, etc.), posing great challenges for the social and cultural recovery (J. Xu & Lu, 2012, p. 200; Yong & Booth, 2011, pp. 11, 18-19).

⁵ The numbers vary in different sources estimated at different time points. For example, according to a previous version of the state plan, the earthquake resulted in 69,222 deaths, 374,638 injuries and 18,176 missing (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 8). Here I refer to the finalized version of the State Overall Plan, as a couple of other scholars did in their reports (Chang, Wilkinson, Brunson, Seville, & Potangaroa, 2011, p. 740; Yong & Booth, 2011, p. 3).

⁶ These 51 counties (cities, districts) were defined by the Central People's Government of the People's Republic of China as the planned area of the State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008). This scope of planned area will be referred to as the general "disaster affected area" in the following part of this thesis, if not specified otherwise.

⁷ The RMB "yuan" is unit of the Chinese currency symbol. Despite the changing currency exchange rate, this thesis will adopt an exchange rate of "1 US dollar = 6.8 yuan" to provide an approximate amount of US dollars in parenthesis following the exact amount of RMB yuan.

⁸ As above, these numbers only covered statistics from the 51 most severely affected areas in Sichuan, Gansu and Shaanxi Provinces. Collapsed urban and rural residences amounted to 18.9 million square meters (203.4 million square feet) and 107.1 million square meters (1.15 billion square feet), respectively. Severely damaged urban and rural residences were 58.4 million square meters (628 million square feet) and 94.3 million square meters (1.01 billion square feet), respectively. Conversion between units is based on the equation of "1 square meter = 10.764 square feet".

1.2 The Post-disaster Recovery and Restoration

The recovery and restoration process after the Wenchuan Earthquake was led by the Central People's Government of the People's Republic of China (PRC)⁹ through a top-down approach. A series of national policies and plans initiated by the Central Government acted as instructions to the general recovery and thereby were implemented by the government units at lower levels. The counterpart assistance program¹⁰ stood out among national policies addressing post-disaster recovery needs from international experience (T. Liu, 2010). In this section, I will start with an overview of the policies made by the Central Government, and then introduce how the national counterpart assistance program (NCA) was designed to address some of the challenges following the Wenchuan Earthquake. Some facts about the overall progress as well as that in Wenchuan County will provide readers with a hint on how the policies worked in the post-disaster recovery.

1.2.1 Government-led Recovery Process

The Central Government responded quickly after the Wenchuan Earthquake, and they established a Wenchuan Earthquake Rescue and Relief Headquarters (WERRH) almost immediately after the quake (X. Dong, 2012, p. 25). In order to direct post-Wenchuan Earthquake recovery and reconstruction (PWERR), on May 23, 2008, a special team¹¹ was also established to formulate plans at the national level, under the joint leadership of the State Council, the National Development and Reform Committee (NDRC), Ministry of Housing and Urban-Rural Development (MOHURD), and the People's Government of affected provinces (X. Dong, 2012, p. 26; J. Xu & Lu, 2012, p. 201; Yong & Booth, 2011, p. 224).

⁹ Also referred to as “the state” in other articles or “the Central Government” later in this thesis. “State policies” refer to policies made or adopted by the Central Government. For an explanation of the governance units and an introduction to the organization of administrative system in China, refer to Appendix A and Appendix B.

¹⁰ Also known as “pair assistance program”, “national counterpart assistance model”, etc. I adopt the term from the State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008).

¹¹ Translations of the name of the special team differ in different articles, including “the Planning Group for Post-Wenchuan Earthquake Restoration and Reconstruction” (Yong & Booth, 2011, p. 224), the State Council Post-Earthquake Reconstruction Office (SCPERO)(J. Xu & Lu, 2012, p. 201), etc. In this thesis, I adopt the term of “State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction” (SPG-PWERR), as used in the official government document (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008).

On June 8, 2008, the State Council released the “Regulations on Post-Wenchuan Earthquake Recovery and Reconstruction”, also the first regulation for the PWERR in China, and also enacted the Wenchuan Earthquake Disaster Recovery and Reconstruction Act (WEDRRA) (X. Dong, 2012, p. 27; Dunford & Li, 2011, pp. 998-999; J. Xu & Lu, 2012, p. 201). Three days later¹², on June 11, 2008, the State Council decided to pair each of the 19 selected provinces (cities) with one severely affected county (municipality, district) and form the counterpart assistance program. The pairing decision was made based on the financial conditions of the assistance provinces and the damage conditions of the counterpart counties, and the assistance provinces were asked to offer no less than one percent of their last ordinary budget revenues for a period of three years¹³ (State Council of the PRC, 2008a; Xia, 2013, p. 8; Yong & Booth, 2011, p. 230). Although the State Council printed out this proposal and sent it out to the government bodies at lower levels at this time, the Plan of Counterpart Assistance Program for Post-Wenchuan Earthquake Recovery and Reconstruction (PCAP-PWERR) was not finalized and officially adopted until one week later on June 18, 2008, and further required all Departments of the Central Government to save five percent of their budget as funding to aid the disaster affected area (X. Dong, 2012, p. 27; Jiang, p. 23).

Two months later, on August 11¹⁴, 2008, the draft of “The State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction” (SOP-PWERR) was released to the public for their opinions (Dunford & Li, 2011, pp. 998-999; State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008; J. Xu & Lu, 2012, p. 201; Yong & Booth, 2011, p. 224). This plan expanded the counterpart counties to 24 counties (municipalities, districts) in total,

¹² This was within one month after the earthquake.

¹³ The assistance provinces (cities) were aid-provision government units, while the counterpart counties were aid-reception government units, as defined by the State Council. Some articles refer to annual gross domestic product (GDP) as the standard of calculating minimum amount of capital assistance (Chang et al., 2011, p. 746), yet here I keep accordance with the State Overall Plan (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 116).

¹⁴ The dates vary from different materials, ranging from August 11 through August 18. Here I use the date of August 11 from the Draft of the Plan I refer to.

adding a couple of counties in Gansu and Shaanxi Provinces¹⁵ (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 116). It also defined the planned area into three zones according to the suitability and future vulnerability—areas suitable for reconstruction, areas suitable for appropriate reconstruction, and ecological reconstruction areas—which offered policies for industrial relocation in the region and later the residential resettlement at local scales (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, pp. 24-27). The final official edition was publicized on September 19, 2008¹⁶, in which major goals and the responsibilities of assistance government units were clarified and the top priority was given to restoring residences, public facilities and infrastructure (Chang et al., 2011, p. 742; P. Xu, Lu, Zuo, & Zhang, 2014, p. 431). Later on October 14, 2008, the WERRH was converted to a “Group for Coordinating Restoration and Reconstruction” and the provincial governments gradually took the responsibilities for the reconstruction (Dunford & Li, 2011, pp. 998-999).

From October 6 to November 7, 2008, the National Development and Reform Committee (NDRC) adopted ten specialty plans together with other ministries or administrations, including the Specialty Plan for Productivity Layout and Industrial Adjustment (SPPLIA) released on October 17. Following the division of three zones according to the suitability evaluations, the NDRC proposed nine industrial parks in Sichuan to be merged and relocated due to their inappropriate conditions, leaving 11 industrial parks to be recovered in situ and six development zones to be expanded, and four new industrial cluster area would be established (National Development and Reform Committee, Ministry of Industry and Information Technology, Ministry of Agriculture, Ministry of Culture, & National Tourism Administration, 2008, p. 9).

¹⁵ Eighteen counties (districts, cities) in Sichuan Province and part of Gansu and Shaanxi Provinces were included in the June 11 decision of counterpart assistance, but it was in the August 11 Overall Plan that the counterpart counties (districts) out of Sichuan Province were for the first time pointed out clearly: “Besides the publicized 18 counties (cities) in Sichuan Province, counterpart assistance is offered to Wen County, Wudu District, Kang County and Zhouqu County in Gansu Province as well as Ningqiang County and Lueyang County in Shaanxi Province” (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 116).

¹⁶ Other sayings about the date include the issue date of August 28, 2008 (Yong & Booth, 2011, p. 224), the release date in November, 2008 (X. Dong, 2012, p. 29), etc.

1.2.2 Challenges

Insufficient funding was the first and foremost challenge in the PWERR. The estimated demand for financial input in the initial SOP-PWERR was approximately 1,000 billion yuan (approx. 147.0 billion US dollars) (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, pp. 122-123). However, this estimation was far from accurate and was rather conservative indeed given the cost escalation of labor and building materials induced by the large demand during the major construction period (Chang et al., 2011; Chang, Wilkinson, Seville, & Potangaroa, 2012). By March 2009, the total funding demand amounted to 1,700 billion yuan (approx. 250 billion US dollars), according to the Vice Governor of Sichuan Province, Hong Wei (Wu & Ding, 2009).

As early as May 21, 2008, the State Council already established the Central Post Wenchuan Earthquake Restoration and Reconstruction Fund (CPERRF) and received a first funding of 70 billion yuan (approx. 10.3 billion US dollars) from the Ministry of Finance (X. Dong, 2012, p. 26; Dunford & Li, 2011, pp. 998-999). The total amount of government funding later achieved 360 billion yuan (approx. 52.9 billion US dollars), but there was still a big gap in the financing of the PWERR (Wu & Ding, 2009).

Another set of challenges came from the specific conditions at the time of the Wenchuan Earthquake which would also attract the attention of the Central Government: the global financial crisis had spread to China at about this time; and the 2008 Beijing Olympic Games were to start in three months, drawing the world's attention to China (T. Liu, 2010, p. 26 & 29). In addition, the disaster affected areas were at the risk of social instability, given the fact that there were already several petitions and drastic actions by those parents who lost their children at school and thus doubted the quality of school buildings (T. Liu, 2010, p. 30). These situations required the Central Government to react quickly to maintain the overall social stability while at the same time posed obstacles to their taking prompt actions. It was under such dilemmas that the Central Government proposed the national counterpart assistance program.

1.2.3 Counterpart Assistance Program

There has already been some research on the national counterpart assistance program (NCA) during the PWERR, and the conclusions are almost all positive towards this national policy by the State Council of the PRC. For instance, Xu (2013) identified the NCA as “more efficient and effective” than the three typical aid models in post-disaster recovery and reconstruction—Central government-oriented aid (CGA), national non-governmental organizations aid (NNA), and international humanitarian aid (IHA) (J. Xu & Lu, 2013, p. 75).

In fact, the NCA as a “systematic collaboration” and a “resource allocation mechanism” promoting the fast development of funds, skills, human and material resources at the national level (J. Xu & Lu, 2013, p. 86; P. Xu et al., 2014, p. 432), existed in China long before the Wenchuan Earthquake. It first emerged in the 1950s under the planned economic system, and was adopted in the development of border areas and minority areas in 1979 (Gao, 2010). This administrative procedure was also used to support key infrastructure projects (such as the Three Gorges Dam) as well as disaster response and reconstruction, as later specified in the Emergency Response Law in 2007, one year before the Wenchuan Earthquake (P. Xu et al., 2014, p. 432).

Although the conditions after the Wenchuan Earthquake fit into the requirements in the Emergency Response Law, it took the State Council quite some time and efforts to determine details in the NCA during the start-up process. The WEDRRA which came out first provided legal reference for the Central Government to start the NCA, but it did not specify which government units should take action in what approach following what principles to achieve what goals. All these details remained unknown until the State Council released a proposal a couple of days later, the scope of which was also revised several times before the final adoption (T. Liu, 2010, p. 33; State Council of the PRC, 2008a).

In addition to the aid-provision provinces (cities) and aid-reception counties (municipalities, districts), 18 Sichuan Provincial Departments were also involved in the NCA system to provide

efficient coordination among the multiple participants¹⁷ (J. Xu & Lu, 2013, p. 78). Furthermore, Sichuan Province also established the “Provincial counterpart assistance office” (CAO) to coordinate detailed NCA projects. Each aid-reception county in Sichuan Province had its own CAO, and “each aid-provision province dispatched a Front Line Headquarters (FLH) to work with the aided county’s CAO” (J. Xu & Lu, 2013, p. 80).

The main focus of the NCA during the PWERR was “project assistance” by the aid-provision units (J. Xu & Lu, 2013, p. 79). There were three modes of assistance in reconstruction: (1) the aid-provision units completed the construction and transferred the projects to the aid-reception units; (2) the aid-provision units and aid-reception units co-built the projects, each providing part of the resources needed; (3) the projects were self-built by the aid-reception units with financial and technical support from the aid-provision units. Selection among the three modes was determined by the aid-provision units and aid-reception units on a project by project basis.

¹⁷ Coordination Issue among the affected counties in Gansu and Shaanxi Provinces was rarely mentioned in articles, partially because these two provinces attracted less attention than Sichuan Province and there were fewer aid-provision units and fewer aid-reception units. In other parts of this thesis, when only 18 affected counties or 18 aid-provision provinces are mentioned, the term refers to the aid-reception units in Sichuan Province or the corresponding provinces if not otherwise specified.

Table 1 Overview of Paired Government Units in the National Counterpart Assistance Program

No.	Assistance provinces (cities)			Minimum funding required by the State Council		Counterpart counties (cities, districts)			Sichuan provincial departments for coordination	
	Name	Level	Total revenue, 2007		(billion yuan)	(billion US dollars, approx.)	Name	Level		CDI
			(billion yuan)	(billion US dollars, approx.)						
1	Jiangsu	Province	223.77	32.91	6.713	0.987	Mianzhu	City	0.6612	Economic and trade commission
2	Guangdong	Province	212.77	31.29	6.383	0.939	Wenchuan	County	0.8675	Transportation department
3	Shanghai	City	207.45	30.51	6.223	0.915	Dujiangyan	City	0.491	Education department
4	Shandong	Province	167.54	24.64	5.026	0.739	Beichuan	County	0.705	Development and reform commission
5	Zhejiang	Province	164.95	24.26	4.948	0.728	Qingchuan	County	0.5146	Construction department
6	Beijing	City	149.26	21.95	4.478	0.659	Shifang	City	0.5953	State-owned assets management committee
7	Liaoning	Province	108.27	15.92	3.248	0.478	An	County	0.4993	Finance department
8	Henan	Province	86.21	12.68	2.586	0.38	Jiangyou	City	0.3768	Land and resources department
9	Hebei	Province	78.91	11.6	2.367	0.348	Pingwu	County	0.4424	Civil affairs department
10	Fujian	Province	69.95	10.29	2.098	0.309	Pengzhou	City	0.4333	Labor and social security department
11	Hunan	Province	60.66	8.92	1.82	0.268	Li	County	0.3871	Agriculture department
12	Shanxi	Province	59.79	8.79	1.794	0.264	Mao	County	0.5107	Water resources department
13	Hubei	Province	59.04	8.68	1.771	0.26	Hanyuan	County	--	Health department
14	Anhui	Province	54.37	8	1.631	0.24	Songpan	County	0.1894	Commerce department
15	Chongqing	City	44.27	6.51	1.328	0.195	Chongzhou	City	0.2195	Environmental protection department

16	Heilongjiang	Province	44.05	6.48	1.321	0.194	Jiange	County	0.2171	Radio and television bureau
17	Jiangxi	Province	38.99	5.73	1.17	0.172	Xiaojin	County	0.2343	Culture department
18	Jilin	Province	32.07	4.72	0.962	0.141	Heishui	County	0.2201	Forestry department
19	Shenzhen	City	65.81	9.68	1.974	0.29	Gansu	Province	--	--
20	Tianjin	City	54.04	7.95	1.621	0.238	Shaanxi	Province	--	--

Sources: (*Guangdong Statistical Yearbook*, 2008; State Disaster Relief Committee & Ministry of Science and Technology, 2008, pp. 100-101; 2008; J. Xu & Lu, 2013, p. 79).

Notes:

- (1) Minimum funding required by the State Council is calculated by one percent of total revenue in 2007, multiplied by three years.
- (2) CDI means the comprehensive damage index, which was from the damage assessment results based on calculation from death numbers, economic losses, number of hazards, etc. (State Disaster Relief Committee & Ministry of Science and Technology, 2008, pp. 100-101). The index ranges between 0 and 1, and a higher index indicates more severe overall damage during the Wenchuan Earthquake. Hanyuan City was not found from the released results. Part of Gansu and Shaanxi Provinces assisted by Shenzhen and Tianji belong to different counties, and thus the CDIs were left blank here.
- (3) Shenzhen is excluded from the statistics of Guangdong Province.
- (4) The number before each pair provides a quick reference in Figure 1.

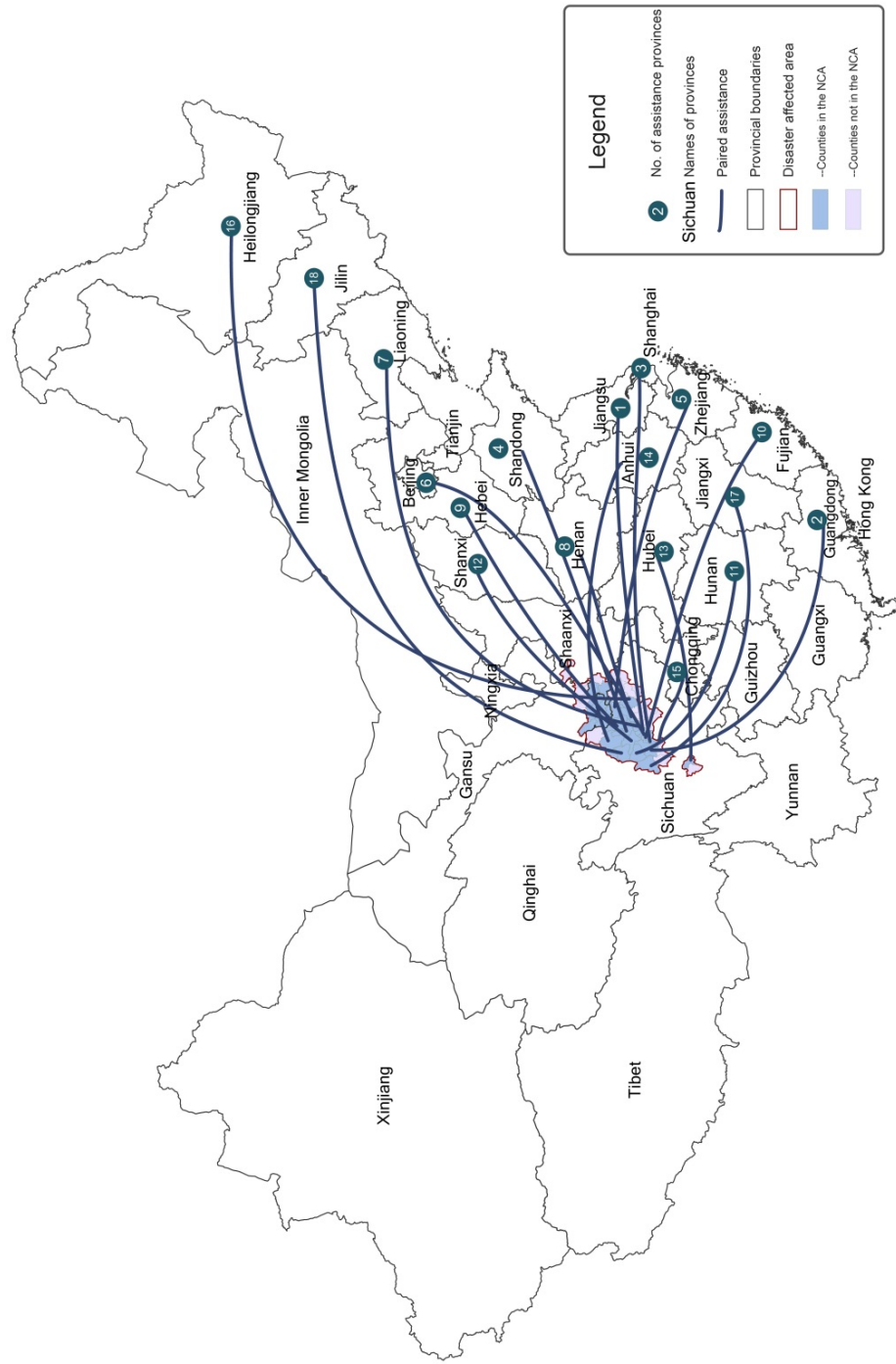


Figure 1 Assistance Provinces and Their Counterpart Counties in Sichuan Province

Note:

- (1) The figure is to illustrate the paired government units and help explain the NCA in general. The scope of the figure has been decided to best serve this purpose, but does not represent any political opinion of the author. The figure is not a map of China, and it is not converted to certain projections and scales, due to the lack of digitized data. Nor does it display the exact geographical locations or boundaries. This principle applies to other figures in this thesis, too.
- (2) The number (in circles) located in each assistance province is the same as in Table 1.
- (3) To simplify, paired assistance from Shenzhen and Tianjin is not displayed in this figure.

1.2.4 Recovery Progress

1.2.4.1 Overall

Despite all the challenges discussed previously, the general recovery and reconstruction in the disaster affected area happened quickly. The reconstruction of rural residences in the disaster affected area was completed in mid-February, 2010, around the traditional Chinese Spring Festival, and reconstruction of urban residences was almost finished by the end of May, 2010 (Jiang, p. 23). By the end of August in 2010, 3,183 counterpart assistance projects had been completed among all the 3,645 projects identified by the 18 aid-provision provinces, with a total investment from the NCA amounting to 67.8 billion yuan (approx. 10.0 billion US dollars) (Niu & Liu, 2010, p. 35). By the end of September 2010, almost all the aid-provision provinces had completed the mission of “completing the major part of the three-year NCA task within two years” proposed by the Central Government¹⁸ (H. Li, Chen, & Hou, 2011, p. 59; "Shuli Guoji He Guonei Liang Ge Dianfan: Guangdong Xieshou Wenchuan Jinru Hou Yuanjian Shidai," 2010, p. 14). By the end of 2010, 3,002 schools, 1,362 health care institutions and basic public service facilities had been completed (Y. Liu, 2010), and thus the NCA as well as the physical reconstruction process went towards its end.

Beyond the physical reconstruction, economic and social recovery was also worth looking at. Take the recovery of tourism in Sichuan Province as an example. The estimated economic losses from tourism by May 2010 were 706.8 million yuan (approx. 103.9 million US dollars) from foreign exchanges and 27.2 billion yuan (approx. 4 billion US dollars) from domestic tourists' expenditures (J. Guo & Xiong, 2011). The total income from tourism in Sichuan Province in 2008 was 109.2 billion yuan (approx. 16.1 billion US dollars) and 10.3 percent less from the previous year (Jiang, p. 23). However, this number soon exceeded pre-quake and increased to 147.2 billion yuan (approx. 21.6 billion US dollars) in 2009 (Jiang, p. 23). In 2010, the tourism income in Sichuan Province carried on the trend and increased by another 28.1 percent to 188.6 billion yuan (approx. 27.7 billion US dollars), among which 31.3 billion yuan (approx. 4.6 billion US dollars) came out of rural areas (Jiang, p. 23). Meanwhile, direct employment in tourism amounted to

¹⁸ This mission first appeared in the 2009 Annual Government Report of the State Council of the PRC on March 16, 2009. Retrieved from http://www.gov.cn/test/2009-03/16/content_1260221_3.htm

458,000, and employment in relevant industries was more than 2 million. Over 2,500 villages and 4 million farmers benefited from the encouragement on the development of tourism in rural areas (Jiang, p. 23).

1.2.4.2 Wenchuan County as an Example

Wenchuan County, as the epicenter of the quake, suffered from a direct economic loss of 64.3 billion yuan (approx. 9.5 billion US dollars) and was paired with one of the most wealthy provinces, Guangdong Province¹⁹, in the NCA (Jiang, p. 22). The counterpart assistance task was assigned to municipalities in Guangdong at the end of July (H. Zhang, 2008). Each municipality was paired with one town in Wenchuan County by the People's Government of Guangdong Province, and the counterpart assistance working groups entered Wenchuan in August, 2008. For detailed information about the counterpart assistance arrangement, refer to Table 2.

One year later (by July 31, 2009), 77 percent (541) of the 702 reconstruction projects²⁰ identified by Guangdong Province had been started (Yin & Fu, 2009). By April 30, 2010, 78.2 percent of the reconstruction projects in Wenchuan County were completed, and reconstruction of 99.7 percent of rural residences as well as 84.2 percent of urban residences was completed (G. Z. Wang, Li, & Liu, 2013, p. 2733). By the end of 2010, all the affected people in Wenchuan had moved to new residences, and Guangdong had invested 21 billion yuan (approx. 3.1 billion US dollars, or 94.7 percent of overall planned capital input²¹) through the PWERR projects (Jiang, p. 22). Meanwhile, the GDP of Wenchuan County grew by 34.3 percent in 2010 and per capita net income of farmers increased by 19 percent (Jiang, p. 22). The development of tourism in Wenchuan County can be found in Table 3.

¹⁹ Except for the City of Shenzhen, which was assigned to assist three counties and one district in Gansu Province.

²⁰ The total number of PWERR projects in Wenchuan County assisted by Guangdong Province was initially 501, but later Guangdong Province determined to increase investment and identified another 201 reconstruction projects (H. Li et al., 2011, p. 59; Qiao, 2010, p. 32).

²¹ The annual financial revenue of Wenchuan County was only 120 million yuan (approx. 17.6 million US dollars) in 2007. However, the total budget for PWERR projects amounted to 22.1 billion yuan (approx. 3.25 billion US dollars)(H. Li et al., 2011, p. 59). 8.2 billion yuan (approx. 1.2 billion US dollars) were expected to come from the People's Government of Guangdong Province (Qiao, 2010, p. 32), with the rest coming from the Central Government, municipalities in Guangdong Province, other government departments, non-government organizations, etc.

Table 2 Counterpart Assistance Arrangement by Guangdong Province

No.	Assistance cities	Budgeted revenue in 2007		Counterpart townships	Transfer time after completion
		(billion yuan)	(billion US dollars, approx.)		
1	Guangzhou	52.38	7.7	Weizhou (the Central Village only)	Mar 31, 2010
2	Foshan	19.45	2.86	Shuimo	Mar 31, 2010
3	Dongguan	18.65	2.74	Yingxiu	Sep 28, 2010
4	Zhongshan	8.61	1.27	Xuankou	Mar 30, 2010
5	Zhuhai	7.58	1.12	Miansi	Jul 18, 2010
6	Jiangmen	6.24	0.92	Yanmen	Dec 9, 2009
7	Huizhou	6.21	0.91	Sanjiang	Sep 12, 2009
8	Shantou	4.25	0.62	Caopo	May 12, 2010
9	Zhanjiang	3.82	0.56	Longxi	Jan 23, 2010
10	Zhaoqing	3.27	0.48	Keku	Apr 7, 2010
11	Maoming	3.17	0.47	Yinxing	Jul 30, 2010
12	Jieyang	1.73	0.25	Wolong	May 19, 2010
13	Chaozhou	1.35	0.2	Gengda	Oct 10, 2010
14	Shenzhen	65.81	9.68	Three counties and one district in Gansu Province	--
--	Guangdong Province	278.58	40.97	--	--

Sources: (X. Dong, 2012, p. 60; *Guangdong Statistical Yearbook*, 2008; H. Zhang, 2008).

Notes:

(1) The budgeted revenue was the only data available at the municipal level, but as seen from the sum of Guangdong Province, the number was the same as the total revenue from *China Statistical Yearbook* (The State Statistical Bureau of the People's Republic of China, 2008). The total revenue of the cities listed in the table does not add up to the total revenue in Guangdong Province, because the number of cities in Guangdong exceeds the number of townships in Wenchuan County and not all cities in Guangdong Province were paired in the counterpart assistance program.

(2) Completion of different assisted reconstruction projects varied in one township. Thereby I adopt the date of the ceremony for the official transfer of all projects from the assistance cities to the local governments (retrieved from the website of Sichuan Provincial Government: <http://www.sc.gov.cn/>) except for Shantou assisting Caopo, which uses the date from (X. Dong, 2012, p. 60). Individual project might be put in use earlier than this date, and additional projects might be constructed later.

(3) Transfer time for the localities assisted by Shenzhen has been excluded from the table mainly because Shenzhen was paired with a couple of counties and districts instead of one township and the reconstruction speed might differ from each other. In addition, Shenzhen's assistance to part of Gansu Province was under different local conditions and pressures from the 13 cities, which is out of my focus on Wenchuan County and its assistance province, Guangdong.

Table 3 Tourism Development in Wenchuan County (2005-2010)

Year	Total number of tourists received	Total income of tourism	
	(thousand visits)	(million yuan)	(million US dollars)
2005	547.8	181.00	26.62
2006	655.8	195.00	28.68
2007	819.2	233.65	34.36
2008	112.6	51.24	7.54
2009	858.4	203.02	29.86
2010	1,400.0	816.00	120.00

Adopted from (L. Zheng & Qiu, 2011, p. 108).

1.3 Wenchuan Earthquake in the Context of Post-Disaster Recovery Planning

Disaster recovery has been recognized as a “complex, multidimensional and nonlinear process” (Johnson & Hayashi, 2012) evolving from decision flows made by multiple participants over a long time (Olshansky, 2006, p. 148). This nature of recovery has defined the need for a comprehensive, multi-disciplinary research perspective (Johnson & Hayashi, 2012), which applies to the planning research realm as well. In order to direct future post-disaster recovery and mitigation, planning scholars have attempted to identify some fundamental elements from previous recovery cases (Berke, Kartez, & Wenger, 1993; Olshansky, Johnson, Horne, & Nee, 2008, p. 274). There are many theoretical lessons we can learn from international case studies, including policy making and implementation, initiation and development of collaboration, concerns about sustainability and resilience, and “individual characteristics and common practices” (Liou & Kapucu, 2014, pp. 451-454). In this sense, research on the PWERR in China adds to our understanding of post-disaster recovery (Blanco et al., 2009, p. 208), in that it shares the common tensions from time compression with similar disasters happening elsewhere in the world (Olshansky et al., 2008, p. 278), while at the same time, the government-led PWERR under the unique political and administrative system in China has produced an unusually rapid reconstruction process that, based on physical measures, appears to have been highly successful.

To draw lessons from the PWERR, the first question is how the recovery policies worked. Under the “distinctive characteristic of disaster recovery” (as compared to the normal planning and construction process)—time compression, or the tension between speed and deliberation (Blanco et al., 2009, p. 207; Johnson & Hayashi, 2012, p. 228; Olshansky, Hopkins, & Johnson, 2012, p. 173; Olshansky & Johnson, 2010, pp. 217-218), what accomplishments were achieved? When the “pressures to build back better” were translated into “build back faster” (Daly & Brassard, 2011, p. 530), what elements of betterment were overlooked and might add to future vulnerability? To reveal answers to these questions, an investigation into the positive and negative aspects of the overall recovery is needed. The second procedure is to understand the dynamics behind the planning and implementing process, including how the decisions were made and what factors influenced the decisions and actions of multiple stakeholders. Shaw (2014) argues that the speed of post-disaster recovery is “higher when it is done in a centralized way, by single agency” (Shaw, 2014, p. 5). The PWERR process, although initiated by a strong central government, also exhibited

some decentralized features due to the systematic organization and extensive inter-governmental collaborations of the NC. Thus we shall find out how the PWERR process worked at different scales, from the Central Government to localities. Based on these two steps, we will be able to draw lessons for policy makers and planners, and inform recovery theories by providing detailed observations of the “comprehensive scope of recovery” (Johnson & Hayashi, 2012, pp. 212, 217).

Shuimo, one of the severely hit towns in Wenchuan County, is a good case to use to understand the above questions, given that: (1) The physical reconstruction process in Shuimo was completed in only one-and-a-half years; (2) The town has gone through a rapid transformation from a household-based peasant economy and heavy energy-consuming industries to urban ecological agriculture and modern service industries; (3) Shuimo after the recovery was recognized by the UN as a Best Practice case and became well-known; (4) Our research team had access to more information about Shuimo than any other townships in the pool of alternatives. The next chapter will present the basic information about Shuimo and the research approach in the thesis. Chapter 3 is the whole story of Shuimo based on my research, starting from its development path in the past, to the damage and recovery process after the quake, and then to a list of outcomes after the PWERR. What decisions were made locally, who made them, and through what process are discussed in Chapter 4, followed by the identification of some key factors in the rapid planning implementation process in Chapter 5. In the final chapter, I will conclude with some takeaways for post-disaster recovery planning, point out some potential costs, and identify important questions that remain unanswered.

CHAPTER 2 RESEARCH METHODOLOGY

2.1 Study Area: the Town of Shuimo

The Town of Shuimo is located in Wenchuan County, Aba Tibetan and Qiang Autonomous Prefecture (hereafter referred to as Aba Prefecture). The total area of the township is 89.16 square kilometers (22031 US acres)²² (Foshan Assistance Group, 2010, p. 54). Shuimo is 36 kilometers away from the world heritage monuments in Dujiangyan City, and only 7.5 kilometers (4.69 miles)²³ southeast of the epicenter of the Wenchuan Earthquake (Chen & Yin, 2010, pp. 28-29; Foshan Assistance Group, 2010, p. 54; Xing & Xu, 2011, p. 152). The damage from the earthquake in Shuimo was less severe than in surrounding areas (Yingxiu, for example) and it had the largest area suitable for urban construction among all the 13 towns in Wenchuan County (Chen & Yin, 2010, pp. 10, 24; Foshan Assistance Group, 2010, p. 54).

The Town of Shuimo (hereafter referred to as Shuimo) used to be Shuimo Village, and it was not incorporated into a township until 1984 (Chen & Yin, 2010, p. 22). Baishi Village was incorporated into Shuimo in 1992 and became the second largest settlement in Shuimo (Z. Tang & Zhang, 2010, p. 1211). Shuimo is composed of 18 administrative villages, one community committee, and 73 Villager Groups²⁴ (H. Liu, 2011, p. 170; Z. Tang & Zhang, 2010, p. 1212). All but four among all 18 villages in Shuimo are scattered in mountainous areas, some of which are two hours' walk from the center of town (J. Zhang, 2012, p. 46).

²² The area has been converted by the equation of "1 square kilometer = 247.1 US acres". Conversion results will be provided only when the author thinks it necessary. There are two versions in regards of the total area of Shuimo: 89.16 square kilometers (Chen & Yin, 2010, p. 20; H. Liu, 2011, p. 170) versus 88.44 square kilometers (Chen & Yin, 2010, p. 7). I adopt the number from the official document (Aba Tibetan and Qiang Autonomous Prefecture Government, 2010).

²³ The distances vary from different sources, ranging from 7 to 12 kilometers (Chen & Yin, 2010, p. 25).

²⁴ An explanation of relevant terms can be found in Appendix A and Appendix B.

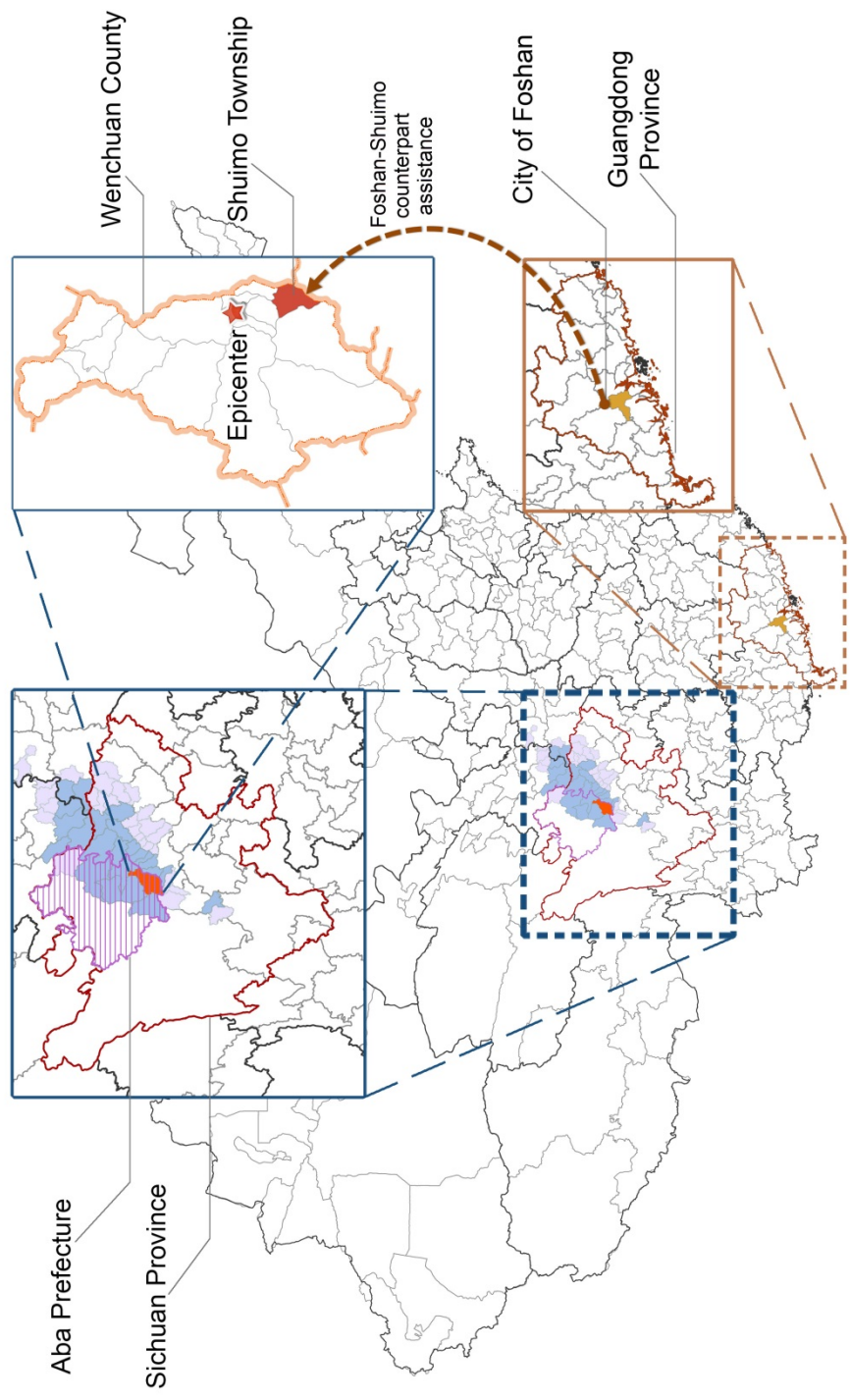


Figure 2 Location of Shuimo

Table 4 Basics of Shuimo, by Village

Village		Planned population change		Rural housing recovery (number of households)		Total Area		Farmland		Per capita farmland (US acres)
Name	No.	Before recovery	Planned population	Reconstructed in situ	Repaired	(hectare)	(US acres)	(mu)	(US acres)	
Majaying	1	782	11,500	216	24	283	699	219	36	0.05
Zhaiziping	2	447	4,200	106	17	86	212	161	27	0.06
Maopingzi	3	398	2,300	99	24	113	279	174	29	0.07
Guojiaba	4	960	1,300	185	65	406	1,003	657	108	0.11
Baiguoping	5	364	1,000	111	1	507	1,252	145	24	0.07
Baishi	6	625	1,000	154	42	829	2,047	124	20	0.03
Xianfengyan	7	698	800	189	8	289	714	365	60	0.09
Laoren	8	819	800	265	2	266	657	370	61	0.07
Liujiagou	9	552	700	111	45	620	1,531	611	101	0.18
Dacaotou	10	514	600	132	16	564	1,393	472	78	0.15
Gaofeng	11	520	600	155	9	1,337	3,301	602	99	0.19
Huangjiaping	12	345	500	73	13	745	1,840	65	11	0.03
Niutanggou	13	339	500	77	15	502	1,240	189	31	0.09
Dayandong	14	356	500	64	37	200	494	208	34	0.10
Lianshanpo	15	377	400	58	38	595	1,469	348	57	0.15
Heitupo	16	286	400	76	0	130	321	208	34	0.12
Dengcaoping	17	323	400	70	7	727	1,795	423	70	0.22
Chenjiashan	18	334	400	97	0	749	1,849	229	38	0.11
Central Village	--	--	26,000				--		--	--
Total		9,039				8,948	22,094	5,570	918	0.10

Source: (Shuimo Township Government & Foshan Academy of Urban Planning and Design, 2009).

Note:

- (1) The Central Village is a concentrated urbanized area where the Shuimo Township Government is located. It is not an administrative village in Shuimo, but is composed of parts of four villages—Laoren, Zhaiziping, Maopingzi, and Majiaying.
- (2) There were a couple of inconsistencies within the edition of plan I referred to. For instance, the planned population for Laoren Village was supposed to be over 2,300 based on the text, but from the table, it was 800. I found the numbers from the table more reasonable, which I decided to adopt.
- (3) The plan defined two phases in the post-disaster recovery and reconstruction: the first phase of recovery and reconstruction (2008-2011) and the second phase of development and enhancement (2012-2015). According to the text, the total population (capacity, as I understand it) was planned to be around 30,000 and 35,000, respectively; the population in the Central Village and Baishi would be around 24,000 and 28,000, respectively. However, it did not clarify by which time the population of each village was supposed to reach the planned population. The meaningfulness of the proposed population change, though not accurate enough, can still reveal the distribution patterns of emphasis among all the villages in Shuimo.
- (4) I copied the numbers of the pre-recovery population from one map of the recovery plan. Theoretically, the numbers should be post-quake population. There were no notes attached to the map explaining which population they were using, however. So there was the possibility that the planners used the pre-quake statistics. It does not help to look at the sum of the numbers because the various estimates of total population have displayed larger errors than the changes of population during the earthquake. Considering the total number of deaths in Shuimo to be around 90 (refer to Section 3.2 for details), I assume that there was not much difference between the pre-quake and post-quake population and listed the numbers as pre-recovery population.
- (5) The sum of the total area of the 18 villages slightly exceeds the total area of Shuimo. This might be because the numbers were changed to the closest integer measures by hectare.
- (6) For rural housing recovery, the repair work was completed by December 2008, and reconstruction in-situ was completed by November 2009.
- (7) Pre-recovery population and land data were not found for the Central Village.
- (8) The number of each village provides a quick reference on Figure 3.

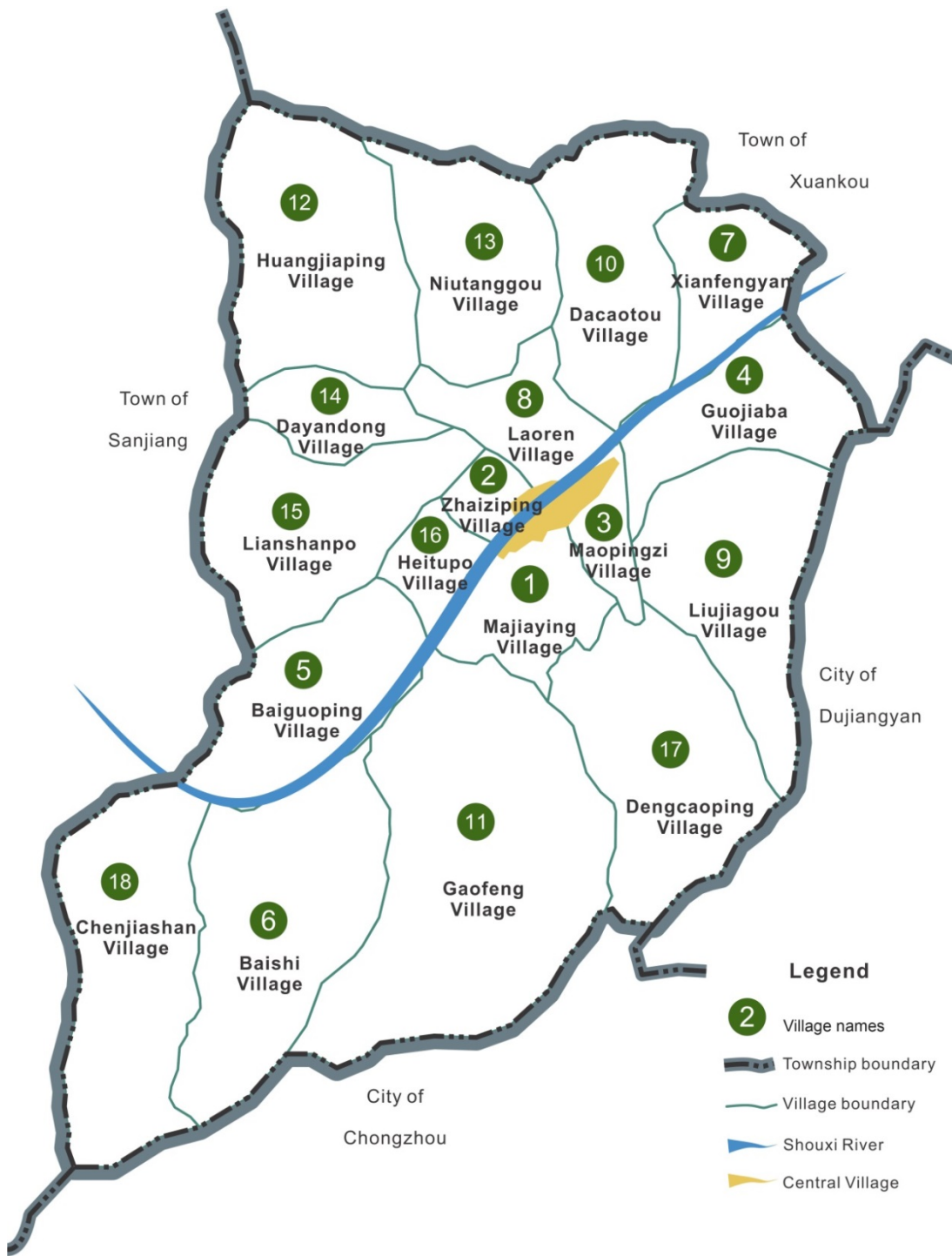


Figure 3 Villages of Shuimo

The total population of Shuimo in 2007 was estimated to be around 20,000²⁵. Although the majority of population in Shuimo belongs to the Han ethnic group, Shuimo is a multi-ethnic township, with 19.11 percent of its population Tibetan, 4.19 percent from the Qiang ethnic group and 0.7 percent from all other minority ethnic groups (H. Liu, 2011, p. 171; Z. Tang & Zhang, 2010, p. 1212).

Before 1998, Shuimo had been an agricultural township, relying on mainly farming, forestry, and aquaculture (Z. Tang & Zhang, 2010, p. 1212). The main crops of corn, wheat, beans, potato, and sweet potato cover 14,850 mu (2,446 US acres)²⁶ (Chen & Yin, 2010, p. 22); economic crops include rapeseed, and Szechuan lovage²⁷ (Z. Tang & Zhang, 2010, p. 1212). With a mild climate and adequate precipitation, 38,000 mu (6,260 US acres) of land was covered by forests and natural vegetables (Chen & Yin, 2010, p. 22; Z. Tang & Zhang, 2010, p. 1212). Forestry, animal husbandry, and fishery were the three natural resource-based industries as sources of income for the Shuimo people. There is also a small amount of metal minerals in the town, and the reserve of coal is considerable although it is not of high quality (Z. Tang & Zhang, 2010, p. 1212).

In 1998 the Sichuan Provincial Government approved a new high energy-consuming industrial zone in Shuimo and in June 2003, Aba Prefecture Government officially approved the establishment of an Aba Industrial Park in Shuimo (Z. Tang & Zhang, 2010, p. 1212). Located on the Shouxi River, the southern tributary of the Minjiang River, Shuimo owned abundant hydropower resources (Foshan Assistance Group, 2010, p. 54; P. Xu et al., 2014, p. 436). To

²⁵ It is difficult to find out an exact number, given the various data from diverse sources. The fifth national census in the Year of 2000 implied the total population of Shuimo was 10,467 on record (meaning the population with *hukou* in Shuimo). The pre-quake population on record was 11,935 (Xingzheng Quhua Wang, 2006~2007), 11,517 (or 4,025 households) (Y. Dong, 2011, p. 24), and 11,731 (Z. Tang & Zhang, 2010, p. 1212). Taking into consideration of a floating population (meaning population without *hukou* in Shuimo but live and work here) of about 8,000 (Z. Tang & Zhang, 2010, p. 1212), the total population before the quake might be around 20,000. Some other scholars and authors also use the mid-number of 15,000 as the population in Shuimo (H. Liu, 2011, p. 170; P. Xu et al., 2014, p. 436).

²⁶ Mu (or Chinese acre) is usually used in China to measure the area of farmland, cropland, etc., in agriculture. 1 US acre = 4046.873 square meter and 1 mu (Chinese Acre) = 666.7 square meters; Thus 1 US acre = 4046.873/666.7" mu = 6.07 mu.

²⁷ A fundamental herb in Chinese medicine, also known as Chuan Xiong in Chinese, or *Ligusticum wallichii* in Latin.

take advantage of the low-price electricity, a series of factories opened up in the small town, including paper plants, breweries, brick factories, lime kiln, mining, etc. By the time of the Wenchuan Earthquake, Shuimo had become an industrial base in Wenchuan County, gathering 63 factories in the small town (Z. Tang & Zhang, 2010, pp. 1211-1212; P. Xu et al., 2014, p. 436).

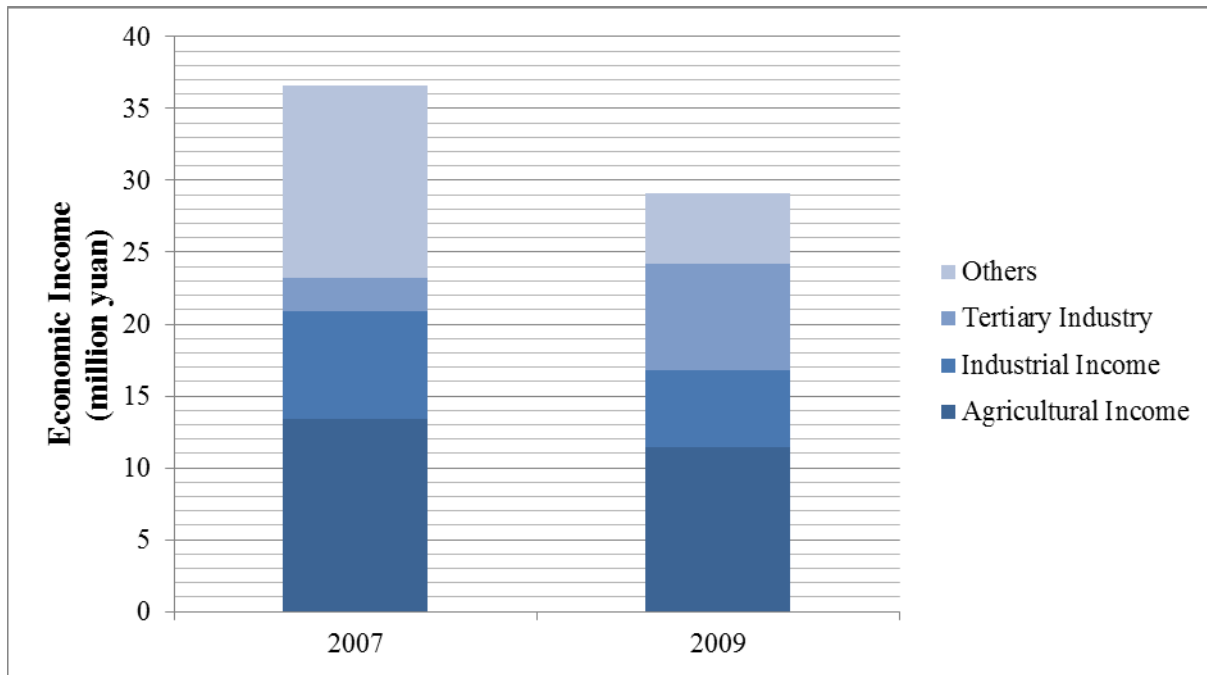


Figure 4 Total Economic Income in Shuimo, 2007 and 2009

Sources: (Chen & Yin, 2010, pp. 22, 29; Z. Tang & Zhang, 2010, p. 1212).

Note: “Others” in 2007 means income from working out of town as migrant workers.

However, the agricultural economy was still dominant in Shuimo (H. Liu, 2011, p. 16). In 2007, the total income of the rural economy in Shuimo amounted to 36.63 million yuan (approx. 5.4 million US dollars), of which 13.41 million yuan (approx. 1.97 million US dollars) came from agriculture, accounting for 36.6 percent; industry revenue 7.44 million yuan (approx. 1.1 million US dollars), accounting for 20.3 percent; tertiary industry 2.36 million yuan (approx. 0.35 million US dollars), accounting for 6.5 percent (Chen & Yin, 2010, p. 22). Total income of migrant workers was 13.42 million yuan (approx. 1.97 million US dollars), accounting for the remaining 36.6 percent (Chen & Yin, 2010, p. 22). Tertiary industry was mostly “street economy”, which aggregated in the town along the Xuankou-Sanjiang Highway (Chen & Yin,

2010, p. 22).

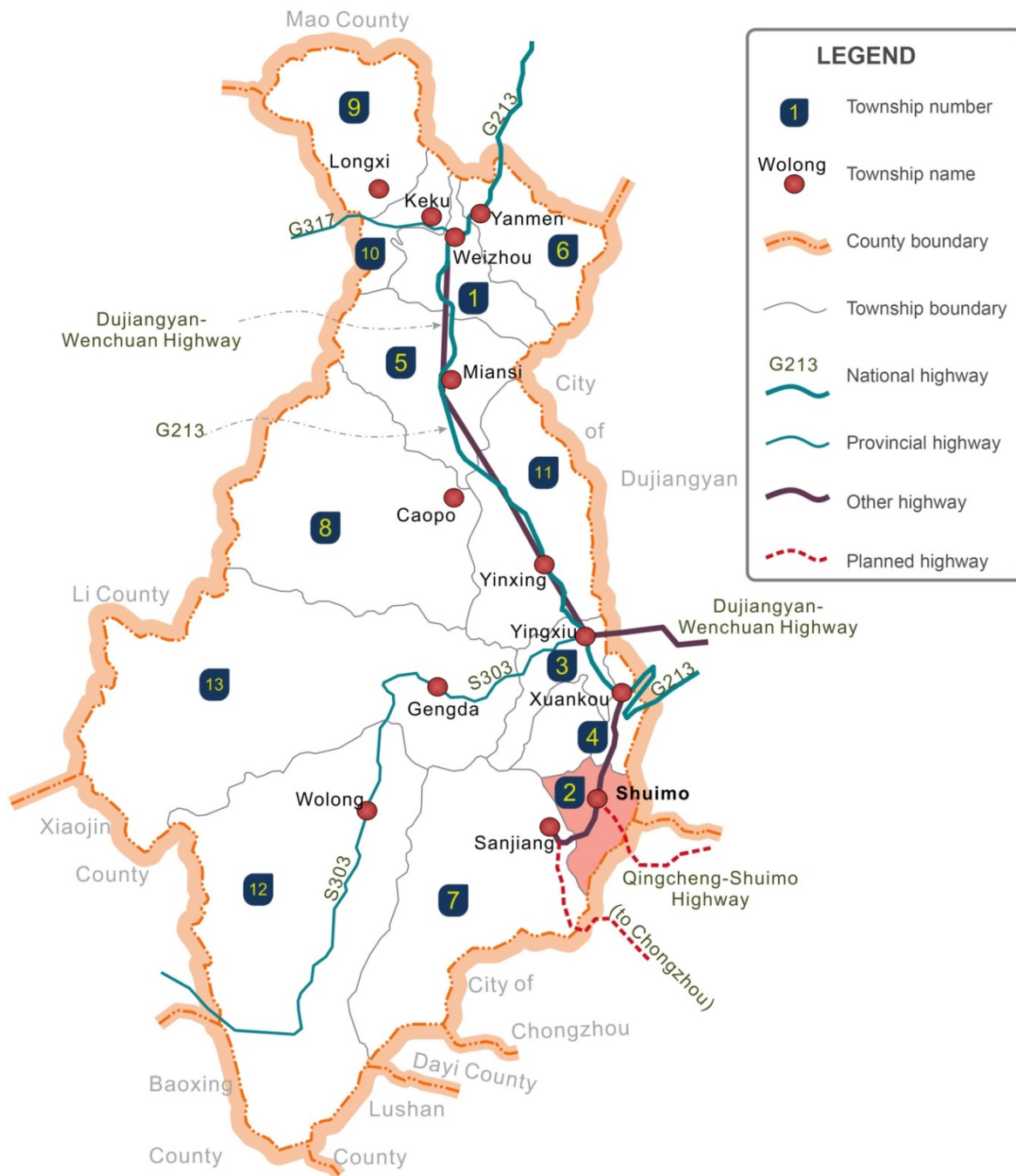


Figure 5 Townships in Wenchuan County and Major Transportation Connections around Shuimo

Note: The township number creates quick reference to the number in Table 2.

Wenchuan County, where Shuimo is located, is an important connection between Aba Prefecture and Chengdu, a gateway connecting Sichuan to the Northwest corridor, and it is also an important exchange center for various goods (Z. Tang & Zhang, 2010, p. 1212). The only highway crossing Shuimo was the Xuankou-Sanjiang Highway, which was connected to the National Highway G213 and Dujiangyan-Wenchuan Highway (Z. Tang & Zhang, 2010, p. 1212). However, because Shuimo was on the ending point of the Xuankou-Sanjiang Highway, the town was initially marginalized by the administrative attention and allocation of capital inputs in the first several national and regional policies of the PWERR. Transportation in Shuimo mainly depended on automobiles and tractors (Z. Tang & Zhang, 2010, p. 1212).

2.2 Research Questions

Shuimo was paired with the City of Foshan in Guangdong Province in the NCA, and with Foshan's assistance it was able to recover and prosper rapidly. Shuimo's reconstruction won several awards both domestically and internationally, including the "Best Global Implementation of Post-Disaster Reconstruction" award from the Sixth Global Forum on Human Settlements of the United Nations, making the small town well-known and no longer ignored on the policy maps (P. Xu et al., 2014, p. 436). There have been some articles on the case of Shuimo, and the dominant conclusions are that Shuimo is an overall successful model for post-disaster recovery (Pan, Hu, & Qin, 2012; P. Xu et al., 2014). Xu (2014) identified the SOP-PWERR adopted by the State Council as the key to its success, in that the Central Government's emphasized on sustainable development and the counterpart assistance program were implemented thoroughly through the top-down government system (P. Xu et al., 2014). I agree that the Shuimo case is "unique and not replicable in many ways" (P. Xu et al., 2014, p. 442), but I would argue that analytical research on the details in the PWERR process in Shuimo will provide valuable lessons, given that Shuimo represents the larger policies of the PWERR. This research seeks answers to the following research questions:

(1) Outcomes.

What were the changes to Shimo because of the earthquake? Because of the PWERR? In what ways have conditions improved in Shuimo, and what goals have not yet been reached?

(2) Post-disaster recovery and decision making processes.

How did localities, such as Shuimo, recover under the guidance of the policies made by the Central Government? What was the recovery planning process? How were the decisions made? By whom? In particular, how were reconstruction plans made and implemented? Who were the stakeholders, and what challenges did they face? How did the participants solve conflicts? How did they manage to meet the time constraints?

(3) Lessons to takeaway.

What were the factors affecting speed and quality in the post-disaster recovery process? How did the national counterpart assistance program work in Shuimo and how did this policy affect the

trajectory and speed of recovery in the town? What lessons can we learn from it? What could we learn about trying to achieve positive changes in post-disaster recovery?

2.3 Research Approach and Data Sources

Given its inherent explanatory feature, case study is the most appropriate method to address the many “how” questions in Section 2.2. Therefore, this research adopts case study analysis involving multiple perspectives and using all sources of data available, including first-hand information from field-based observations and interviews, as well as second-hand data from library and document search.

I, the author, conducted a field trip to Shuimo on January 1, 2014. The main purpose of the field trip was to gain basic knowledge of the current conditions, and make observations of visible recovery outcomes. The pictures²⁸ I took from the trip, together with the GPS tracks I recorded, have helped me to locate each spot and project on the map. Unfortunately, I was not able to ask the local people a lot of questions due to the barrier of local dialects.

I also used the results of a household survey (hereafter referred to as “HH Survey”), based on a 46-question questionnaire covering damage and property loss, evacuation and displacement, housing, and economic recovery. This survey was conducted by team members of a larger collaborative research project (funded by NSF Grant No. 1030332), of which I was a part. The team conducted the survey on July 4, 2011, and collected 49 effective samples from Shuimo²⁹. The survey did not sample randomly, thus could not represent statistical conclusions. However, the responses in the recovery section (especially the answers to the open questions) did indicate some concerns of the local people and provide clues on what might have happened in the place.

The majority of the second-hand data used in the research was collected by the author between September, 2013 and February, 2014, including: (1) Government documents from the post-disaster recovery and reconstruction policies, including plans by the Central Government, the local recovery plan, and the long-term comprehensive plan for the Town of Shuimo; (2) books introducing basic information about the Wenchuan Earthquake and the larger picture of

²⁸ All the photos in this thesis come from my field observation.

²⁹ One sample excluded from this number since the interviewee was actually not a resident of Shuimo. The 49 interviewees lived in 12 (out of 18 in total) villages of Shuimo. Ages of the interviewees ranged from 15 to 75, of which 5 were under the age of 18 and 3 were above the age of 70.

the PWERR process; (3) books describing the recovery process of Shuimo, counterpart assistance from Foshan, and the urban design concepts; and (4) research papers, journal articles, theses and dissertations on Shuimo and the general PWERR. In addition, the author was also able to access the collection of newspaper articles and online news from the collaborative research team, which document the sequence of events over time. Except for some electronic books and research paper written in English, most of the government documents, books, and news collections were written in Chinese. Therefore, the biggest challenge for writing this thesis was to make sure the translations of certain terms were correct and as simple as possible. A list of terms can be found in Appendix A.

Another challenge of the research came from the intrinsic bias and inaccuracies of the data sources. First, the amount of information we have for different stakeholders is imbalanced. For example, the Foshan Assistance Group and the Urban Design Coalition published several books, articles, and official reports; thus we know more about what these outsiders thought and how they acted than about the local government units and local residents. Second, the research articles and reports often referred to different numbers and sometimes contradictory information when introducing the local conditions and recovery processes, partially due to insufficient data available or different statistical scopes. The former source of bias is unavoidable to some extent, and the only way to mitigate is to establish a large document pool from diverse sources, which is what I did for this research. For discrepancies of information, I had to make my own judgment and take notes accordingly.

2.4 Research Scope and Framework

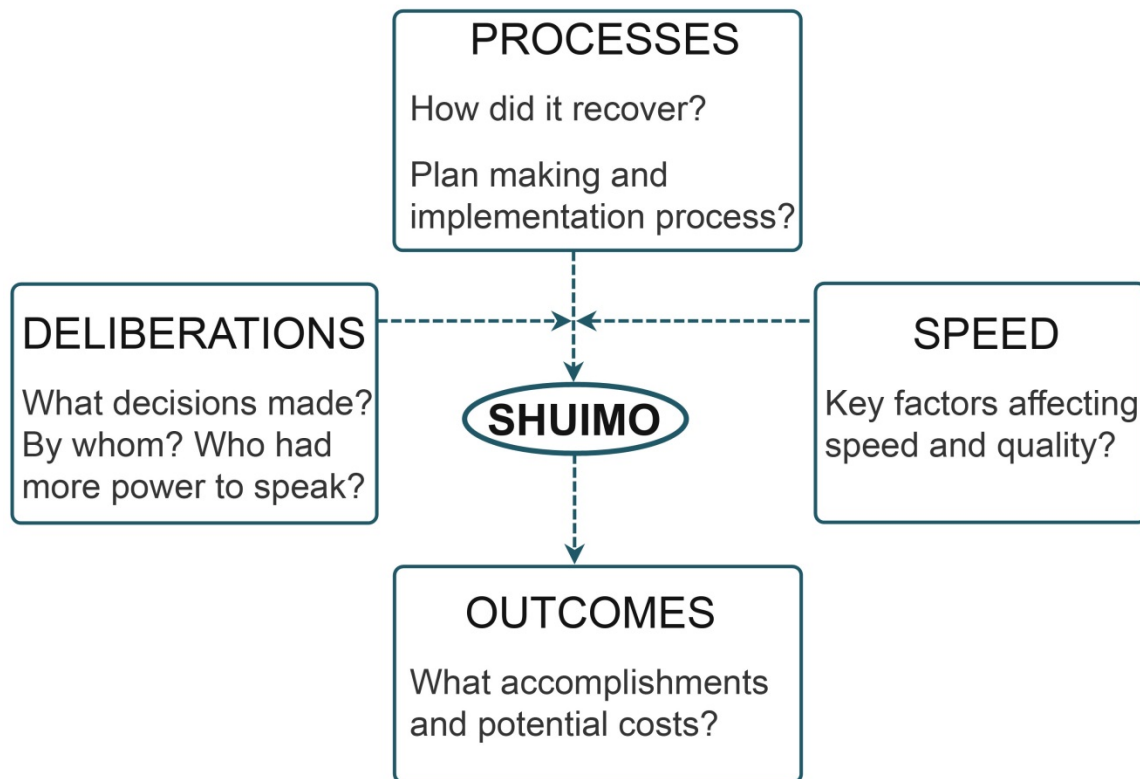


Figure 6 Research Framework

The following principles will apply in the determination of scope in this research:

- (1) Recovery involves both short-term and long-term restorations. In this research, only long-term recovery under the effort to bring communities to “normal functions” (Blanco et al., 2009, p. 200) is taken into consideration.
- (2) The focus of the research is on the Town of Shuimo, as implied in the title. This means, for example, that land use and economic changes in the broader region around Shuimo are not central parts of this research.
- (3) Policies and plans during the PWERR, either at the national level or at the local level, can have a variety of editions, each one slightly different from the other. The purpose of this research

is to find out what happened in reality, that is, the actual process and outcomes, rather than to compare different versions of unimplemented plans or policies, although some editions of the plans did provide essential information to understand the decision making process.

(4) I am aware that each individual participant and stakeholder might have held their own positions and made decisions and taken action correspondingly. However, to reasonably simplify the analysis of decision making process and the roles of participants, I treat officials from each government unit as one group of decision makers holding the same attitude and do not differentiate the differing ideas within each such unit, unless otherwise specified. For instance, for most of this research, I will take the Foshan Assistance Group as a whole decision making group and ignore the inside organizations of this group except for Section 5.2.4 or where specified.

CHAPTER 3 THE STORY OF SHUIMO

3.1 Pre-quake Development Trends

The town of Shuimo has a history dating back to the Shang Dynasty, as recorded by inscriptions, and it was called Laoren Village in the Han Dynasty, which indicates the longevity of residents at this place (H. Liu, 2011, p. 20). There are also ancient poems describing this village as Shangri-la (Foshan Assistance Group, 2010, p. 22).

The Chinese name Shuimo literally means a kind of farming tool, which uses water as power to process grain (Luo, 2011, p. 69). However, this may not be how the town was named. According to the “Wenchuan County Annals”, the origin of the name Shuimo came from Shuimo Creek, a tributary branch of Shou River in the county (Chen & Yin, 2010, p. 22; H. Liu, 2011, p. 20). Shuimo, located in the southern Shou River basin, is surrounded by mountains all around, with Shouxi River flowing from southwest to northeast, dividing the township into two parts.

In either of the two explanations, however, we can see how the natural resources became potential assets and provided possibilities for industrial development in this place. In fact, Shuimo attracted investment in high energy consuming industries as early as the period of the Republic of China (1912-1949). For instance, in the year of 1928, Nanxuan Gao established an iron plant in Guojiaba, a small village in Shuimo, according to the “Shuimo Town Annals” (H. Liu, 2011, p. 16). The private factory failed to survive in the following years due to lack of technical and financial support, though (H. Liu, 2011, p. 16). Thereafter, industrial development was delayed for decades, and agriculture (mainly farming and aquaculture) remained the main source of income for local residents and finance (Z. Tang & Zhang, 2010, p. 1212).

However, in the 1990s, conditions for energy-intensive industries became mature when China was both economically and technically prepared after the Open Door Policy. In 1998, Sichuan Provincial People's Government approved the establishment of a provincial High Energy Consumption Economic Development Demonstration Zone in Aba Prefecture, which encouraged the formal approval of the Aba Industrial Economic Park by Aba People's Government in June, 2003 (Z. Tang & Zhang, 2010, p. 1212). Shuimo was listed as one of the bases of the provincial

economic park, due to the advantage of relatively cheap electricity (Foshan Assistance Group, 2010, p. 23). By enjoying the preferential policies for foreign investment in Sichuan Province, it successfully introduced dozens of companies, including Pandaer Silicon Industry Co., Ltd., Yuefa Silicon Industry Company, Hongjiarui Rare Earth Co., Ltd., Minjiang Electronic Material Factory, Chengdu General Electronic, Zhenchong Power Co., Aba Cement Plant, Chuanxi Permanent Magnet Factory, Xilong Silicon Industry Co., Ltd., etc. (Chen & Yin, 2010, p. 22; H. Liu, 2011, p. 16; Z. Tang & Zhang, 2010, p. 1212). To serve the industries well, a couple of small hydro-power plants were constructed on Shouxi River (Chen & Yin, 2010, p. 11). By April 2004, there were 63 energy-intensive (and highly polluting) enterprises located in this small town (Z. Tang & Zhang, 2010, p. 1212).

As a consequence, 80 percent of all factories in Aba were located in Wenchuan (Zhuang, 2008, p. 80), while 70 percent of the industrial output in Wenchuan County came from Shuimo (Z. Tang & Zhang, 2010, p. 1211). This helps understand how Shuimo, together with Yingxiu and Xuankou, became the big three industrial townships in Aba (Zhuang, 2008, p. 80). These industries increased the revenue of Aba in general. However, the corporate taxes all went up to the Aba Autonomous Government, while local government received nothing from them (H. Liu, 2011, p. 16; Z. Tang & Zhang, 2010, p. 1212). The only benefit for Shuimo, according to Zhixiang Luo, the mayor of Shuimo, was to help solve the employment problem to some extent, and many residents working in a factory nearby earned a monthly salary of about 1,000 yuan (approx. 147 US dollars) (Z. Tang & Zhang, 2010, p. 1213). Nevertheless, the negative impacts of the high energy-consuming industries were enormous, with waste water and gas discharged into the river directly (H. Liu, 2011, p. 16). There used to be a paper mill along the riverside, around the drain of which there were dead fish all around (H. Liu, 2011, p. 16). Corn yield per hectare decreased from more than 1,000 kilograms to less than 500 kilograms, and sometimes they never produced after contamination (H. Liu, 2011, p. 17). Furthermore, construction and operation of these plants became a huge health risk for local residents and their offspring (H. Liu, 2011, p. 17). Based on the survey conducted by the medical doctors from Foshan, more than 300 children born after the industries came in suffered from congenital heart disease, and many of their parents who were healthy themselves worked in the plants (H. Liu, 2011, p. 18). Given the total population of only around 20,000 in Shuimo, the prevalence rate was abnormally high.

3.2 The Earthquake's Effects on Shuimo

During the Wenchuan Earthquake, 92 Shuimo residents lost their lives, 11 were missing, and more than 3,000 residents were injured to different degrees³⁰ (Chen & Yin, 2010, p. 29; Foshan Assistance Group & Peking University Institute of Urban Design; H. Liu, 2011, p. 170; P. Tang, 2011; Z. Tang & Zhang, 2010, p. 1212). Direct loss from water supply, electricity, roads, communication and other infrastructure was 5.8 billion yuan (approx. 0.85 billion US dollars) (P. Tang, 2011; Zhao, 2009, p. 40).

Based on an investigation on over 2,000 buildings in 11 villages in Shuimo, 75 percent of the residences were destroyed (H. Liu, 2011, p. 170), among which 55 percent collapsed, and 20 percent were severely damaged, leaving only 25 percent among all the residences reusable after repairs (Chen & Yin, 2010, p. 26; Z. Tang & Zhang, 2010, p. 1212). A total number of 14,949 rural houses collapsed, and 9,943 were damaged (Chen & Yin, 2010, p. 29; Foshan Assistance Group & Peking University Institute of Urban Design). Total areas of 769,110 square meters³¹ (approx. 8.3 million square feet) of rural houses, as well as 66,294 square meters (approx. 714 thousand square feet) of government-owned or enterprise-owned buildings were damaged. Ninety percent of the industrial facilities were damaged (Chen & Yin, 2010, p. 29; Foshan Assistance Group & Peking University Institute of Urban Design). All these resulted in a direct economic loss of 411.51 million yuan (approx. 60.5 million US dollars) in buildings (Chen & Yin, 2010, p. 19; Foshan Assistance Group & Peking University Institute of Urban Design).

Forty-five industrial enterprises were impaired, with a direct economic loss of 2.417 billion yuan (approx. 0.36 billion US dollars) (Z. Tang & Zhang, 2010, p. 1212). Only five buildings among all the 63 factories experienced relatively minor damages: Aba Cement, Xintong New Materials Co., Aba Carbon Products Co., Zhongcheng Smelting Co., Ltd., and Lidun Electronics Technology (Aba) Co., Ltd. Some projects under construction were never to be completed. For

³⁰ Numbers vary from different sources: 92 deaths according to (Foshan Assistance Group & Peking University Institute of Urban Design; H. Liu, 2011, p. 170); 90 deaths, 92 severely injured and 2980 with minor injuries from (Z. Tang & Zhang, 2010, p. 1212); 11 missing from (Chen & Yin, 2010, p. 29); 311 deaths and 3,701 injured from (P. Tang, 2011).

³¹ Total area means total building area here. Area was converted based on "1square foot = 0.09290304 square meter".

example, Sichuan Dayang Silicon Industry Co., Ltd., invested 115 million yuan in Shuimo, which was supposed to be the largest silicon smelting enterprise after its completion ("Zaiqu Youshi Hangye (Qiye) Chongjian Shiyi Tu,"). However, the earthquake destroyed everything.

Moreover, 81 percent of the industries in Aba relied on hydro-power energy ("Zaiqu Youshi Hangye (Qiye) Chongjian Shiyi Tu,"), which was severely damaged by the earthquake. Sichuan Electric Power Aba Branch, which supplied electricity for 70 percent of the industries in Aba, lost 47 employees ("Zaiqu Youshi Hangye (Qiye) Chongjian Shiyi Tu,"). The second largest electricity supplier, Min River Hydropower Company, experienced complete destruction of 110 KV substations in Yingxiu Town and Xuankou Town. The substation in Shuimo was damaged as well ("Zaiqu Youshi Hangye (Qiye) Chongjian Shiyi Tu,"), adding to the difficulty of industrial recovery. As a result, the SPPLIA listed the Aba Levigation Industrial Park in Shuimo as one of the nine industrial parks to be merged or relocated (National Development and Reform Committee et al., 2008, p. 9; State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 91; Z. Tang & Zhang, 2010, p. 1213).

Although the public facilities and infrastructure were wiped out and industries were devastated (H. Liu, 2011, p. 170), those plants that had survived the earthquake began their production again after three months, triggered by the high demand for cement, bricks, man-made silicon and other building materials (H. Liu, 2011, p. 16).

Table 5 Post-Wenchuan Earthquake Suitability Assessment Results for Construction in Shuimo, by Village

Village		Planned built area		Suitability assessment results (for construction)					
		(square kilometer)	(US acres)	Most suitable		Suitable		Not suitable	
Name	No.			(US acres)	(percentage)	(US acres)	(percentage)	(US acres)	(percentage)
Guojiaba	3	0.867	214.2	60.44	28.2	3.16	1.5	150.56	70.3
Maopingzi	2	0.423	104.5	45.07	43.1	--	--	59.45	56.9
Central Village	1	0.542	133.8	82.31	61.5	--	--	51.51	38.5
Majiaying	4	0.411	101.5	45.39	44.7	23.67	23.3	32.47	32.0
Zhaiziping	5	0.649	160.3	--	--	19.22	12.0	141.09	88.0
Baiguoping	6	0.702	173.6	--	--	74.57	43.0	98.99	57.0
Baishi	7	0.747	184.6	53.27	28.8	17.84	9.6	114.12	61.6
Total		4.380	1,082.30	286.49	26.5	138.47	12.8	648.19	59.9

Source: (Chen & Yin, 2010, p. 25).

Note: The number following each village name creates a reference to Figure 3.

3.3 Recovery Processes

The recovery and reconstruction in Shuimo involved both formal and informal processes. Formal process started from policies made by the Central Government, which were implemented by government bodies at lower levels, while informal processes, although sometimes involving government bodies, were mostly initiated or organized by other agencies or individuals. For example, in Shuimo the government bodies involved in the formal PWERR procedures include: the Central Government, Sichuan Provincial Government, Aba Autonomous Government, Wenchuan County and Shuimo Township Government, Guangdong Provincial Government, as well as Foshan Municipal Government. As for informal processes, I have identified three different modes in Shuimo. This part will introduce both types of processes in detail, focusing on the direct stakeholders and participants.

3.3.1 Formal Processes

The formal restoration processes in Shuimo were from August 2008 to March 2010, led by the pair assisting City of Foshan. On August 15, 2008, Ruilun Xian, the Deputy Mayor of Foshan and its Municipal Committee member, defined the basic tasks and clarified the procedures of financial processing (Q. Zeng, 2008). The counterpart assistance tasks included: to provide plan making, architectural design, consulting, engineering, construction and supervising services; to assist in construction or the repair work of water supply, drainage system, sewage treatment, and waste disposal; to provide mechanical equipment and construction materials; and to encourage enterprises in Foshan to invest and participate in the infrastructure restoration in the affected areas (Q. Zeng, 2008).

The Foshan-Shuimo Counterpart Reconstruction Working Group (hereinafter referred to as "Foshan Assistance Group" or "the Group") was established by the Foshan Municipal Government and took charge of the preparation of reconstruction planning projects and recommendations to put forward in each time period (Foshan Municipal People's Government, 2009). The Foshan Municipal Government asked the Foshan Assistance Group to give highest priority to the restoration of public facilities, including schools, hospitals, radio and television stations, welfare centers, etc.(Q. Zeng, 2008). The Foshan Fiscal Bureau also established the

Timeline	Recovery planning of Shuimo		National policies
Jun 2008			WEDRRA PCAP-PWERR
Aug 2008	Initiation	by Foshan Assistance Group	SOP-PWERR (draft)
Sep 2008			SOP-PWERR (finalized)
Oct 2008	Initial plan	made by the Foshan City Planning Bureau and approved by local government	SPPLIA
Dec 2008	Re-plan	through nationwide bidding	
	Implementation	Construction and design happened simultaneously	
May 2009		Phase I completed for projects with priorities	
Mar 2010	Completion	Phase II completed and projects transferred to local government	

Figure 7 Timeline of the Formal Recovery Processes in Shuimo

Foshan Assisting Post-disaster Recovery Special Fund for the reconstruction projects assisted by the city, and the fund was managed by the city (Foshan Municipal People's Government, 2009).

3.3.1.1 Initiation of Counterpart Assistance

The Foshan Assistance Group arrived at Shuimo on August 9, 2008, and they were assigned three tents on the ruins of Shuimo Primary School as office and living space. The Group and local governments first gathered in the Town of Weizhou, where the Wenchuan County Government was located, and had an initial discussion about how to start the recovery process. The Foshan Assistance Group, led by Hongbao Liu, proposed that: (1) The Group will need more investigation, including learning about local policies from Aba and Wenchuan; (2) The Group will assist Shuimo with the planning process; (3) Funding shall be used to achieve the best recovery results available. After this first conference, Hongbao Liu was assigned as the (Interim)

Deputy Secretary of Shuimo, and Xia Zhou the (Interim) Deputy Mayor (H. Liu, 2011, p. 2).

The Foshan Assistance Group and some experts from the Foshan City Planning Bureau spent the first month doing field work to complete the topographic mapping and geological hazard assessment (H. Liu, 2011, p. 9). By September 2008, Foshan Assistance Group members had agreed on the planning theme of Qiang ethnic style and ecological town (H. Liu, 2011, p. 29). After a second round of joint investigation with the urban design group in the second month, the Foshan Assistance Group proposed four objectives for the recovery of Shuimo: the most beautiful town in Wenchuan County; a modern Qiang style urbanized place; a model of eco-city in Sichuan Province; and a post-disaster recovery paradigm for sustainable development (H. Liu, 2011, pp. 32, 34).

The main task of the Foshan Assistance Group during the initiation period was to research on the local conditions and to relieve the affected people. Hongbao Liu and his group members were believers in rational planning, and they could not start their planning process without updated data. Thus they started from the collection of basic information—including topography, geology, natural resources, physical environment, population, and so on (H. Liu, 2011, p. 9). The group achieved no physical results during this period, but they identified the major challenges they would need to overcome: (1) Shuimo was unimaginably inaccessible, located on the end of Xuankou-Sanjiang Highway, and the National Highway G213 bypassed the town (H. Liu, 2011, p. 170). Furthermore, its natural environment did not display any geographic advantage to attract governmental and public attention, and it was further marginalized during the earthquake, hardly found in the maps, state plan, or on the Internet (H. Liu, 2011, p. 9). (2) Shuimo was severely polluted, and the air quality was much worse than Foshan, a city well known for its ceramic industry in Southeast China. (3) The post-disaster reconstruction was of extraordinary complexity, difficulty, and urgency, which came from multiple stakeholders: residents wanted houses and roads to maintain their basic needs; school teachers and students restarting their courses elsewhere looked forward to moving back to new campuses in Shuimo; local government officials wanted their office buildings; and governments at different levels each had their agendas and priorities. How to identify the overlapping interests of these stakeholders, under the time constraint, was the reality in front of the Foshan Assistance Group and would determine the future of Shuimo.

3.3.1.2 Planning and Re-planning Processes

Soon, the Foshan City Planning Bureau made an initial reconstruction plan for Shuimo, and revised it based on the comments from Hongbao Liu (H. Liu, 2011, p. 34). On October 8, 2008, the Plan was presented to the Foshan Municipal People's Congress Committee and Chinese People's Political Consultative Conference (CPPCC). On October 17, the plan was presented to experts in Foshan and the political officials in Wenchuan County at the same time, in Foshan and Chengdu separately. Later in November, the plan received approval by Wenchuan County and Aba Prefecture in the Wenchuan Restoration Projects Assessment Conference (H. Liu, 2011, p. 34). By this time, Foshan Academy of Urban Planning and Design had completed the General Plan for Shuimo to direct long-term development (H. Liu, 2011, p. 34).

However, the working approach of “making plans ahead”³² by the Foshan Assistance Group was not fully understood and supported by the local governments and villagers. On the Shuimo Recovery Meeting on October 9, 2008, Wenchuan County Secretary Bin Wang expressed his comments that the Foshan Assistance Group could use whatever approach they wanted in the reconstruction, but they must start the actual construction right away (H. Liu, 2011, p. 33). Maohui Chen, the Guangdong Provincial Assistance Group Leader, also emphasized that those urgent tasks (i.e., farmhouses, schools, hospitals, radio station, water conservancy projects, infrastructure, etc.) must be started immediately, and the Foshan Assistance Group should make a clear schedule and assign responsibilities to individuals (H. Liu, 2011, p. 33).

Such conflicts between speed and deliberation in the recovery planning process not only existed between the Foshan Assistance Group as outsiders and the local people as insiders, but also came into existence between different levels of the aid-provision government units. Later after the Foshan Assistance Group compiled their basic concerns and proposals of recovery plans into a book named “Eco-town in Wenchuan, West Qiang Cultural Township: Post-disaster recovery and reconstruction implementation plan for Shuimo, Wenchuan County”, some government officials at higher positions even kindly reminded the Foshan Assistance Group that their obligation in Sichuan was to “work” or “rebuild”, but not to write books or conduct any research (H. Liu, 2011,

³² Originally, “making plans ahead” was a general saying encouraging plan making before urban development. Here the Foshan Assistance Group followed this principle and wanted to be well prepared before the actual reconstruction, but was treated as the source of slow reconstruction.

p. 33). Despite these conflicts within government bodies and the peer pressures from the rapid reconstruction by other assistance cities in the towns nearby, the Foshan Assistance Group somehow managed to keep their own pace and take considerations carefully before taking any action. The fact is that, the non-action period of the Foshan Assistance Group lasted seven months in total, and the group did not even move a shovel of soil from August 2008 to March 2009, when the overall reconstruction of Sanjiang next to Shuimo was almost completed by Huizhou, Guangdong Province (H. Liu, 2011, pp. 31-33).

After the initial reconstruction plan was submitted to the Wenchuan County and Aba Prefecture for approval³³, the Foshan Assistance Group found the plan not thoroughly satisfactory: the plan was not outstanding among all the plans of its kind; and it was unknown whether or not the plan was appropriate for Shuimo, a mountainous town, although it would work well for plain areas (H. Liu, 2011, p. 34). Therefore, the Foshan Assistance Group decided to take more time for further deliberation.

Hongbao Liu got connected through his personal network to Keshi Chen, Director of the Peking University Institute of Urban Design and well-known for his expertise in the design of mountainous townships and tourism towns, at the beginning of November, 2008 (Chen & Yin, 2010, p. 8; H. Liu, 2011, pp. 36-37). Keshi Chen agreed with the Foshan Assistance Group on the future goal of Shuimo. In fact, Keshi Chen proposed to develop Shuimo into a tourism town as early as 2007, when the People's Government of Chengdu engaged designers at Peking University to participate in the tourism development plan for the Longmen Mountainous Region (H. Liu, 2011, p. 36). After several discussions, these experts agreed on the proposal of "one-designer-for-all" strategy, which meant the physical planning and design should be led by one entity, either one agency or a collective, from the general plan to the detailed architectural design to ensure a comprehensive project, with a unified style and integrated landscape, as well as to control communication costs (H. Liu, 2011, p. 172).

³³ The plan should be submitted in October, 2008, inferred from the timeline revealed: The initial plan was made and revised in October; and Hongbao Liu contacted Keshi Chen in early November. The submission time should be between the two events, although I have not yet found the exact date.

The Foshan Assistance Group organized a nationwide bid³⁴ for the post-disaster recovery plan. and called for proposals for both the plan for Shuimo and the designs for individual buildings as one package(Chen & Yin, 2010, p. 9; Zhao, 2009, p. 40). Keshi Chen and his group were asked to enter the competition as well (H. Liu, 2011, p. 37). Several groups participated in the bidding process, including Guangdong Urban Academy of Urban Planning and Design, Foshan Academy of Urban Planning and Design, Southeast Technological Institute, as well as a few enterprises. Keshi Chen's group bid as a coalition: Peking University Institute of Urban Design was responsible for the planning and urban design; Hong Kong Zhongying Institute of Urban and Architecture Design took the individual building designs; the Fifth Department of Southwest China Academy of Architecture Design took advantage of their familiarity of building codes and engineering standards, and cooperated with the detailed construction plan (Chen & Yin, 2010, p. 9; H. Liu, 2011, pp. 37, 172; Zhao, 2009, p. 41).

On December 12, 2008, the Foshan Assistance Group invited a number of national architecture masters, government officials in Aba and Wenchuan County, and planning experts from the Sichuan Provincial Planning Institute and Tongji University to form the committee for the selection of the Shuimo Master Plan Scheme, while members from the Foshan Assistance Group were not given voting rights (H. Liu, 2011, p. 37). In all the three votes, the university consortium led by Keshi Chen won the first place and their Conceptual Urban Design for Shuimo was determined to be the plan for implementation (H. Liu, 2011, p. 37; Zhao, 2009, p. 42). According to Hongbao Liu's own statement, there were no complaints in the whole process, and this was true for those who had previously raised objections on the bidding and planning processes (H. Liu, 2011, p. 37).

The whole bidding process took one month in total, during which time the Foshan Assistance Group was taking the risk of delayed construction (H. Liu, 2011, p. 172). But there was still a long way to go to complete a first-step master plan. Keshi Chen's group worked overtime even during the new year and the Spring Festival (January 26, 2009), but the detailed individual designs and construction plans were not finalized until March, 2009, only two months before the first post-earthquake anniversary (H. Liu, 2011, p. 47).

³⁴ It was a bid, and it was also a design competition. Winner of the competition would automatically win the bid and become the only urban planning and design agency for the recovery of Shuimo.

3.3.1.3 Implementation

A finalized plan itself does not mean any achievement, but only the start of pains and gains. In order to catch up with the reconstruction progress of other assistance cities, the Foshan Assistance Group took two strategies: (1) a two-phase implementation plan starting with the highest priority projects; and (2) implementation and individual design process conducted at the same time. In fact, before the Spring Festival in 2009 (January 26), all the Counterpart Assistance Groups were noticed that all school reconstruction must be completed by September 1, 2009 (H. Liu, 2011, p. 78). On February 2, 2009, the members and technical construction staff of Foshan Assistance Group became aware of the deadlines set by Guangdong province: the main building of Shuimo Middle School³⁵ must be finished by May 12, 2009, and the construction of the entire school done by August 30. Although many people reminded Hongbao Liu that the two deadlines were missions impossible due to the large volume, tight time schedule, and poor transportation and construction conditions, Liu insisted that four projects must be given the highest priority and be completed by the first anniversary: Chanshou Old Street Project, Shuimo Middle School Project, Guojiaba Landscape Transformation Project³⁶, and assistance to the Tea Plant (H. Liu, 2011, pp. 58, 78). Other projects were to be considered later as a second phase, after the inspection by high-level government officers in May, 2009.

To speed up these high priority projects, the Foshan Assistance Group started construction as soon as the architects and engineers finished their designs and drawings so as to save time. In other words, detailed design and construction were taking place almost at the same time during the first three months in 2009. At the peak time, almost 2,000 staff and workers were involved in the site of the Shuimo Middle School Project, and the construction was completed in 160 days, about one-third of the expected time as planned by engineers (H. Liu, 2011, p. 174). The rapid implementation speed extended to the second phase as well. For instance, after 10 months of justification, design and actual work back and forth, the Shouxi River Core Landscape Project started storing water more than 70 days ahead of initial engineering schedule (H. Liu, 2011, pp. 118, 174).

³⁵ Also known as the Wenchuan No.2 Middle School.

³⁶ This is part of the Guojiaba Qiaoxinju Housing Project (see Section 3.4.2.3).

By March 31, 2010, all 78 projects initiated by the Foshan Assistance Group were accomplished and transferred to the local governments (Y. Zeng, Peng, & Long, 2010). In regards of how the actual reconstruction was organized, there are three modes in the pair assistance process³⁷: (1) Self reconstruction by localities; (2) Entire reconstruction by Foshan Assistance Group and construction companies they hired; (3) Combination of the two, meaning a collaborative reconstruction by Foshan and localities. For key projects, the Foshan Assistance Group took full responsibility for the entire reconstruction process, and many of the construction companies were from Guangdong Province³⁸. For instance, the construction unit for Shuimo Middle School was determined through public bidding in the Foshan Construction Engineering Trading Center , and Guangdong Province First Construction Engineering Co., Ltd. (hereinafter referred to as “Guangdong First Construction”), won the bid (H. Liu, 2011, p. 78). Other projects were either self-reconstructed or constructed by Foshan-local collaboration (Foshan Municipal People's Government, 2009).

³⁷ The same as the three modes mentioned in Section 1.2.3.

³⁸ A full list of projects and the construction companies for key projects can be found in Appendix C.

3.3.2 Informal Processes

Although most of the reconstruction was led or initiated by government bodies through a top-down process, several informal processes emerged in the post-earthquake recovery, which also happened in Shuimo. From my research, three representative cases of informal processes have been recognized and will be presented in this part: (1) local leadership; (2) insider-outsider collaboration; (3) social work services.

3.3.2.1 Local Leadership

Local leadership has been recognized as one of the key elements in successful community recovery (Olshansky et al., 2008, pp. 274, 281). The case of Xianfengyan Village is an example. Xianfengyan is located in the northeast mountainous area of Shuimo Town, and more than 70 villagers lost their lives or were injured during the Wenchuan Earthquake. During its recovery after the quake, the leadership of the Party Branch Secretary in the village, Xuelin Zhang, played an essential role in finding a water supply and extending sources of income.

During the quake, all the five previous ditches were wiped out and the whole village water supply was cut off. Xuelin Zhang led a group of local villagers and managed to find a water source a couple of miles down the mountain. However, the annual cost of pumping water would exceed 300,000 yuan (approx. 44, 117 US dollars), covering labor, electricity, and maintenance fees. Local villagers could not afford this cost, and thus they had to give it up. In August 2008, Xuelin Zhang went into the mountains again and found another source of water in a neighboring village two weeks later. He then organized a group of villagers into the construction of a local water project starting in September. In mid-December, 2008, they successfully laid an 8 kilometer (5 miles) water diversion pipe (Deng & Zhou, 2011, pp. 22-23).

In order to improve self-reliance and to return to normal life, Xuelin Zhang also tried every effort to expand sources of income for the local villagers. He introduced a new kind of red kiwi from Cangxi County and encouraged them to plant as many as 1,150 mu (approx. 189.5 US acres) of it. However, the kiwi plants needed three years to grow before producing kiwi fruits, so Xuelin Zhang got 40,000 kg of black konjac seeds, which could be harvested in the same year and thus became the major source of income for many villagers to survive the early post-quake period. In

addition, when the post-disaster reconstruction in Wenchuan County planned to develop the Xuankou-Sanjiang tourism ring, Xuelin Zhang sensed the commercial opportunities and therefore encouraged villagers to open up farmhouse tourism. By 2011, there were already 22 households involved in the tourism service, and even one villager who had been working elsewhere for years decided to come back to Xianfengyan and invest in a new three-star standard farmhouse to better serve the tourists (Deng & Zhou, 2011, p. 23).

3.3.2.2 Government-Villager Collaboration

Foyuan Road was a 1,500 meter (0.94 mile)³⁹ long, 3 meter wide road in Lianshanpo Village of Shuimo, named after the city of Foshan (Foshan Assistance Group, 2010, p. 89). The Chinese character “Fo” means Buddha, and “yuan” indicates the religious tradition and linkages between Foshan and Shuimo. During the construction process of Foyuan Road, Foshan Assistance Group provided funding and technology while the local villagers themselves volunteered in the actual management and construction, which became a new model in Wenchuan’s post-disaster reconstruction (Foshan Assistance Group, 2010, p. 89).

The story started when a journalist wrote a report on Linxiang Cheng’s family in the village who lost their only son in the earthquake, and the parents walked back home with the body of their son due to the narrow, incomplete and poor quality road. Among all the 18 natural villages, this mountainous road was the most dangerous one. Linxiang Cheng’s father had lost his life in a vehicle accident on the road. Hongbao Liu visited this village and asked this family what they wanted in the recovery, and a safer road to the outside world was their answer (H. Liu, 2011, p. 99).

Starting April 2009, the road construction project was post on the agenda of the Foshan Assistance Group (mainly for funding purposes), while more than 50 villagers in Lianshanpo First Villager Group held five meetings to discuss how they should participate in and proceed the project (H. Liu, 2011, p. 101). Many of them left their previous jobs and came back to their hometown from Chengdu, Dujiangyan, and elsewhere. However, prices of building materials were soaring and money was needed for too many other projects. Hongbao Liu draw 300,000 yuan

³⁹ 1,000 meter of length from (H. Liu, 2011, p. 96).

(approx. 44,100 US dollars) from the engineering rescue fund, which only covered the cost for gravel, cement, and rent for necessary equipment (H. Liu, 2011, p. 101).

Those villagers, mostly with limited education, began to solve these problems with their own wisdom of life. A road construction team emerged spontaneously, with teenage girls and the elderly in the 70s, all volunteering to participate. They wrote down the names of all 58 villagers in Liangshanpo First Villager Group, and marked their attendance every day. For every absence, a fine of 60 yuan would be issued (H. Liu, 2011, p. 101).

To minimize the costs, local villagers used their social networks: The blender was rented from a cousin of a villager who was repairing motorcycles in the Central Village of Shuimo, with a monthly rate of 900 yuan, one-fourth lower than the average market value; Another villager contacted a friend and bought more than 200 tons of cement, with a price 30 yuan cheaper than in the market, which helped save more than 6000 yuan in this single item. In addition, Linxiang Cheng led a group of young people to cut trees in the mountains more than 10 miles away, bring them back with motorcycles, and process them into 2-meter pieces to use for the road (H. Liu, 2011, p. 101).

At 9pm on April 30, 2009, when the road team finally completed all the preparatory work, and all materials and equipment were in place, they realized that the existing road was too narrow to transport the cement and mixer. All they could do was to put the materials and machinery on the hillside, and self-organize a vigil team to prevent them from being stolen (H. Liu, 2011, p. 102).

As for organization, four sub-groups were established—construction command group, measuring group, material procurement group, and financial oversight group—and each of these groups had three “leading members” determined by spontaneous voting. These leading members would gather at Linxiang Cheng’s place every evening after dinner, assign work for the next day, and coordinate emerging issues (H. Liu, 2011, p. 101).

On June 29, 2009, the opening ceremony of Foyuan Road was held. To describe the whole process, Foyuan Road was led by the Foshan Assistance Group, organized by local governments, and hosted by villagers themselves (H. Liu, 2011, p. 106). The government-villager, insider-outsider collaboration was not all about cooperation. In reality, villagers all had their own

considerations: some hoped that the project could purchase gravel from their home-owned factory; some would ask for compensation due to the destruction of existing crops in their field; and some claimed to donate their own stuff, but later changed their mind after criticism by their wives (H. Liu, 2011, p. 101). Nonetheless, the process created a positive result.

3.3.2.3 Social Work Services

Another example of informal processes is the social work activities. A few social work organizations served post-quake Shuimo (refer to Table 6). In this part, I will mainly focus on the Guangzhou Qichuang Social Work Service Center (hereinafter referred to as Guangzhou QiChuang) and introduce some of their challenges and efforts.

Guangzhou QiChuang initiated their service in Sichuan Province soon after the earthquake (R. Wang, 2012, p. 13). In general, Guangzhou Qichuang applied an integrated service model of linking school, family and communities. Their services varied over the different stages of post-disaster reconstruction⁴⁰.

The First Stage was from June to August in 2008. By this time, the government's reconstruction policy had been approved, and the Foshan Assistance Group, local governments, and all the villagers had started to engage in the physical reconstruction. Because social work was not included in the reconstruction plan, however, social workers could only provide remedial and developmental services along with the physical reconstruction process. For Guangzhou Qichuang, the focus at this time was to accompany the students and provide grief counseling and needs assessment to residents (He, 2011, pp. 20-21).

The second stage, from September 2008 to August 2009, was the transition period in the recovery process. During this time, the reconstruction plan was adopted, and counterpart assistance from Shuimo entered a new stage with public participation and fast physical reconstruction. The living spaces of residents were scattered and rapidly changing: residential buildings were either torn down to be rebuilt or under renovation, so some residents lived in

⁴⁰ The divisions of stages vary in different articles, thereby I have combined many of their opinions together (He, 2011; R. Wang, 2012; J. Zhang, 2012).

Table 6 Incomplete List of Social Work Organizations Working in Shuimo

Social work organizations	Post-Wenchuan Earthquake services				Funding	
	Starting time	Type	Localities	Number of Staff	(million yuan)	(million US dollars, approx.)
China Association of Social Work	May-2008	Professional social work services	Shuimo, Dujiangyan, Mianyang	10	12	1.76
Hong Kong Polytechnic University-Shuimo Social Work Station	Feb-2009	Life education, parent-child relations, assistance on homework during summer break, etc.	Shuimo	3 (two full-time and one part-time)	0.6	0.09
Guangzhou Qichuan Shuimo Primary School Social Work Station	Jun-2008	Social work at schools	Shuimo	5	2	0.29
Guangdong-Wenchuan Datong Social Work Service Center	Nov-2009	Psychological relief and training services for local people (especially the underrepresented groups, i.e., orphans, the elderly, etc.), government officials, assistance participants.	13 towns in Wenchuan County, including Shuimo	13	4	0.59

Source: (Bian, Lin, & Deng, 2011, pp. 72-73)

temporary shelters or rental housing during this period of time. Subsidies from the Central Government helped residents cope with the economic burden, but the lack of details in the regional policies provided no guidance for local decisions, creating conflicts and psychological feelings of being victims among local residents (R. Wang, 2012, p. 14). (HH Survey, Q20).

Following the instructions of “completing the major part of the three-year NCA task within two years” by the Central Government, reconstruction was supposed to be completed as early as possible. For schools, such as Shuimo Primary School, the timing constraint was even tighter. Moreover, students and teachers from Yingxiu Primary School were about to temporarily move to Shuimo Primary School and continue their normal study, adding to the need to hire a large number of construction workers. Therefore, the Shuimo Primary School had to be on break in early June, 2009, in order to save the limited board rooms for the migrant workers to live in. As a consequence, the condition in Shuimo was adults working on sites under great pressure while students were neglected at home, leading to potential alienated parent-child relationships (He, 2011, p. 21). Although social workers were unable to participate directly in the restoration due to the limitations of the political system, they chose to listen to the pressures of the local villagers and involve students in their communities (He, 2011, p. 21; R. Wang, 2012, p. 14).

From September 2009 to February 2011, the focus of social work in the third stage turned to community spiritual and cultural needs (He, 2011, p. 22; R. Wang, 2012, pp. 14-15). By this time, all the major projects were being completed, and Shuimo was transitioning from an agricultural town into a cultural, ecological township, with an emerging education- and tourism-based industrial system. The new environment in Shuimo was a shock for the local residents, and the rapid socio-economic transformation resulted in a huge impact of consumerism on the traditionally simple and stable social values. Local people were unfamiliar with the modern living environment and not accustomed to the lifestyle change from rural to urban towns. They lacked a sense of belonging to the new community, and some residents failed to maintain the tidiness and cleanness of the public environment, vandalism of properties, and got into disputes among each other (He, 2011, p. 22). In addition, a sharp increase in the floating population⁴¹

⁴¹ Floating population means those who worked in one place but did not own residence or have the official *hukou* in this place. The scope of this term may vary in different statements, but in most cases it refers to the phenomenon of

also brought a diverse and complex phenomenon, with both positive and negative aspects of growth (R. Wang, 2012, pp. 14-15). Therefore, there was urgent need for the improvement of cultural activities to meet the requirements of the changing environment. Social workers initiated community activities and helped establish three community organizations to support them (He, 2011, p. 22):

- (1) “Qun Fang” Association, a women’s self-assistance group, with 100 official members.
- (2) “Chuan Yue” Volunteers Association, a youth volunteer service organization started from the beginning of 2011. Wenchuan Qichuang started recruiting middle school students to participate in school and community service, and they trained 11 core members, encouraging them to independently carry out the “Sweeping Chancheng Bridge: An environmental Protection Action”.
- (3) “Cha You” Association, an elderly self-assistance group.

At the end of January, 2011, Guangzhou Qichuang ran out of funds, and obtaining new funds was extremely difficult. Despite the financial difficulties, a strong sense of mission led Guangzhou Qichuang to a decision to stay in Shuimo and register a new local brand (He, 2011, p. 23). Wenchuan County Qichuang Social Work Service Center (hereinafter referred to as the Wenchuan Qichuang) was established in January, 2011 (He, 2011, p. 20), and they started joint development with the new towns and villages after identifying three key issues in the affected towns:

(1) Economic Issues.

All the post-disaster subsidies and compensations resulted in increasing disparities among local residents, particularly between those in the Central Villages and those living in the mountainous areas. When contradictions accumulated, social work could assist to mitigate the negative effects (He, 2011, p. 23).

(2) Demographic Issues.

farmers losing lands and migrating to large, rapidly urbanizing cities in China. It has been often treated by the public as the key source of many social problems in Chinese cities, although in recent years some people realized that the floating population was more complicated than they had imagined.

As college students, high school students and a large number of stores moved into Shuimo, the total population in Shuimo would exceed 40,000 according to the plan, with different ethnicity, occupations, educational levels, and cultural backgrounds. Frictions or even conflicts among these different groups would be inevitable, thus it was necessary to promote mutual understanding between heterogeneous groups (He, 2011, p. 23).

(3) Family Education.

Shuimo used to be an industrial township before the earthquake, and residents in the town worked in the plants to make a living. After the recovery, industry gradually moved out of the town and was replaced by tourism (J. Zhang, 2012, p. 46). When many of them became store owners or landlords after the recovery, the rapid increases of income created new tensions within households. On the other hand, residents in the mountainous areas had to leave home to work elsewhere because of the industrial transformation in Shuimo, and many of their children were left behind at home and lacked necessary attention (He, 2011, p. 23). These parents could provide their children with food and clothing, but failed to fully support their intellectual and mental development. Some children, for example, might see their father only once a year (J. Zhang, 2012, p. 46). Therefore, service for youths in the communities and those left-behind children became an urgent issue.

One effort Wenchuan Qichuang made in Shuimo after the physical reconstruction was to help the local students through volunteer and exchange activities. The scattered distribution of the villages made it difficult for students to communicate with each other during weekends and holidays, which made their leisure time somewhat lonely and boring (J. Zhang, 2012, p. 46). The Aba Normal College moving to Shuimo brought in a group of volunteers who could help. Each week, volunteers from Aba Normal College would go to rural villages and engage in academic counseling and community activities (J. Zhang, 2012, p. 47). Wenchuan Qichuang also reached out to external resources and introduced college students from other places to Shuimo, hoping that they would bring in diverse cultures and knowledge. Besides the “introducing inside” approach, they also attempted to create a new platform for local students to explore outside Shuimo Township. In the summer of 2012, for instance, 10 students from mountainous villages in Shuimo, participated in a three-day exchange activity in Chengdu with 10 students from Beichuan,

under the leadership of social workers (J. Zhang, 2012, p. 47).

From the story of Guangzhou Qichuang (and later Wenchuan Qichuang), we have taken a glimpse at what the social work services did in Shuimo. From the perspective of recovery research, feedback from the local villagers regarding the services of the social work organizations would help us formulate an evaluation of their performance. For us planners, it would also be helpful to know more about the financial support and how Wenchuan Qichuang worked through obstacles under pressure. Unfortunately, I have not managed to find useful information on these aspects in this research, and thus the story of social work services presented here is only part of the truth. Nonetheless, we have seen some negative side effects of the fast recovery and reconstruction, despite thoughtful deliberation: temporary change of local demographics, neglected parent-children relations and family education, and forced changes in lifestyle induced by transition of physical environment. The top-down formal recovery processes mainly concentrated on the overall outcomes, in particular the recovery of residences, public facilities, industries, employment and income, but the long-term recovery would never end until individual needs for psychological recovery were fulfilled. The governments paid little attention to the cooperation with social service organizations throughout the post-disaster recovery, yet it was a good sign that after the Wenchuan Earthquake, governments and communities in China finally realized the necessity of social work (Sim, Ki, Quen, & Dong, 2013, p. 558; J. Xu & Lu, 2013, p. 89). It is still a long way to go before the collaboration or even integration of the two parallel processes, though.

3.4 Outcomes and Changes

The Ceremony of Transferring Reconstruction Projects Assisted by Foshan in Shuimo was held on March 31, 2010, representing the final stage of the counterpart assistance in the post-disaster reconstruction from Foshan to Shuimo (Z. Li, 2010). While a majority of interviewees said that they had completely recovered to the quality of life before the earthquake by July 2011 (HH Survey, Q38), more details are needed to examine what was achieved during the formal recovery processes and what were the changes compared to pre-quake conditions. In this section, I will address as many facts as possible and make comparisons in each of the following aspects.

3.4.1 Reputation

The first and foremost change for today's Shuimo is its national and global reputation. Before the earthquake and before the reconstruction process, Shuimo was just a small town unknown and ignored in most of the regional recovery plans (i.e., Ministry of Housing and Urban-Rural Development (MOHURD), The People's Government of Sichuan Province, The People's Government of Gansu Province, & The People's Government of Shaanxi Province, 2009). During and after the restoration, Shuimo won a series of planning and design awards and had even attracted cultural and tourism events.

The first awards falling in Shuimo were for its post-earthquake master plan and designs. On March 17, 2009, the Wenchuan County Government and the Guangdong Provincial Assistance Group co-organized the "Wenchuan County Post-Disaster Recovery Plan and Design Contest" among all the 13 townships in Wenchuan (Chen & Yin, 2010, p. 146; Foshan Assistance Group, 2010, p. 44; H. Liu, 2011, p. 49). After three days' review, the Foshan-assisted "Post-disaster Recovery and Reconstruction Planning and Design in Shuimo" won a total of six awards, including the first award in Post-Disaster Recovery Township Plan.

On April 11, 2010, Shuimo Township Of Wenchuan County was awarded the Global Human Settlements Award and was named World Best Practices of Post-Disaster Reconstruction by the Global Forum on Human Settlement and UN-Habitat World Best Practices Magazine (Asia-Pacific Edition), due to it being an innovative example for the rest of the world of prompt and sustainable post-disaster reconstruction (Foshan Assistance Group, 2010). Two weeks later,

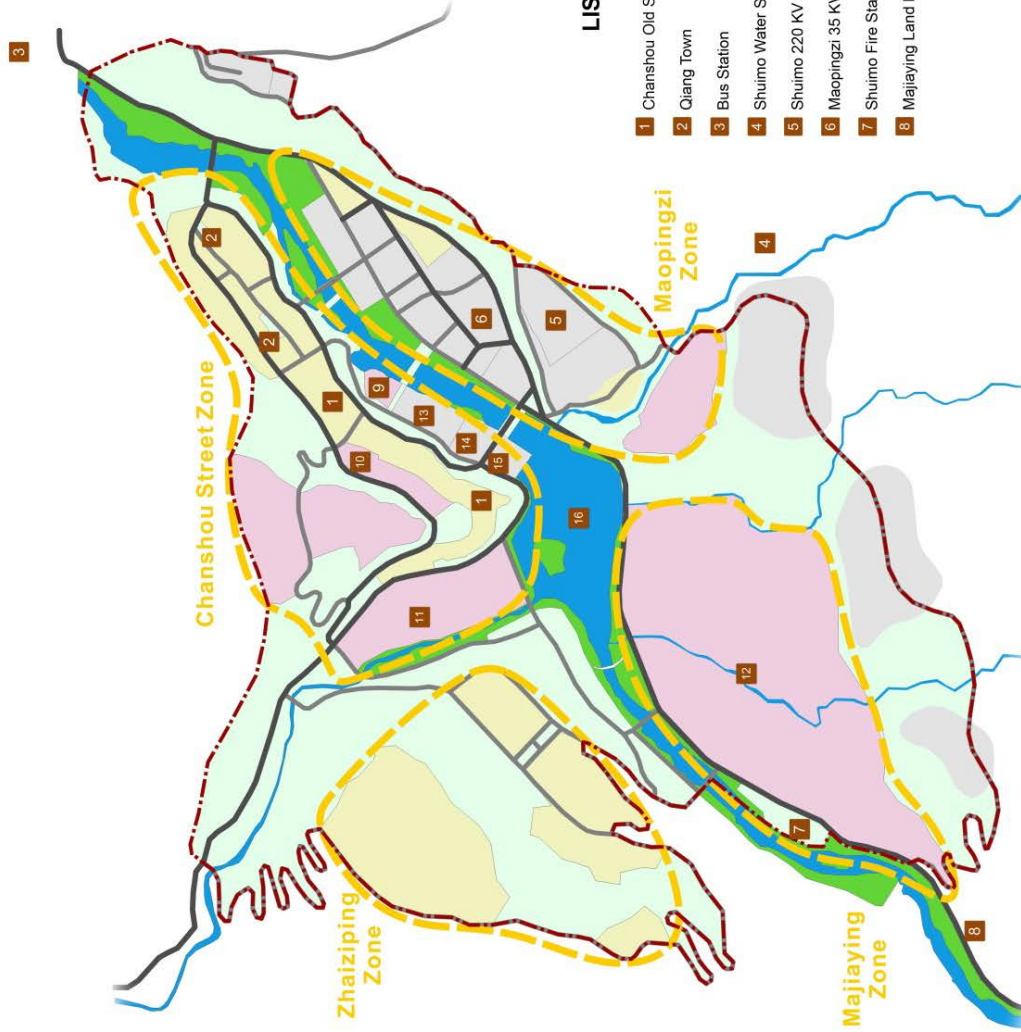
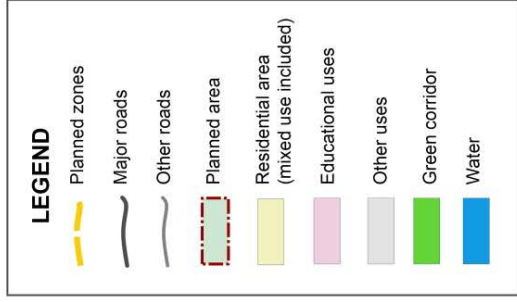
the Council of the Global Forum on Human Settlements (GFHS) held a ceremony in Dujiangyan on April 28, 2010 (H. Liu, 2011, p. 148).

In the following year, the 2011 China International Cultural Tourism Festival in Sichuan, co-sponsored by the National Tourism Administration and the People's Government of Sichuan Province, convened in Shuimo on April 18, indicating the position of Shuimo in tourism in post-disaster Sichuan Province (H. Liu, 2011, p. 150). Around 600 delegates from more than 60 countries attended the month-long event, including representatives from the Pacific Asia Travel Association, the World Tourism Organization, and the World Travel and Tourism Council ("China: International tourism festival to open in post-quake Sichuan," 2011).

Table 7 Awards Entitled to Shuimo in the Wenchuan County Post-Disaster Recovery Plan and Design Contest

Items	Award	
	Title	Level
Post-disaster Recovery and Reconstruction Plan in Shuimo	Post-disaster Recovery Township Plan	First Award
Post-disaster Recovery and Reconstruction Urban Design in Shuimo	Urban Design	First Award
Individual Design of Shuimo Middle School (Wenchuan No.2 Middle School)	Urban Design	First Award
General Plan of Shuimo	Comprehensive Plan	Second Award
Post-disaster Reconstruction Design of Chanshou Old Street	New Rural Development and Post-disaster Housing Recovery	Second Award
Foshan Assistance Group	Best Organization Award	

Sources: (Chen & Yin, 2010, pp. 8, 146; Foshan Assistance Group, 2010, p. 44; H. Liu, 2011, p. 49).



LIST OF PROJECTS

- 1 Chanshou Old Street
- 2 Qiang Town
- 3 Bus Station
- 4 Shuimo Water Supply Plant
- 5 Shuimo 220 KV Substation
- 6 Maopingzi 35 KV Substation
- 7 Shuimo Fire Station
- 8 Majiaying Land Fill
- 9 Wenchuan No.2 Kindergarten
- 10 Bayi Primary School
- 11 Shuimo Middle School
- 12 Aba Normal College
- 13 Shuimo Health Center
- 14 Shuimo Welfare Center
- 15 Cultural Activity Center
- 16 Shouxi Lake

Figure 8 Key Reconstruction Projects in the Central Village of Shuimo

3.4.2 Housing

According to the household survey, housing was among the top concerned issues among surveyed residents⁴² (HH Survey, Q40) and a majority of the interviewees believed their current residences were about the same or better than their pre-quake residences in general⁴³ (HH Survey, Q33_M). After the reconstruction, Shuimo has a total residential building area of more than 70,000 square meters (753,500 square feet), leading to an average living area of 35 square meters (377 square feet) per person and 111 square meters (1,195 square feet) per household (H. Liu, 2011, p. 173). Based on the survey results, however, only about one-third of the interviewees felt their living areas were bigger than before the earthquake⁴⁴ (HH Survey, Q39_A). The proportions of interviewees living in single-family houses and multi-family houses did not change after the recovery, but the building materials used in many of the houses were different: more residences used reinforced concrete, while fewer residences adopted wooden structures⁴⁵ (HH Survey, Q0-2, Q0-3, Q5 & Q6).

There were three modes of rehousing in Shuimo: Placement in situ, placement nearby, and

⁴² In the question to “select five issues that attract the most of your attentions during the recovery process, and order them from 1 to 5”, 39 out of the 49 interviewees selected “housing” as their concerns, 32 of which listed it as their top concern.

⁴³ Refer to Appendix D for detailed summaries of Q33 and Q34 from the household survey. “Q33_M” means the column marked with “M” in the attached figure in Appendix D.1. This applies to the rest of the thesis.

⁴⁴ In the comparison of current post-recovery residences and pre-quake residences, only 9 interviewees felt their current residences were “much larger” than their previous one; 9 interviewees answered “larger”; 6 interviewees answered “smaller” and another 10 interviewees answered “much smaller”; and the rest 15 interviewees said their current residences had almost the same building area as the previous residences (HH Survey, Q39_A).

⁴⁵ Among the 49 interviewees, 29 lived in single-family houses and 20 lived in multi-family houses before the earthquake (HH Survey, Q5). The numbers did not change after the recovery (HH Survey, Q0-2). Before the earthquake, 13 interviewees lived in houses built by reinforced concrete and 20 interviewees lived in houses with wooden structure (HH Survey, Q6). The two numbers after the recovery were 25 and 9, respectively (HH Survey, Q0-3). The numbers of residences constructed with masonry was 14 before the earthquake and 10 after the recovery (HH Survey, Q0-3 & Q6). These results from our household survey appeared to conflict with the claims of adopting traditional building structures in the Qiang Town Project and the Chanshou Old Street Project. Given the facts that the two projects were only part of the housing reconstruction and our interviewees were not randomly selected, however, the discrepancies are understandable.

concentrated placement⁴⁶ (Chen & Yin, 2010, p. 113). Although several interviewees said that they wanted to move to larger cities, such as Chengdu and Dujiangyan⁴⁷ (HH Survey, Q35), most of them were placed in situ or near their previous housing⁴⁸ (HH Survey, Q17 & Q21). A few households were relocated through concentrated placement, when their previous houses were destroyed during the earthquake or the previous settlement locations became sites of Shuimo Middle School, Aba Normal College, green belt, and other public uses⁴⁹ (HH Survey, Q18 & Q22). The major housing projects for residential resettlement are Chanshou Old Street Project, Shuimo Qiang Town Project, and Guojiaba Qiaoxinju Project.

3.4.2.1 Chanshou Old Street Project

The 1,300 meter⁵⁰ Chanshou Old Street was located at the heart of the central village in Shuimo (Foshan Counterpart Assistance Group, 2010, p. 130). The street parallels the Shouxi River, and its concentration of ancient buildings offers a great opportunity to develop into a commercial street for tourism development. Thus, beyond reconstruction of the street itself and the seriously damaged residences, an additional task of the Chanshou Old Street Project was to renovate existing residences into styles that conformed to the overall design. In most cases, to renovate

⁴⁶ The saying of “concentrated placement” was translated from the Chinese language. While it does not necessarily equal to relocation in another place, the term usually refers to large-scale concentrated residential development and construction which results in longer distances between the original sites and new homes of local residents. Here it means concentrated reconstruction of residences that has changed the appearance and the sense of communities (Chen & Yin, 2010, p. 113).

⁴⁷ In responses to the question “Do you want to move to cities if permitted”, 15 out of the 49 interviewees answered “yes”. Most of them wanted to move to “Chengdu”, “Dujiangyan” and other large cities, while one interviewee added the central village of Shuimo as one potential destination if possible.

⁴⁸ By July 2011, 19 out of the 49 interviewees lived in the same house at the same location as they did before the earthquake, and the other 30 interviewees no longer lived in the pre-quake residences (HH Survey, Q17). Fourteen interviewees lived in reconstructed houses at their previous settlement locations; nine interviewees were relocated within one kilometer from their previous settlement locations; two interviewees were relocated 2.5 kilometers away from the previous settlement locations; only one interviewee was relocated 50 kilometers away (HH Survey, Q21). The numbers of interviewees do not add up to 49 because some of them did not respond to Q21 in the household survey.

⁴⁹ Among the 30 interviewees who did not live in the pre-quake residences (HH Survey, Q17), 21 did not move back to their previous residences because of the damage to the residences, and 7 interviewees did not move back due to the planned relocation (HH Survey, Q18).

⁵⁰ Other sayings about the length of the street are 800 meters (Chen & Yin, 2010, p. 103; Z. Tang & Zhang, 2010, p. 1215) and 1,200 meters long (W. Li, 2009).

meant to tear down and rebuild, although the residents might come back to the exact location they used to be. The Foshan Assistance Group tore down a total number of more than 150,000 square meters (161,500 square feet) of residences and relocated 722 households, with 2520 residents (H. Liu, 2011, p. 173). The Project itself along this street accommodated 250 households after completion, with its total building area of 20,000 square meters (215,300 square feet) (Foshan Assistance Group, 2010, p. 250). The Chanshou Old Street Project cost a total investment of more than 30 million yuan (approx. 4.4 million US dollars)⁵¹, and was divided into two implementation phases (Q. Li, 2011; Z. Tang & Zhang, 2010, p. 1215). During the first phase by May, 2009, 86 households on 282 meters of the street were relocated, mostly in-situ; Only four households were relocated near their initial housing location (Chen & Yin, 2010, p. 113; W. Li, 2009). The project applied the traditional pattern of a household with a store in the front and yard on the back⁵², and the houses along the Chanshou Old Street were renovated into vertically mixed use in functionality, with commercial use on the first floor. Refer to Figure 8 for the location of the project.

⁵¹ For more details about the Chanshou Old Street Project, refer to Section 6.2.4.

⁵² It was unknown to us whether this kind of traditional housing pattern existed on the street before the earthquake. My guess was not, at least for the stores attached to the front side. This pattern was called a traditional pattern because it had been considered as an ideal housing model since the ancient times in China, according to the ancient Chinese literature *Kao Gong Ji*.



Figure 9 Chanshou Old Street

3.4.2.2 Shuimo Qiang Town Project

The Shuimo Qiang Town Project was one of the key projects in the reconstruction of Shuimo, located at the entrance of Shuimo's Central Village. This 128.65 million yuan (approx. 18.9 million US dollars) project placed 350 households⁵³, with 170 single family buildings⁵⁴ of more than 10 types (H. Liu, 2011, p. 138). There were three main streets staggered with a dozen pedestrianized roadways, a farmers' market, and several public squares (Foshan Counterpart Assistance Group, 2010, p. 131). The total building areas reached 52,000 square meters (559,700 square feet)⁵⁵, and all buildings were built to resist 9 degrees of seismic intensity (Foshan Assistance Group, 2010, p. 131). The same as the Chanshou Old Street, buildings were designed to serve as mixed uses along the central street (also the business area) in Qiang Town following the rule of stores on the first floor and residential areas above on the second and third floors (H. Liu, 2011, p. 138). The Qiang Town Project made use of the different terrains and created a

⁵³ Or over 380 households (Foshan Assistance Group, 2010, p. 131).

⁵⁴ Or 170 residential houses, and 153 single family houses (Y. Dong, 2011, p. 26).

⁵⁵ Or 48,000 square meters (516,600 square feet) according to (Y. Dong, 2011, p. 26).

vertical feature of different layers, using mixed structures of stone, mud, and wood. Qiang Town Project not only serves as an aggregated residential area, but also becomes an AAAA scenic spot (Foshan Assistance Group, 2010, p. 131). Refer to Figure 8 for the location of the project.



Figure 10 Entrance of the Shuimo Qiang Town



Figure 11 Internal View of the Shuimo Qiang Town

3.4.2.3 Guojiaba Qiaoxinju Project

The Guojiaba Qiaoxinju Project was named to commemorate the spiritual support from the

Chinese people overseas. It was jointly funded by Foshan Municipal Government (780,000 yuan, or approx. 114,700 US dollars), Hong Kong and Macao Compatriots in Foshan (4 million yuan, or approx. 0.59 million US dollars) and overseas community groups (Foshan Assistance Group, 2010, pp. 86, 138). The project involved reconstruction of 78 residential houses, renovation of 123 residential houses and the Villagers' Activity Center (Y. Dong, 2011, p. 26; Foshan Assistance Group, 2010, p. 138). It also created a unified Qiang style among all the buildings, upgraded the roads and water pipelines, established a new stadium and a new garbage pool, and also promoted greening along the roads. After the completion of the project, the rural village presents a standardized, clean and beautiful landscape.

3.4.3 Economic Development

During the post-disaster recovery, Shuimo realized the transformation from high energy-consuming industries and household-based peasant economy to a modern service industry and urban ecological agriculture (Foshan Assistance Group, 2010, p. 64). Thus the employment status and level of income of many local residents and households also have changed.

3.4.3.1 Relocation of High Energy-consuming Industries

On August 6, 2008, all enterprises in the Shuimo Industrial Park met together to convey the spirit of the Fifth Plenary Session of the Ninth Aba Commission, requiring preparation for the relocation of businesses and discouraging technical improvements to the local industrial plants at this stage (Z. Tang & Zhang, 2010, p. 1214). After several communications, a series of high energy-consuming and highly polluting factories left Shuimo, including the silicon plant, magnetic industry plant, gem factory, calcium carbide plants, ironworks, cement plant, etc. (H. Liu, 2011, p. 175). Only five low-emission plants were left in Shuimo, out of the original total of 63 (Z. Tang & Zhang, 2010, p. 1214).

3.4.3.2 Tourism as the Dominant Industry

Shuimo joined its neighboring townships in developing a regional tourism zone. For instance, Shuimo and Sanjiang (adjacent to Shuimo) attracted 150 billion yuan (approx. 22 billion US dollars) investment from Guangdong Provincial Government and built hotels that could accommodate up to 1,500 tourists (2009). In addition, many local households participated in the development of farmhouse tourism, greatly increasing the local capacity for accommodations. Now, more than 20,000 tourists visit Shuimo every day, and during holidays, this number exceeds 100,000 per day (Zhongguo Gongcheng Zixun Xiehui, 2012). According to an incomplete statistic, around 30 percent of Wenchuan County's population worked in tourism and related industries (X. Zheng & Yang, 2010, p. 13). I visited Shuimo in January⁵⁶, 2014, and I was not expecting many tourists there before my arrival. To my surprise, the Chanshou Old

⁵⁶ January was not supposed to be the most attractive season for tourists, compared to the summer time from June through August.

Street was filled with tourists, gathering around local stores and restaurants. Although I was not confident enough in the reliability of the statistical numbers above, this vision of livelihood impressed me greatly and made me believe that the tourism development in Shuimo was on the right track.

3.4.3.3 Prosperity of Modern Agriculture

Another change is the modernization and broadening of agriculture. Local governments learned the “Company-Base-Household” model⁵⁷ from Guangdong’s experience, strengthened leading enterprises, developed urban ecological agriculture, and introduced new methods to farmers (Foshan Assistance Group, 2010, p. 69; H. Liu, 2011, p. 174). One particular case is the enhancement of tea production in Shuimo. Shuimo Township Government conducted industrial support for Aba Jiuzhai Tea Co., investing 3.5 million yuan (approx. 0.51 million US dollars) for the plant recovery and expansion and introducing a new tea production line (Foshan Assistance Group, 2010, p. 68; Z. Tang & Zhang, 2010, p. 1215). As a result, the annual production of the company increased to 450 tons per year, which is six times the pre-quake production (Z. Tang & Zhang, 2010, p. 1215). Now, the company has attracted more than 1,000 households to supply tea leaves for the company (H. Liu, 2011, p. 175). With strong government support and the powerful leadership of Aba Jiuzhai Tea Co., a tea economic belt is emerging, creating a new economic chain from tea industry base to tea culture tourism (Z. Tang & Zhang, 2010, p. 1215).

Another example of government support in modern agriculture is the Youngjun Duck Industry. In June 2009, Yongjun Peng and the Wenchuan County Government achieved an agreement to establish an ecological duck breeding base in Lianshanpo Village, Shuimo. The government provided financial support for the infrastructure construction serving Yongjun Duck Industry, as stated in the agreement, including ditches, electricity, gas digester, and transportation from the plant to the main road in the village (Z. Tang & Zhang, 2010, pp. 1215-1216). Yongjun Peng was still hesitating whether to carry out further processing in Shuimo, when, in November 2009, Lidong Qing visited his company during his visit to Shuimo and confirmed Yongjun’s belief in

⁵⁷ This means that farmers supply original agricultural productions to the base for further processing, while companies sign contracts with local farmers and provide technological support and sales networks. Each side takes full use of their own comparative advantage in the producing procedure. See the example of supporting tea production in the second half of this paragraph and more detailed explanation in Section 4.1.3.

the possibility of providing job opportunities and increasing local income at the same time (Z. Tang & Zhang, 2010, pp. 1215-1216). The processing of ecologically bred ducks added value to the products and expanded market sales as well. It was the government funding, policies, as well as emotional support, that led to the win-win outcome, as Yongjun Peng later said.

In addition, Shuimo also adopted a variety of policies to develop agro-industry. Local government cooperated with Jiaxin Agricultural Development Co., Ltd., and launched the Shuimo Modern Agricultural Demonstration Park, which produces flowers and edible mushrooms with 70 mu (11.5 US acres) of land and more than 20,000 square meters (215,300 square feet) of greenhouses (Z. Tang & Zhang, 2010, p. 1215). For Minjiang Sweet Cherry Industry Co., Ltd., the Shuimo Township Government also arranged recovery funding of 36 million yuan (approx. 5.3 million US dollars) for the reconstruction of buildings, expansion of the plant base, and the renovation of production lines (Z. Tang & Zhang, 2010, p. 1215).

All these government contributions to the enterprises have encouraged the agro-industry, and Shuimo now has 2,400 mu (395 US acres) of kiwi fruit, 500 mu (82 US acres) of Tie Guanyin, 1,500 mu (247 US acres) of traditional medical herbs, 31 mu (4.6 US acres) of flower base, and 15 households of large pig farming units (H. Liu, 2011, p. 174). Other economic crops include cherry, ginkgo, yew etc. (Foshan Assistance Group, 2010, pp. 68-69; H. Liu, 2011, p. 174).

3.4.3.4 Employment and Income

With these changes in economic development and industrial transformation, the average income of local residents has significantly increased (H. Liu, 2011, pp. 129-130). Annual income per capita has reached more than 3,000 yuan (approx. 441 US dollars), and is increasing steadily (H. Liu, 2011, p. 175). For example, the per capita net income in Laoren Village reached 3,549 yuan (approx. 522 US dollars) in 2009 (Meng, 2011, p. 57). In Xianfengyan Village, the 2009 per capita net income achieved 3,250 yuan (approx. 478 US dollars), which was 1,442 yuan (approx. 212 US dollars) and 44 percent higher than the previous year (Y. Dong, 2011, p. 26).

Many of the residents in Shuimo used to rely on hourly work in the industrial plants in addition to their own agricultural productions. After the recovery, some of them lost their land and could

not rely on agricultural income⁵⁸ (HH Survey, Q36 & Q37), and some others were no longer able to earn extra money from local factories after the industrial relocation. In another word, a few local residents lost part of their economic sources. Guiting Sun in the Laoren Village was among these people. Now he has become a self-employed landlord, which he would have never imagined during the decades of working in factories (Z. Tang & Zhang, 2010, p. 1217). He changed the old way of thinking and rent out his own houses to a stationery store. Since his place was located just beside the Chanshou Old Street, the most prosperous commercial street in the Central Village of Shuimo, the rent for his 30~40 square meter store was 800 yuan per month, equivalent to one month's income of workers in the factory (Z. Tang & Zhang, 2010, p. 1217).

With steady and increasing sources of income, many of the local villagers now enjoy a better living condition and can afford private cars or motorcycles. Private car ownership increased by five times than before the earthquake, with a net increase of around 200 cars in total, and the rent for a store on the street was three to five times the rent before the quake (H. Liu, 2011, pp. 129-130, 175). According to the statistics from the Shuimo Township Government conducted by May 12, 2010, the second anniversary after the Wenchuan Earthquake, many migrant workers had come back to Shuimo, indicating the quality of life has been significantly improved.

⁵⁸ Among the 49 interviewees, 20 listed agricultural sector (farming, breeding, etc.) as a major economic source of the household before the earthquake, while only 4 listed it as a major economic source of the household after the recovery (HH Survey, Q36 & Q37).

3.4.4 Infrastructure

3.4.4.1 Internal Transportation

(1) Road Construction in the Central Village of Shuimo

The total investment for road construction within the Central Village of Shuimo was 68 million yuan (approx. 10 million US dollars), leading to a 5 kilometer long major road system with five roads (Foshan Assistance Group, 2010, p. 135). All the new roads took full advantage of the existing topography and were paved by high quality asphalt concrete. The construction greatly improved traffic conditions and access to Shuimo, and also determined the main framework of the urbanization pattern in Shuimo. For instance, the five major roads effectively connected the four functional zones⁵⁹ in the Central Village, well preparing Shuimo for further population aggregation.

For rural areas, investment in road construction also exceeded 6 million yuan (approx. 0.88 million US dollars) (Foshan Assistance Group, 2010, p. 139). More than 10 kilometers of cement concrete roads were constructed between villages in Shuimo (as mentioned in Section 3.3.2.2). As a consequence, every village in Shuimo now has a cement road connecting to the outside world, adding to the convenience of individual travel, the outbound sales of economic crops, as well as the operation of home-owned restaurants and hotels. Moreover, the new rural road connecting Laoren Village and Zhaojiaping Village (in the Town of Xuankou), together with the existing highway system, has created a ring road highway network among 22 villages⁶⁰ (Zhong, 2010). All of these advantages have enhanced the transportation services for local farming, aquaculture, and tourism, contributing to the increase of overall income of local villagers.

(2) Bridges

⁵⁹ According Keshi Chen's plan, new Shuimo was characterized as "One Lake, Two Shores and Four Zones" (H. Liu, 2011, p. 172).

⁶⁰ This was the greatest improvement in the accessibility of the rural areas. Before the earthquake, there were more than 60 km of rural roads in total, connecting villages to Xuankou-Sanjiang Highway crossing Shuimo (Chen & Yin, 2010, pp. 22-23). Each of the villages was connected to the central villages, but there were no concrete highway connections between the scattered villages in Shuimo. However, after the reconstruction process, it was much more convenient to travel from one village to another, including some villages in other towns.

During the recovery, six new bridges were built with the assistance from Foshan, and they were each named for the city and its five districts: Foshan Bridge, Chancheng Bridge, Shunde Bridge, Nanhai Bridge, Sanshui Bridge, and Gaoming Bridge (Foshan Assistance Group, 2010, p. 134; H. Liu, 2011, p. 125). The engineering design was supposed to resist 8 degrees of seismic intensity and floods of 100-year frequency (Foshan Assistance Group, 2010, p. 134; H. Liu, 2011, p. 125). After their completion in March 2010, these bridges improved the connectivity between both sides of the Shouxi River (H. Liu, 2011, p. 127). Furthermore, the bridges were designed to be compatible with the surrounding environment, adding to the beauty of the general landscape.

3.4.4.2 External Transportation Connections

Shuimo used to be at the end of the Xuankou-Sanjiang Highway, and right off the National Highway G213. It required a special detour to enter and exit Shuimo, and thus the town had been marginalized for a very long time (H. Liu, 2011, p. 14). During the post-disaster recovery process, there were several changes to the regional transportation system making Shuimo more accessible to the outside world:

(1) A rail line opened in May 2010, reducing the traveling time from Chengdu to Dujiangyan and Mount Qingcheng to less than one hour. After the Qingcheng-Shuimo highway is completed, Shuimo will be only 15 minutes from the rail station at Mount Qingcheng, which means that Shuimo is within the “one-hour economic belt around Chengdu” as the Southern Gate of Wenchuan County (H. Liu, 2011, p. 27).

(2) I have found during my field observation that the bus service from Dujiangyan to Shuimo is very convenient. Every 7 minutes, there is a bus from Dujiangyan to Shuimo during the daytime, and the bus stops at the Shuimo Station about 15~20 minutes’ walk from the Central Village of Shuimo. Refer to Figure 8 for the location of the bus station, Figure 12 for its appearance, and Figure 13 for the most current service routes by January, 2014.



Figure 12 Shuimo Bus Station

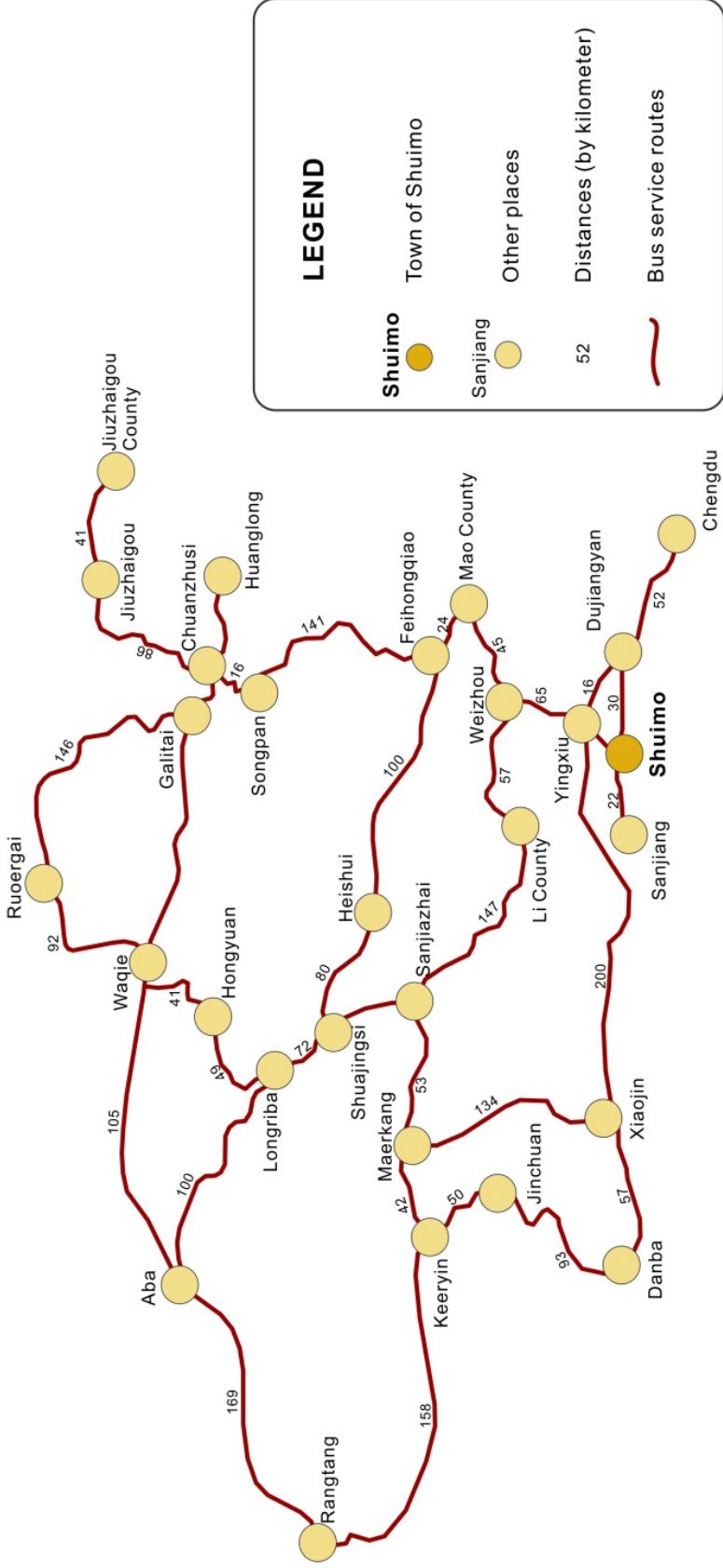


Figure 13 Bus Service Routes from Shuimo

Note: This figure is a copy of the route map displayed in the Shuimo Bus Station.

3.4.4.3 Water Supply

After the reconstruction, water supply conditions in Shuimo have been greatly improved⁶¹, with new water plants built in Dayandong and old water plants renovated in Maopingzi Village. All residents of Shuimo now have access to clean water (Zhongguo Gongcheng Zixun Xiehui, 2012).

The main project for the Central Village was the Shuimo Water Supply Plant and a new water supply pipe network. The water plant, as the first modern water plant in accordance with national standards, covered 9.03 mu (1.49 US acres) of land, and its total investment cost 20 million yuan (approx. 2.9 million US dollars). The designed water supply capacity was 5,000 tons of water per day, and the long-term goal was 10,000 tons per day to meet the needs of more than 30,000 residents in the Central Village (Foshan Assistance Group, 2010, p. 133). The water was from Dayandong Ditch in the deep mountains, and transported to the township through a water pipe system after precipitation and four modern purification processes. The water distribution pipe network reached all water-consuming points on both sides of the Shouxi River. It was 19.8 kilometers (12.3 miles) long in total, and cost around 15 million yuan (approx. 2.2 million US dollars) (Foshan Assistance Group, 2010, p. 133).

As for rural areas, the water supply infrastructure improvement projects included: (1) the Maopingzi Water Plant Project; (2) the Rural Drinking Water Project in Shuimo; and (3) the Baiguoping Water Supply Project, which was funded by the Foshan Overseas Association and co-constructed by the Foshan Assistance Group and local villagers⁶² (Foshan Assistance Group, 2010, pp. 86, 139).

3.4.4.4 Others

In addition to transportation and water supply, the post-disaster recovery also covered

⁶¹ There used to be only one water plant in Maopingzi Village before the Wenchuan Earthquake, which was put into use in 2003 and supported both residential and industrial uses (Chen & Yin, 2010, p. 27). Water supply was recovered 15 days after the quake, but the water quality could not achieve technical standards during storms due to the damage of pipelines and the surrounding land cover (Chen & Yin, 2010, p. 27).

⁶² Refer to Appendix C.2 for details.

improvement in sewage treatment, power supply, and communication.

Before the earthquake, no sewage treatment plant existed in Shuimo. Residential and industrial wastewater was discharged into Shouxi River without treatment (Chen & Yin, 2010, p. 27). Two new treatment plants were built during the recovery process.

Two hydroelectric power stations were in use before the earthquake, one in Guojiaba Village and another in Heitupo Village, and both of them restored electricity supply on June 15, 2008. A third one was under construction at the time of the earthquake (Chen & Yin, 2010, p. 28).

Table 8 Infrastructure Recovery in Shuimo

Category	Name	Recovery type	Land area (US acres)	Capacity (ton/day)
Water supply	Dayandong Water Plant	Newly built	0.74	5,500
	Chenjiashan Water Plant	Newly built	0.62	700
	Shuimo Water Plant	Expanded in situ	0.49	3,000
Sewage treatment	Guojiaba Sewage Treatment Plant	Newly built	3.36	4,800
	Baiguoping Sewage Treatment Plant	Newly built	0.37	400
Electricity	Shuimo 220KV Substation	Newly built	5.67	
	Guojiaba 110KV Substation	Retained from existence	1.16	
	Baiguoping 110KV Substation	Retained from existence	1.37	
	Maopingzi 35KV Substation	Retained from existence	0.68	
Communication	Shuimo Communication Branch	Relocated	0.25	
Postal services	Shuimo Postal Service Branch	Relocated	0.19	
	Baishi Postal Service Station	Newly built	0.19	
Fire control	Shuimo Fire Station	Newly built	1.5	

Source: (Shuimo Township Government & Foshan Academy of Urban Planning and Design, 2009).

3.4.5 Public Facilities

3.4.5.1 Education

Before the earthquake, Shuimo had one middle school (the Shuimo Middle School⁶³), one private kindergarten, two primary schools in the Central Village⁶⁴ and 11 primary schools in rural villages. The enrollment rate in primary and secondary schools was 98 percent, and the literacy rate is 97.24 percent (Chen & Yin, 2010, p. 22). Beyond the improvement of the previously existing schools after the earthquake, a couple of institutes were attracted to Shuimo, including the Aba Normal College and the Sichuan Conservatory of Music (P. Xu et al., 2014, p. 441). Thus a new educational chain from kindergarten to college has been created in Shuimo (Foshan Assistance Group, 2010, p. 80). Here I will introduce in detail three examples, and a full list of schools and colleges can be found in Table 9.

(1) Wenchuan No. 2 Kindergarten

The Wenchuan No. 2 Kindergarten is a medium-size kindergarten, with a total building area of over 2,500 square meters (26,910 square feet) and a capacity of more than 200 children (Y. Dong, 2011, p. 27). The kindergarten was the first standardized kindergarten in Shuimo. It followed the standards of the more developed Guangdong Province, and facilities beyond classrooms include music rooms, administrative offices, kitchen, roads, and landscaping. (Foshan Assistance Group, 2010, p. 142). The Foshan Fiscal Bureau invested 12 million yuan (approx. 1.76 million US dollars), and the Foshan Women's Association further donated 2.53 million yuan (approx. 0.37 million US dollars) to it (Foshan Assistance Group & Peking University Institute of Urban Design; S. Liu, 2008). This project was assisted by the Foshan Assistance Group and completed in August, 2009.

(2) Shuimo Middle School

⁶³ Only one teacher was injured during the earthquake. No buildings collapsed and no one died (Chen & Yin, 2010, p. 26).

⁶⁴ One of the primary schools was on the Chanshou Old Street, and after its reconstruction assisted by The Second Artillery Force of the People's Liberation Army (PLA), the school was named the Bayi Primary School after the army (Foshan Assistance Group, 2010; H. Liu, 2011, p. 86).

Shuimo Middle School (also known as the Wenchuan No. 2 Middle School) was relocated to the west of Laoren Village north of the Shouxi River in the Central Village of Shuimo (Foshan Assistance Group, 2010, p. 141). The total investment for reconstruction was almost 170 million yuan (approx. 25 million US dollars) from the Foshan Fiscal Bureau, and the Hong Kong Government also invested in some of its facilities (Foshan Assistance Group, 2010, pp. 86, 141). The school was designed to resist IX degrees of seismic intensity. The capacity of the Shuimo Middle School is 52 classes and around 2,400~3,000 students (Y. Dong, 2011, p. 26). It also has a 300-meter track and field, an artificial grass soccer field, an indoor basketball court, multimedia rooms, and a couple of laboratories. Furthermore, after completing the reconstruction in August, 2009, the Foshan Assistance Group also assisted the creation of the school's badge and motto, purchased uniforms for the students, and founded accounts for scholarships, providing all resources available for students (Foshan Assistance Group, 2010, p. 141). The initial funds for the scholarships in Shuimo Middle School came from a donation from the Foshan Assistance Group⁶⁵ and the Foshan fiscal system, accounting for 300,000 yuan (approx. 44,000 US dollars).



Figure 14 Shuimo Middle School

The Shuimo Middle School was supposed to serve the surrounding townships as well, including Yingxiu, Xuankou as well as Sanjiang. On September 1, 2009, over 2,000 students from the

⁶⁵ The Foshan Assistance Group and the designers donated their awards (around 100,000 yuan, or approx. 14,700 US dollars) from the “Wenchuan County Post-Disaster Plan and Design Contest” into the special account of scholarships in the Shuimo Middle School.

previous Shuimo Middle School and Xuankou Middle School started their lessons again (H. Liu, 2011, p. 83).

(3) Aba Normal College

Aba Normal College was the only higher educational institution in Aba Prefecture, and the only one of its type relocated during the post-disaster recovery process (Sun, 2012; Yin & Fu, 2009). As a state-owned institution, Aba Normal College was relocated and rebuilt in Shuimo with national investment (Foshan Assistance Group, 2010, p. 86). The total building area was 230,000 square meters (2,475,700 square feet), and the new campus opened in March 2011 (Sun, 2012; Yin & Fu, 2009). Now there are around 7,000 full-time students and about 400 teachers.



Figure 15 Main Gate of the Aba Normal College

3.4.5.2 Service Centers

There used to be a health center and a cultural transmission station in Shuimo before the earthquake. Over 18 mobile cultural centers were built in rural villages over time to spread scientific and cultural knowledge (Chen & Yin, 2010, p. 22). During the post-disaster recovery, some impressive improvements were made, and some examples are as follows.

(1) Health Centers

The previous Shuimo Health Center was relocated and reconstructed, with an investment of 19 million yuan (approx. 2.8 million US dollars) from the Foshan Financial Department (Y. Dong, 2011, p. 26; Foshan Assistance Group, 2010, p. 132). Design of the Health Center followed the traditional Qiang and Tibet styles (Foshan Assistance Group, 2010, p. 132). In addition, another health station was newly built in Baishi Village. Completion of these health centers have increased the total capacity of healthcare to 110 beds, and have greatly enhanced the local health care conditions and disease control levels.

(2) Welfare Center

The Shuimo Welfare Center Project was the first welfare center in Shuimo and its surrounding area, and it provided accommodations and services for up to 300 orphans and aged widows and widowers from the villages nearby. Facilities in the welfare center include living rooms, medical room, sports room, administrative offices, and logistics (Foshan Assistance Group, 2010, p. 136). With a total investment of 26 million yuan (approx. 3.8 million US dollars) from the Foshan Fiscal Bureau, the center was built with a reinforced concrete frame structure, and was expected to resist 8 degrees of seismic intensity (Foshan Assistance Group, 2010, p. 136).

(3) Cultural Activity Center

The Cultural Activity Center (also called the West Qiang Hui), located by the Shouxi River, was designed to be the center for cultural events in the southern part of Wenchuan County. The project cost 20 million yuan (approx. 2.9 million US dollars) from the Foshan Fiscal Bureau, and was designed to resist 8 degrees of seismic intensity (Y. Dong, 2011, p. 24; Foshan Assistance Group, 2010, p. 137). It is a three-story building, composed of a Qiang-style tower, a curtain wall of glass, and a steel-structured roof, and it includes a video conference space, reconstruction planning exhibition, and Foshan ceramic art show (Foshan Assistance Group, 2010, p. 137).

(4) Public Service Rooms in Rural Villages

All 18 villages were involved in this project, which provided administrative spaces for local government officials and assembly spaces for local villagers to learn, to receive medical care,

and to recreate. The budgeted investment was 6.75 million yuan (approx. 0.99 million US dollars) (Foshan Assistance Group, 2010, p. 139).

3.4.5.3 Public Spaces

The newly built sports parks and green spaces (including the Shuimo Square, the Sports Park, and the Greening Project along the Shouxi River, etc.) provided over 80,000 square meters (861,120 square feet) of public space for the residents in Shuimo. The project also aimed to integrate the fragmented water and shoreline landscapes as well as to mitigate the negative effects of potential flood and landslide hazards (Foshan Assistance Group, 2010, p. 140). The budgeted investment for the public spaces was 37 million yuan (approx. 5.4 million US dollars) from the Foshan Fiscal Bureau.

Table 9 Recovery of Public Facilities in Shuimo

Category	Name	Recovery type	Capacity	Land area (US acres)	Building area (square feet)
Education	Aba Normal College	Newly built	8,000 students	77.16	
Education	Aba Radio and Television College	Newly built	3,005 student	3.3	1,496
Education	Weizhou Normal School of ethnic groups	Newly built	1,500 students	9.76	3,540
Education	Shuimo Middle School (Wenchuan No. 2 Middle School)	Relocated	1,800 students	14.89	4,267
Education	Shuimo Primary School	Expanded in situ	950 students	3.27	1,176
Education	Aba Teaching Center	Newly built		0.78	82
Education	Wenchuan No. 2 Kindergarten	Newly built	200 students	1.14	238
Education	Baishi Kindergarten	Newly built	50 students	0.38	41
Culture	Museum	Newly built		1.39	
Culture	Cultural Activity Center	Newly built		2.5	1,078
Culture	Radio and Television Center	Newly built		0.28	
Culture	Exhibit Center	Newly built		3.12	
Sports	Sports Center	Newly built		1.56	
Health care	Shuimo Health Center	Relocated	100 beds	2.28	472
Health care	Baishi Health Care Station	Newly built	10 beds	0.22	74
Welfare	Shuimo Welfare Center	Newly built	300 beds	2.18	697
Transportation	Bus Station	Newly built		0.95	

Source: (Shuimo Township Government & Foshan Academy of Urban Planning and Design, 2009).

3.4.6 Security

Safety requirements are always among the top concerns in post-disaster recovery. Through my research, I have identified three aspects of security concerns addressed in Shuimo: resistance to future earthquakes, fire, and floods.

All buildings built by Foshan on behalf of Shuimo were claimed to meet earthquake construction standards. When Guangdong Province set up the fixed deadlines for the reconstruction of middle schools with “no room for bargaining” (H. Liu, 2011, p. 78), they required reconstruction with both speed and quality: Resistance to 9 degrees of seismic intensity and a safe construction process. Public buildings are supposed to resist 9 degrees of seismic intensity (Zhongguo Gongcheng Zixun Xiehui, 2012). One example is the Shuimo Middle School. Design of the school followed the highest seismic requirements, and thus the total steel used for the only four-story main building was sufficient to build a 30-story building. Even if someday in the future, an earthquake should destroy all the cement, the steel frame would still not fall apart (H. Liu, 2011, p. 78). Building structures for all post-disaster recovery projects met the requirements from the higher level of government, and they have survived the multiple aftershocks. Yet at this moment, we still do not know whether or not they can survive huge earthquakes in the future.

In order to maintain the traditional architectural style on the Chanshou Old Street, many of the mixed use buildings along the street adopted wooden structures, which increased their vulnerability to fire. The Foshan Assistance Group were well aware of such risks, and they took two approaches to address the issues: (1) All the wood used in the buildings were pre-processed to be fire-resistant (H. Liu, 2011, p. 131); (2) The recovery plan designed a new open water system inside the central township area, which would make it easier for firemen to get water when necessary.

Regarding flooding, the Shouxi Lake Hazard Mitigation Project cost over 100 million yuan (approx. 14.7 million US dollars) and served three functions: (1) the key water conservancy project for flood control and hazard mitigation; (2) the core project of ecological restoration in eco-towns in Wenchuan County; (3) emergency public shelter. The design of the Shouxi Lake Project followed the traditional principles of Bing Li designing the Dujiangyan Water

Conservancy Project, separating a 28,000 square meter (301,400 square feet) inner lake through a man-made cofferdam and creating multi-channel rolling dams with layers of waterfalls in the outer lake. To ensure the flood control requirements, landscape effects, as well as a low maintenance cost in the long term, the Foshan Assistance Group also invited the National Laboratory at Sichuan University to run a hydraulic modeling experiment. Meanwhile, about 50,000 square meters (538,200 square feet) of green spaces were restored on both banks of the lake, and may serve as a public shelter when an emergency occurs (Y. Dong, 2011, p. 27; Foshan Assistance Group, 2010, p. 143). The best way to evaluate these designs is by their actual performance. During the once-in-a-century great flood in the summer of 2010, the functional design of the inner and outer lakes performed quite well (perfectly completed the task of flood discharge) and the town of Shuimo did not get flooded, even though the precipitation in Shuimo was greater than some of the other recovered towns most seriously flooded, including Yingxiu, the central town in the Wenchuan Earthquake (H. Liu, 2011, p. 120; Zhongguo Gongcheng Zixun Xiehui, 2012).



Figure 16 Open Water System in the Chanshou Old Street

3.4.7 Scenery

The more than 160,000 square meters (1,722,200 square feet) of lake and over 3,000 meter (1.8 miles) long shoreline not only served as a shield protecting the people of Shuimo from flooding, but also provided a unique scenic view, particularly during the severe flood in 2010. The large volume of water body created vast mist on the Shouxi River, and the scene was referred to as “the most beautiful and the most natural water scene in my whole life” by a member in the Foshan Assistance Group (H. Liu, 2011, p. 120). However, during my field trip in winter, I did not see any water in the Shouxi Lake and Shouxi Lake. Instead, there were still large machineries in the riverbed for construction or maintenance (Figure 17 & Figure 18). For tourists, this view was definitely not pleasant at all.

Scenic quality was among the key concerns of both local governments and the Foshan Assistance Group during the recovery process. They tried to take full advantage of the existing natural topography and traditional elements in history. Designers conducted an assessment of the landscape values, and attempted to enhance visual quality (Chen & Yin, 2010, p. 25). They were also aware of the beauty of the traditional architecture. The restoration philosophy was to respect history and to view culture as the key element in urban continuity (H. Liu, 2011, p. 39). The chef designer Keshi Chen found some black and white photos during the period of the Republic of China and late Qing Dynasty from the Chengdu Archives, and integrated the original characters of drama stages into the design of the Chanshou Old Street (H. Liu, 2011, p. 39).



Figure 17 Shouxi Lake under Construction



Figure 18 Construction Site of the Shouxi Lake Hazard Mitigation Project

3.4.8 Culture

The reconstruction of Shuimo, by taking in traditional and minority ethnic elements, meant more than just scenic beauty, but also reflected cultural meanings. From this perspective, every change is a step in the post-disaster cultural reconstruction process.

(1) Cultural Inheritance.

For a very long time, there was no such a concept of “city” among the minority Qiang group. For generations, the Qiang people have lived in units named *Shanzhai*⁶⁶. The traditional settlements of the Qiang ethnic group were usually widely scattered through the mountains, and few Qiang dwellings were adjacent to each other. Therefore, the Qiang people are called “the ethnic group in the clouds”. Even for the small proportion of Qiang households living in villages, there was never formal planning for these places (H. Liu, 2011, pp. 131-132). Settlements at the urban scale rarely came into existence, and a sense of community was established through changes of vertical elevations rather than agglomeration on the plane. The Qiang Town Project made use of the different terrains and created vertical layers in elevation to maintain the pattern of Qiang settlement. The designers also adopted the traditional features of Qiang buildings, using an integrated approach of stone structure, mud structure, half-stone-half-wood structure, and wooden structure (H. Liu, 2011, p. 131). The symbols of sheep⁶⁷ also appeared on the outside walls of buildings in Qiang Town. In this sense, the Qiang Town has become a carrier of the culture of the Qiang minority group (H. Liu, 2011, p. 132).

(2) Man-made Cultural Events.

Beside the physical changes, the Foshan Assistance Group also created a series of cultural events to brand Shuimo as a new cultural symbol. They started a nationwide event of “Looking for Bo

⁶⁶ The Chinese character “Shan” means mountain, and thus “Shanzhai” means settlement in the mountains.

⁶⁷ Sheep is the totem of the Qiang group. Sheep represent the characters of the Qiang people. The typical Qiang face is the look of a sheep—gentle, serene, and persistent—with the characters of goats, with gentle faces yet angry horns (H. Liu, 2011, p. 25).

Wang⁶⁸ and his Chunfeng Ge Xu” and they invited the winners to tour Shuimo. The purpose of this event was to cultivate Shuimo as the “dream place” of the literati, just as the position of Tengwang Ge in Bo Wang’s heart (Z. Tang & Zhang, 2010, p. 1216).

⁶⁸ Bo Wang was one of the most well-known ancient poets in China, and one of his poem on Tengwang Ge (an ancient tower) made the place a most popular tourism destination since then.

CHAPTER 4 LOCAL DECISION MAKING

Post-disaster recovery can be seen as a series of decision making processes, followed by actions. In the Town of Shuimo, the decisions ranged from setting goals, the making of a fair planning process, and balancing between security and landscape. Each decision inherently includes many related decisions and hard choices. While I do not intend to make judgments on the role of each participant in the decision making process, by looking into how decisions are made, we can better understand the power relations in the post-disaster recovery in Shuimo and how processes led to outcomes. This chapter will focus on the decision making in the formal processes only.

4.1 Major Decisions

4.1.1 Setting Goals

The target of Shuimo's post-disaster recovery planning was to build a new ecological town in Wenchuan and a cultural town in the West Qiang territory (Shuimo Township Government & Foshan Academy of Urban Planning and Design, 2009; P. Tang, 2011; P. Xu et al., 2014, p. 440). The consensus on this goal among the Foshan Assistance Group, local government officials and local residents did not come into existence in the beginning, but was established through a long negotiation—or, I would prefer to call it “persuasion”—process.

The first conflict was the different attitudes on developing tourism. When the Foshan Assistance Group proposed to create a commercial street, local residents had doubts about it (Z. Tang & Zhang, 2010, p. 1215). On the one hand, they viewed wooden buildings as coarse and unstable, and only those made of concrete and cement were reliable. On the other, they suspected the possibility of making money through developing tourism.

In order to persuade people in Shuimo to accept relocation and development of tourism, the Foshan Assistance Group did the following: (1) First, they compared potential increases in income: for one mu of farmland, income from agriculture use is 400 yuan; income from industrial plants is around 1,000 to 4,000 yuan; and if starting a service industry (i.e., tourism), the income can be as much as ten to a hundred thousand yuan annually. (2) They organized a visit to Luodai, Lijiang and some other tourism towns for a group of representatives of the local government officials and residents. When they were visiting Lijiang, the Chief of Laoren Village, Pingliang Yu, bought a video camera, recorded how the residents relied on tourism, and brought it to Shuimo to show to all the villagers (H. Liu, 2011, p. 61; Z. Tang & Zhang, 2010, p. 1215).

A second disagreement came from which style to select, Qiang-style or Tibetan style. The idea of building a Qiang-style town initiated from a conversation between Hongbao Liu, the leader of the Foshan Assistance Group, and one of his previous supervisors in Guangzhou, Yuan Feng (H. Liu, 2011, p. 24). Yuan Feng told Hongbao Liu about the long and thriving history of the Qiang minority group in the area, leading the latter to refer to the book “Qiang in the Tibetan Between” by Mingke Wang from his nine years' field research between 1994 and 2002. According to the

book, the Tibetan culture used to dominate the area north of Songpan and the south of Dujiangyan was the territory of the Han people, while in between these two areas Qiang culture was prevalent (H. Liu, 2011, p. 24). When the Foshan Assistance Group proposed the goal of a “West Qiang cultural town” for Shuimo and to promote the Qiang minority culture instead of Tibetan culture, however, the proposal received extensive opposition from local government officials and professional experts (P. Xu et al., 2014, p. 440), and one reason from an expert in Qiang culture was that “the Tibetan population exceeds the Qiang population”. In addition, the national government provides subsidies for towns developing Tibetan culture (H. Liu, 2011, p. 30). Regarding this debate, I could find no information on the attitudes of local villagers, and in particular we do not know the opinions of the Qiang ethnic group.

Hongbao Liu then talked to several groups of stakeholders—local government officials, local residents, cultural experts, and members of the Foshan Assistance Group—and expressed his own reasons for their Qiang-style town proposal: First, Wenchuan County is located in the area historically settled by the Qiang and had unique ancient traditions despite the low proportion of Qiang population (only 4.19 percent); second, for tourists, Shuimo would not be as attractive as Tibet for Tibetan cultural tours; third, all the other 12 towns in Wenchuan County except Shuimo had chosen to develop tourism based on Tibetan culture and other cultures, making Shuimo’s choice of Qiang culture unique. These arguments, according to Hongbao Liu’s own narrative, successfully convinced the stakeholders and ultimately got their approval on the proposal (Chen & Yin, 2010, p. 30).

4.1.2 Planning Procedure

One of the unique features during the formal recovery in Shuimo, compared to many other localities, was the bidding process during the re-planning procedure. But how this process was determined and who made this decision?

According to Hongbao Liu, it was Keshi Chen who made the suggestion of one master designer from one planning and design institute or a consortium taking responsibility for the whole planning package, from the comprehensive plan to the architectural design (H. Liu, 2011, pp. 36-37). Keshi Chen observed that there were a number of urban design institutes working in the quake-affected area. Their practices varied a lot from each other, but none of the designs for the new towns followed a unified style. His reason for the suggestion was that, just like one chef rather than a dozen cooks serving one table, one designer would ensure a unified style in a town, which would be the only way to build a town as beautiful as the successful cases internationally⁶⁹ (Chen & Yin, 2010, p. 9; H. Liu, 2011, p. 37).

This proposal was then endorsed by the Secretary Shufeng Chen from the Foshan Assistance Group, who suggested that this idea be implemented in the tender documents for the “Shuimo conceptual urban design bidding”, which meant the winner of the bid should be responsible for both the township planning and detailed architectural design (Chen & Yin, 2010, p. 9; H. Liu, 2011, p. 37). “Cooperation with one design agency will reduce remarkable communication costs for the Foshan Assistance Group”, he said (Chen & Yin, 2010, p. 9). Opportunity and risk co-exist, however. Implementing the “one designer” policy was like putting all the eggs in one single basket (H. Liu, 2011, p. 37). In order to minimize the risk of relying only on key decision makers⁷⁰, Hongbao Liu decided to jump out of the routine procedures of making plans and designs by the Foshan Academy of Urban Planning and Design and host a bid (H. Liu, 2011, p. 37). Keshi Chen also needed to participate in the competition to bid for the authority to design.

By now, we can see that the planning procedure was mainly determined by the Foshan

⁶⁹ For example, the mountainous town in Switzerland and the ecological town in Japan, as Keshi Chen pointed out as urban design models applicable in Shuimo.

⁷⁰ Here referring to Keshi Chen, Hongbao Liu, and Shufeng Chen in particular.

Assistance Group, while some details might have come from other professionals or outsiders, such as the leading designer who later won the bid. Since the bid winner was decided by votes of the local officials and experts and professionals but not by the Foshan Assistance Group, it was a relatively fair planning procedure and it politically protected both the Foshan Assistance Group and Keshi Chen's design team from the misunderstanding of potential corruption. The only participant missing from the selection process was the more general public opinion from the local villagers.

4.1.3 Supporting Private Enterprises

The Foshan Assistance Group members came from Guangdong Province, the wealthiest region in China, the economy of which was based on private companies. They brought their approach to Shuimo and paid more attention to private enterprises than the local government officials did.

Hongbao Liu visited a number of agricultural production bases, including the Shuimo Tea Plant, upon his arrival in 2008. After careful consideration, the Foshan Assistance Group decided to support the local tea industry and other eco-industries. However, this idea was opposed by some department heads in the township and county government units, who believed that “the tea factories were mostly private enterprises”, and “since the financial policy for private enterprises is not clear enough, it is not necessary to spend the money on these enterprises” (H. Liu, 2011, p. 92).

However, Hongbao Liu had his own judgment and calculation. For example, the production base of Aba Jiuzhai Tea Co. in Shuimo was at the foot of the Qianlong Panlong Temple Hill, where three villages (Huangjiaping, Dayandong, and Niutanggou) in Shuimo were located (H. Liu, 2011, p. 92). More than 1,000 households in the three villages used to depend on the 3,000 mu (approx. 494 US acres) of tea trees to live, and the annual output value reached 20 million yuan (approx. 2.9 million US dollars) before the earthquake (H. Liu, 2011, pp. 92-93). During the quake, however, the tea plant on the mountain collapsed and villagers failed to take care of the tea trees when they were struggling to survive themselves. Moreover, the sales company located in Yingxiu Town was totally destroyed and thus the sales network was swept away. In this sense, the villagers’ economic loss of tea production exceeded 20 million yuan (approx. 2.9 million US dollars) (H. Liu, 2011, p. 92).

Hongbao Liu, together with the leaders of the Aba Qiang Ya⁷¹ industrial base, studied carefully the post-disaster recovery regulations by the State Council, and found that supporting industrial recovery was on the agenda on the State Overall Plan. Moreover, the state regulations did not require that such support be given to only state-owned enterprises and not to private companies (H. Liu, 2011, p. 93). In other words, supporting private enterprises was permitted by the state policies. Hongbao Liu then displayed his calculation on the potential increase of annual revenue

⁷¹ This is a brand of a Qiang-style tea plant belonging to the Aba Jiuzhai Tea Co.

(3~5 million yuan) and per capita income (3000 yuan). He also proposed a detailed plan for supporting the tea industry, which convinced both the local governments and the Guangdong Provincial Assistance Group (H. Liu, 2011, p. 93).

Foshan provided 3.5 million yuan (approx. 0.51 million US dollars) out of the total 6 million yuan (approx. 0.88 million US dollars) financial support for the recovery of the Aba Jiuzhai Tea Co. (H. Liu, 2011, p. 93). The number of production lines after the construction increased to six, which doubled from the pre-quake three. On April 20, 2009, new equipment was installed and normal production was resumed in May. Furthermore, the Foshan Assistance Group also established a new business model of “Company-Base-Household”: the company offers technical instructions on tea planting and harvesting; farmers send their tea buds to the Shuimo Tea Plant; and then the processing is conducted by tea specialists rather than individual farmers. With this more specialized division, the tea farmers could earn as much as 2,000 yuan per mu (approx. 1785 US dollars per US acre) per year from tea planting, which has become the major source of income for many local villagers (H. Liu, 2011, p. 93).

The productivity of the local tea plant, under the support from the Foshan Assistance Group, now exceeds three times the pre-quake productivity. This phenomenon has also changed the attitudes of the Wenchuan County and Aba governments. As a consequence, local government invested another 10 million yuan (approx. 1.47 million US dollars) in expanding the tea production scale, and the previous Aba Jiuzhai Tea Co. changed its name to “Wenchuan Qiang Ya” and registered their own brand. Now, many of the villagers in Huangjiaping, Dayandong and Niutanggou have signed cooperation agreements with the Tea Plant (H. Liu, 2011, p. 94). Local residents followed the trend and further extended the industrial chains to “Tea House Tourism”, taking full use of the high-quality landscape resources (H. Liu, 2011, p. 93). Thereby we can see how local knowledge was shared through the counterpart assistance group. When the Foshan Assistance Group persisted with their initial judgment, the local people, both government officials and villagers, learned from their experiments and gradually changed their attitudes. In this sense, the decisions and actions of the insiders were influenced by the outsiders, here represented by the Foshan Assistance Group.

4.1.4 Landscape Aesthetics versus Security from Hazards

If we treat the three examples above as decision making dominated by outsiders, then the next two stories will reveal the conflicts between different groups of outsiders, each with their own knowledge and expertise, or between different reconstruction projects, each under its own strict time constraint. From the implementation of the Shouxi Lake Project, we can see the basic controversies between engineers and designers, and the role of the Foshan Assistance Group in communication and coordination between them.

For thousands of years, there had been only one small river through Shuimo, named the Shouxi River. Differing from the abandoned initial recovery plan, Keshi Chen's design was characterized as "One Lake, Two Shores and Four Zones", with an 80,000 square meter (861,120 square feet) artificial lake (Shouxi Lake) as the biggest innovation (H. Liu, 2011, p. 111; P. Xu et al., 2014, p. 438). The lake would be made by widening the river and building new dams. However, the riverbed of the Shouxi River in Shuimo was a slope with a 25 meter gap in height: the upper elevation at the Sanshui Bridge was 928 meters while the lower elevation at the Shuimo Bridge was only 903 meters. In order to form a flat surface, the higher side needed to be excavated (H. Liu, 2011, p. 111).

In May 2009, The Sichuan Provincial Ministry of Water Resources Exploration and Design Institute of Water Conservancy examined the feasibility of this design and pointed out three vulnerabilities: First, the 8 meter depth of the center of the lake would be a potential risk for the residential recreation activities and would make salvage difficult if a child accidentally fell into the lake; Second, rivers in the mountainous area usually contain a high proportion of silt, so the river sediment would gradually fill the entire lake; Third, a new dam would mean that the water should be released before the flood arrived, in which case the overall landscape would be destroyed, or submerged under water in seconds (H. Liu, 2011, p. 112). Keshi Chen believed that the three potential risks could be avoided at technical levels, and he proposed two options: a hanger dam, or a hydraulic gate. Unfortunately, both alternatives were rejected due to their high maintenance costs that would lay fiscal pressures on the Shuimo Government (H. Liu, 2011, p. 112).

The Water Conservancy Department laid more emphasis on practicality, functionality, and flood

control requirements, while Keshi Chen's team were more focused on visual effects and landscapes. Neither of the two sides would compromise (H. Liu, 2011, p. 112). The original schedule for the Shouxi Lake Project was "to bid in June, to invite the construction company and start comprehensive construction in August", but the preliminary debate had taken too much time and thus there would be a risk of delays (H. Liu, 2011, p. 113). The Foshan Assistance Group, holding the largest responsibility for any delay, was under great time pressure, but the group members had to maintain a communicative atmosphere between the designers and water conservancy experts in order to make the project work.

Keshi Chen proposed another amendment to the proposal on June 14, 2009, but once again it was rejected by the water conservancy experts as lacking necessary flood control considerations. He started to consider an alternative suggested by one of his assistants, Jie Yin, that there was no need to commit to a large lake. Instead, a smaller inner lake would work the same way and it would be simple and feasible to separate the Shouxi River into two parts: the inside Shouxi Lake and the outside Shouxi River (H. Liu, 2011, p. 114).

This proposal won the support of both the designing group and the water conservancy experts, and the next question was, would this project be secure after implementation? Hongbao Liu asked Jun Li of the Foshan Assistance Group to provide solid proof for the security of this alternative. After a number of visits, Jun Li persuaded the head of the State Key Laboratory of Hydraulics and Mountain River Engineering at Sichuan University to conduct the modeling experiment in one month. The normal task of the Laboratory was to verify the reasonableness and safety of large-scale water conservancy projects (like Gezhouba) and the normal cycle was three months. But Jun Li managed to convince its head to agree to help and compress the time required to one month. The test results turned out to be satisfactory, and the experts also recommended some feasible engineering solutions based on their 1:40 scale models (H. Liu, 2011, p. 115).

4.1.5 Coordination among Simultaneous Construction

Another unique character of the post-disaster reconstruction process is the simultaneous construction, compared to the normal process of building one project at a time, such as housing, pipelines, road, and bridges. At the peak time of reconstruction in Shuimo, 29 large-scale counterpart assisted projects in housing, health center, education, roads, bridges, pipeline, and landscape were launched at the same time, with more than 500 large automobiles, over 300 pieces of construction equipment and 10,000 workers gathering in the 1.95 square kilometers (482 US acres) of the Center Village (H. Liu, 2011, p. 174; Zhongguo Gongcheng Zixun Xiehui, 2012). How to coordinate between the tight timelines of different projects was a big issue in the implementation process and was essential in the overall efficiency. In Shuimo, construction teams (leaders of each team, in particular) had the authorities to negotiate with each other, set priorities accordingly, and to coordinate with other projects.

One of the most challenging projects was the road construction: once the road was under construction, other projects would not be able to transport their materials to meet their own strict schedules. This conflict became an unavoidable problem for Xieqin Huang, the leader of the road construction team (H. Liu, 2011, p. 128). His approach was to communicate the road construction schedule with the other construction teams. Sometimes other teams would have urgent transporting tasks of building materials. In this case, the road construction team had to suspend their own work and started over afterward (H. Liu, 2011, p. 129). Given the limited roads available, it was inevitable for the heavy construction vehicles to crush the half-done roads, and in such circumstances, the road construction project had to rework, adding to the additional costs. An extreme case was the urgent request from the Qiang Town construction team on the completion of part of the Shuimo Avenue along the Shouxi River. To avoid repeated work on the same road, Xieqin Huang decided to first provide the roadbed for the Qiang Town team to use, which cost less to fix once crushed by the heavy machinery. Only after all the major structures in Qiang Town were completed did Xieqin Huang allow the construction team to cover concrete on the roadbed (H. Liu, 2011, p. 129). Another difficult case was the slope from West Qiang Hui to the Chanshou Old Street, which was the only way for the construction vehicles for the Wenchuan Bayi Primary School to pass. However, there were a couple of residential houses not yet torn down and the road construction team could not start working on it. Xieqin Huang, under this case,

had to request the Shuimo township government to conduct the relocation (H. Liu, 2011, p. 129).

From a larger perspective, since all the towns in Wenchuan County were under reconstruction at the same time, the basic building materials—sand, stones, cement, and other raw materials—were all in short supply in the surrounding area and the prices soared quickly (H. Liu, 2011, pp. 78, 116). Thus many construction teams had to purchase materials from outside. For instance, the Shouxi Lake Construction Team and the Guangdong Southern Construction Engineering Company decided to procure from suppliers in Dujiangyan and they dedicated staff to assist the local police to divert traffic jams. In many cases, many raw materials for the Shouxi Lake Project could only be transported at night to mitigate the impacts on other projects (H. Liu, 2011, p. 116). For the Shuimo Middle School construction team, the majority of materials (particularly the high-quality steel) could not be produced locally and had to be transported from Dujiangyan through the National Highway G213. More than once, the concrete trucks were blocked for hours in the traffic jams, when the construction had gone to a critical moment: the concrete, if not cast in time, would possibly cause future leakage. Again and again, the team members had to ask the highway traffic officers for help (H. Liu, 2011, p. 78).

Therefore, simultaneous construction in the post-disaster recovery required coordination and collaboration. Each decision and action by the Foshan Assistance Group and the construction companies would affect consequent conditions and all the decision chains thereafter.

Spontaneous cooperation and coordination were the key to the overall completion of the physical reconstruction in Shuimo.

4.2 Who Has the Power to Speak?

From the examples in Section 4.1, we can identify that those who have power to speak during the recovery planning process were mostly the outsiders: the Counterpart Assistance Group and technical support (geologists, designers, planners, water conservancy experts, etc.). The initial contents and work plan of the counterpart assistance were determined by the Foshan and Guangdong Assistance Groups together (H. Liu, 2011, p. 31). The goals of Shuimo were first proposed by the Foshan Assistance Group (H. Liu, 2011, p. 32). Technical specialists were dominant in the security argument over the Shouxi River Landscape Project. And innovations in the planning process and adopting the Qiang style came from Hongbao Liu's personal networking of outside expertise.

There are exceptions, however. When Daijun Li, the Deputy Director of the Wenchuan County People's Congress Committee was visiting Shuimo in January 2009, he suggested to build a lake house or a tower at a specific spot in Southeast Shuimo given the 20 meter vertical gap from the Shouxi River (H. Liu, 2011, p. 40). And it was ultimately adopted and applied in the actual reconstruction. In this case, the deputy Director was a local government official, but it did not necessarily mean that he had deep local knowledge. His suggestion was definitely not based on the perspective of villagers, and his knowledge was based on only one visit to the site. Furthermore, by making the suggestion, he transferred the responsibility to the Foshan Assistance Group to finalize the decision.

Local residents, although initiating their own informal recovery processes from time to time, had very few opportunities to express their disagreements with the formal government-led reconstruction, except for the implementation of residential resettlement. We will discuss this in Section 4.3. Objections from the local governments (of Wenchuan County and Shuimo) were heard by the outsiders, but given their limited knowledge in planning and development theories, local officials were usually persuaded by the outsiders (Also refer to Section 4.3). In this sense, there was little difference in the roles of local villagers and local government officials, in that neither had significant influence over the reconstruction planning decisions.

The case of the relocation of the polluting factories illustrates this process. Because of limited

funds, the Foshan Assistance Group needed to convince the Secretary of the Aba People's Committee (H. Liu, 2011, p. 50) to pay for it, and they relied on him to convince others. Yet there was another player hidden in the whole process: the Central Government. In the case of relocating industries, by the time the Aba People's Committee agreed to assist the process, the Central Government had already released the overall recovery plan indicating that the Industrial Park in Shuimo was to be merged or relocated (State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction, 2008, p. 91). Therefore, it was incomplete to conclude that the counterpart assistance groups had more power to speak during the local decision making process. A more appropriate conclusion should be, "local governments lost their voice" partially due to the administrative hierarchy of the counterpart assistance program, in which provincial governments naturally had more power than municipal and township governments (J. Xu & Lu, 2013, p. 89), and thus Similarly, the status of governments from counterpart assistance cities and local townships was unequal from the beginning.

4.3 What If People Do Not Agree?

Another source of authority for the outsiders was the resources and capital behind them. The Foshan Assistance Group had both years of experience and considerable funds. Even when the local people disagreed with their informed opinions, they would use their capital to construct convincing arguments and persuade the local groups.

One example was the consensus building of developing tourism as described previously. To obtain agreement from the local people on the Chanshou Old Street, the Foshan Assistance Group organized two trips to other tourism towns, including Lijiang⁷² in Yunnan Province and Luodai Ancient Town near Chengdu. Since visiting Lijiang did not belong to responsibilities of counterpart assistance, the Foshan Assistance Group could not use the special funds. As a result, they could only support a couple of local officials within the Group's limited budget. These small group of men were impressed, but many of the women in Shuimo still did not agree. Once again, the Foshan Assistance Group used their own money to organize another trip to the nearer Luodai Ancient Town in Chengdu, inviting one representative from each household on the Chanshou Old Street. More than 150 villagers were involved in this second visit, during which they agreed to formulate a similar vision for the future of Shuimo (H. Liu, 2011, pp. 61, 173; P. Xu et al., 2014, p. 439).

Another source of disagreement came from the actual relocation process. In some circumstances, local residents displayed full understanding and support. For example, during the construction of the Shuimo Middle School, there were 37 households relocated and they had to live on a temporary open space. They were willing to suffer the difficulties as long as their children would have better educational opportunities in the future (W. Li, 2009). In this case, the relocation of farmers, land acquisition, and site clearance work proceeded smoothly and were all completed by February 25, 2009 (W. Wang & Song, 2009). But in most other cases, the reconstruction was not smoothly implemented when residential relocation was required. The statistics summarizing the land acquisition process claim there were no complaints and no petitions, but this does not mean that the process was harmonious. Take the Chanshou Old Street Project as an example. This

⁷² Lijiang was successfully reconstructed into a tourist destination after a 7.0-magnitude earthquake in 1996 (P. Xu et al., 2014, p. 439).

project was a rural housing reconstruction project, and did not fall into the scope of counterpart assistance. In other words, the Foshan Assistance Group could only build the street itself, but needed the signature of all householders so that the construction team could enter the site. The initial oral agreement of the residents on the Chanshou Old Street Project did not constitute a commitment or contract. When the Foshan Assistance Group started implementation of the plan, the residents changed their minds: on the one hand, they did not want to move back to tents or temporary housing again; and on the other, they were not willing to give up several layers to accord with the new plan, which required all buildings along the Chanshou Old Street to be two to three stories⁷³ (H. Liu, 2011, p. 60).

The Foshan Assistance Group collaborated with local government officials and local Communist Party members. The Shuimo Township Government established an Old Street Relocation Headquarters, with Jihua Luo acting as the commander and Shufeng Chen as the Deputy Commander. They first met with village leaders and investigated why some residents refused to sign the agreement and what were the possible solutions. They also assigned each of the more than 20 Communist Party members living on the Old Street to persuade seven households to support the plan (H. Liu, 2011, p. 60).

The process proceeded slowly, however. One of the households holding the strongest opposition was the parents of Pingliang Yu, the Village Secretary who visited Lijiang and supported the Old Street Project thereafter. After several failed attempts to convince his parents, Pingliang Yu had no alternative but to coax them out of the house and let the construction team tear down the two-story newly built house with excavators (H. Liu, 2011, p. 61). After this turning point, residents on the street gradually signed the agreement.

The outcome we observed was that agreement was achieved, but to what degree the local residents were “willing” to be resettled is unknown to us. In other words, when some people were persuaded, convinced or coaxed to be resettled, could it be called consensus? The question was

⁷³ Because there was no plan and few regulations on the residential buildings in Shuimo before the earthquake, many of the local residents built their residences into four or five stories, or even more. In the recovery plan for Shuimo, however, the height and number of stories were under strict control, and in some cases the residences were limited to lower than three stories. When fewer stories of residences meant smaller building areas in total for households, the residents would not be happy about it.

even harder to answer when the local villagers were divided into opposite positions after the two visits, resulting in different opinions within households. The disagreement between insiders and outsiders thereby was transformed into pure disagreement within the insiders. All of these were based on the knowledge and experience of the outsiders. Hongbao Liu understood the significance of sustainable development in the long-term and transformation from energy-consuming industries to service industries was a necessity. Members of the Foshan Assistance Group agreed that developing tourism was a better choice than reconstructing the industries for Shuimo; and they were aware of successful cases and what they needed to do in order to achieve similar outcomes. This type of knowledge belongs to the urban planning realm, and thus one lesson we should learn here is that planners have the power of knowledge and expertise to persuade stakeholders beyond the authorities empowered by any government body, organization, or political and administrative system. We should use the power carefully, though.

4.4 Public Participation and Opinions

Despite the tight schedule of the post-disaster recovery tasks, there was some public participation during the process, although mostly through informal and passive processes. For instance, when the Foshan Assistance Group first arrived at Shuimo, they talked to a number of local residents there during the comprehensive investigation. In setting the goals of developing tourism, the residents' initial opposition was received by the Foshan Assistance Group. Moreover, the Abo Normal College selected five plan proposals among all the plans assembled nationwide in March, 2009, and they sought students' opinions on March 11 before the expert review on March 12 (S. Zhang, 2009).

But as we can see from the relocation story in Section 4.3, it was not easy to evaluate the extent and outcome of public participation because: (1) The role of an individual was usually difficult to define given the complex network in Shuimo, where most of the local residents have family members or relatives working in the local government (H. Liu, 2011, p. 60). Therefore, it was hard to say whether this was the participation of the "public", or the participation of some local government officials as representative of the general "public", or both. (2) How the public opinions were reflected and addressed in the final plan remain unknown for us, and even the same person might hold different positions towards the same plan in the different stages during the construction process. In this sense, simply looking at the recovery consequence or any survey among villagers is not enough to reach a conclusion.

Another paradox regarding public participation is that, planners as experts want to help the localities to have the most beautiful landscape and the cleanest living environment, while in the values of the local residents, convenience is paramount. Here is one example of contradictory opinions among the Foshan Assistance Group and the local residents, and I will end this chapter with a few quotes translated from a Chinese article (H. Li et al., 2011).

"Landscape construction" (Fengmao Jianshe) was a term used frequently in the post-disaster recovery process in Wenchuan County, either in documents or in the oral communication among government officials. It refers to the attention of government to the physical environment, including space layout, community tidiness and cleanness, and building appearance (H. Li et al.,

2011, pp. 60-61). From June through September in 2009, the Shuimo Township Government started a landscape regeneration process involving several hundred houses along the Xuankou-Sanjiang Highway and in Xianfengyan Village (H. Liu, 2011). The intention was to improve the living conditions in the affected area, which would be good for residents. But it also required fast building speed and the emphasis on expedient physical construction rather than incorporation of traditional features (H. Li et al., 2011, p. 61). Thus later, the local residents called it “Storm of Remediation”(Gao Fengbao, or, Zheng Fengbao), which reflected an ironic tone towards this kind of government dominant action concentrated on political achievements rather than the real needs of local villagers (H. Li et al., 2011, p. 60). The following comments came from villagers in the Xianfengyan Village in Shuimo, a village planned to be oriented to tourism (H. Li et al., 2011, p. 61):

Q1: What is “Zheng Fengbao”?

A1 (Case 449): (They) built the cement roads, tiled our houses, sealed another layer of wooden windows on our existing windows, and painted red. (They also) used bluestone outside the door, built a flowerbed, and required us to plant flowers. (But) we grow vegetables.

A2 (Case 537): To make changes to the houses, tearing down the fences and adding wooden windows.

A3 (Case 538): Toilets and pigpens were prohibited. We used to have a toilet just on the road, and now it is built on the hill. How far it is to go there!

Q2: Was it fast?

A2 (Case 449): Quite fast.

A2 (Case 537): Yes, really fast.

A2 (Case 538): Yes, almost immediately.

Q3: Are you used to it?

A3 (Case 449, Case 537, Case 538): Not really. Nor do we like it (the new style). We like our previous one.

CHAPTER 5 SPEED VERSUS QUALITY: IDENTIFYING KEY FACTORS

The reconstruction projects were implemented under a considerably fast speed. For instance, reconstruction and renovation of the residences on the Chanshou Old Street started on February 14, 2009, and was completed before the first anniversary of the Wenchuan Earthquake (May 12, 2009), together with the Guojiaba Qiaoxinju Project and the main building of the Shuimo Middle School (W. Li, 2009). By the end of 2009, 80 percent of the total construction volume assisted by Foshan was completed (Jing & Yang, 2009; Yin & Fu, 2009). By March 31, 2010, Foshan had invested 0.92 billion yuan (approx. 0.14 billion US dollars, 85.9 percent of the total planned investment), and all construction was completed in one-and-a-half years instead of the three-year time requirement by the national government (X. Liu & Xu, 2010).

How was the plan implemented in such a short time? And what are the factors influencing both speed and quality in the recovery process? This chapter attempts to address these two questions, mainly based on the analysis of roles, intentions and incentives of the various participants involved in the formal process⁷⁴.

⁷⁴ The role of individual residents has been touched on in Section 3.3.2 and Chapter 4, and is not the focus of this chapter due to their limited involvement in the formal recovery processes.

5.1 Capital Input

Capital input was the primary initial issue in the plan implementation, especially with the simultaneous recovery processes occurring in the whole region. Based on the requirement of no less than one percent of previous year's revenue, Foshan initially committed a recovery fund of 640 million yuan (approx. 94 million US dollars)⁷⁵, the equivalent of 60 years of local revenue in Shuimo (H. Liu, 2011, p. 33). From 2008 to 2009, however, prices for building materials increased by more than 60 percent, and labor costs rose more than 80 percent, resulting in a much higher actual investment needed than when those projects were approved (Jing & Yang, 2009). The Foshan Assistance Group therefore soon found that the 640 million yuan was far from enough (P. Xu et al., 2014, p. 437). Meanwhile, Shuimo remained unknown at the start of recovery, located on the ending point of the Xuankou-Sanjiang Highway. It had neither geographical advantages nor media advantages to attract adequate additional funding (H. Liu, 2011, p. 48). However, the Foshan Assistance Group managed to survive these difficulties through a series of strategies.

The Foshan Assistance Group first convinced the Secretary of Aba Prefecture in October 2008 to take responsibility for relocation of existing factories at a cost to the Aba Prefecture Government. By the estimation of the Foshan Assistance Group, the relocation would cost at least 700~800 million yuan (approx. 103~118 million US dollars), while the actual cost turned out to be almost one billion yuan (approx. 147 million US dollars) (H. Liu, 2011, p. 50).

Another strategy of the Foshan Assistance Group was to win the support of Guangdong Province after they found that the Guangdong Provincial Assistance Group had set up a separate fund for the reconstruction in Wenchuan County (H. Liu, 2011, p. 49). Yingxiu and Weizhou were two key townships in the Guangdong CounterAssistance work at the beginning, and what the Foshan Assistance Group wanted was to adding Shuimo as a third one. At the end of 2008, under Hongbao Liu's invitation, the annual summary conference of the Guangdong Counterpart Assistance was organized by the Foshan Assistance Group in Dujiangyan, during which Hongbao

⁷⁵ Another version of the initial funding was 690 million yuan (approx. 101 million US dollars) (Z. Tang & Zhang, 2010, p. 1213). Based on my judgment, this number might have taken into account some projects approved by the Foshan Municipal Government.

Liu illustrated the Shuimo recovery plan to the provincial and municipal leaders in detail (H. Liu, 2011, p. 49). Soon after the conference, the Shuimo recovery plan won a series of awards in March 2009, and Shuimo was listed as the third key township of the Guangdong Assistance Group, as confirmed in the speech of the Guangdong Provincial President Huahua Huang. Ultimately, all the 78 projects the Foshan Assistance Group proposed were later approved by the Guangdong Assistance Group, converted from the plan to construction projects. Through all these processes and efforts, the Foshan Assistance Group obtained more than 200 million yuan (approx. 29.4 million US dollars) of support from Guangdong Province (H. Liu, 2011, p. 49).

The school and colleges in Shuimo also attracted external funding in the reconstruction. For example, the Government of the Hong Kong Special Administrative Region helped to fund the Shuimo Middle School reconstruction. The Second Artillery Force of the People's Liberation Army assisted the construction of Bayi Primary School, the funding for which included 2.53 million yuan (0.37 million US dollars) from the Foshan Women's Association (Foshan Assistance Group, 2010, p. 90; H. Liu, 2011, p. 50). Moreover, the relocation of Aba Normal College brought in more than one billion yuan (approx. 147 million US dollars) of funds from the Central Government (H. Liu, 2011, p. 53).

In addition, the Foshan Assistance Group also tried every effort to access publicly donated funds. For instance, the Foshan General Chamber of Commerce in Hong Kong raised 400,000 yuan (approx. 59,000 US dollars) for the Qiaoxinju housing project (H. Liu, 2011, p. 49). The Foreign and Overseas Chinese Affairs Bureau of Foshan Municipality donated 1.69 million yuan (approx. 0.25 million US dollars) for the construction of rural housing and water supply (Foshan Assistance Group, 2010, p. 91). The Foshan Municipal Government invested an additional 4 million yuan (approx. 0.59 million US dollars) to renovate the landscape of 123 residential dwellings and the village center in Guojiaba Village (H. Liu, 2011, p. 49). In this way, the donations from all entities in Foshan reached more than 200 million yuan (approx. 29.4 million US dollars), and thereby the overall financial input from Foshan amounted to 1.07 billion yuan (approx. 0.16 million US dollars), which equaled 1.68 times of one percent of Foshan's three-year revenue, and the Foshan Assistance Group collected a total capital of nearly 3 billion yuan for the single town of Shuimo (Jing & Yang, 2009; O. Liu, 2011, p. 50; X. Liu & Xu, 2010).

5.2 Intentions and Roles of Different Government Bodies

Because of the emergence of the counterpart assistance system, a number of government units were involved in the local reconstruction process. To better understand how the rapid formal recovery process came into existence, it is essential to first understand the intentions and roles of each relevant government unit as well as their policies.

5.2.1 The Central Government

The Central Government reacted rapidly after the Wenchuan Earthquake, providing both national policies and fiscal budget as sources for local governments in post-disaster recovery to refer to. Their quick reactions had a couple of reasons given the specific timing and social conditions, as have been discussed in Section 1.2.2.

Therefore, state policies played a role of guide to the local recovery, requiring all provincial governments and local government bodies to follow the guidance. The SOP-PWERR, for example, laid the foundation for many strategies and action later taken by the provincial governments and other local governments: Yang Wang, Secretary of Guangdong Provincial Party, proposed to plan ahead before any reconstruction, following the emphasis on mandatory plans in the state plan (H. Liu, 2011, p. 20). Qibao Liu⁷⁶, the Sichuan Provincial Party Secretary, proposed the fundamental instructions for personnel, but they were based on the principles set up by Jintao Hu, the CPC Central Committee General Secretary, to direct all government officials to take into consideration the comprehensive needs of the disaster affected area (H. Liu, 2011, pp. 19-20). The Foshan Assistance Group, in this case study, is another example, and we can see through Liu's book that before they finalized any decision, they would go back to the state plan to ensure that their next steps aligned with the state policies, especially when disagreement appeared. Such cases include the state's emphasis on sustainability as well as local and minority cultures, which provided the basis for the Foshan Assistance Group to persuade the local people to accept the goals of a new ecological town with Qiang ethnic features (H. Liu, 2011, pp. 19-20, 25), as well as the industrial relocation (Z. Tang & Zhang, 2010, p. 1213).

⁷⁶ The first character of the given name of this official has two pronunciations in Chinese: "Qi" and "Ji". I assume that his name is Qibao Liu instead of Jibao Liu.

From the recovery outcome in Shuimo, we can identify some positive results of the state policies: improving public facilities, encouraging industrial transformation, and enhancing sustainable development. All these can be seen as one of the advantages of the political system in China, with a strong central government (H. Liu, 2011, p. 152). But the other side of the sword was the vagueness of statements in the state plan, such as the standards to determine which houses should be rebuilt and which should be reinforced only (Ministry of Housing and Urban-Rural Development (MOHURD), Ministry of Civil Affairs, The People's Government of Sichuan Province, The People's Government of Gansu Province, & The People's Government of Shaanxi Province, 2009, p. 77). The state policies did not address these technical details, leaving the potential for conflict at the local level in the implementation process.

5.2.2 Sichuan Provincial Government and Local Governments

Following the state policies, Sichuan Province also issued a series of official documents identifying the responsibilities of the counterpart assisting groups (H. Liu, 2011, p. 6).

Advantages of Sichuan Province included an abundant and cheap labor supply and the low cost of land. The most urgent post-quake reality for the whole province was to maintain the normal lives and livelihoods of the people in the affected area (C. Guo, 2008, p. 17). Local governments shared this incentive with the Provincial Government, and thus they simply wanted a fast reconstruction, resisting any long-term planning considerations. When the Foshan Assistance Group took several months making “useless” plans, these local government officials were angry at their counterpart assistance group and urged them to start the construction immediately.

As for the industrial relocation in Shuimo, financial revenue was one issue to consider. But the Shuimo Township Government did not have any desire to retain the local plants, because the township did not financially benefit from the industries before the earthquake owing to the fiscal system. For the Aba Government, they had to follow the state plan of industrial mergers. Their reconstruction costs and tax revenues would be the same, no matter where the industries relocated as long as they would still be in Aba. Unfortunately, I have not yet investigated where all the previous factories in Shuimo have moved⁷⁷.

⁷⁷ My own suspect is that the industries remain in Aba, but I have not been able to justify my guess.

5.2.3 Guangdong Provincial Government

The People's Government of Guangdong Province was among the first government bodies to implement the counterpart assistance program. By the end of July 2008, the Guangdong Provincial Government had assigned the specific pair assistance groups (H. Zhang, 2008), and also announced a series of requirements for all municipal assistance groups and identified the priorities to meet the needs for housing, infrastructure, and other public services. They urged the municipal assistance groups to take an appropriate role, neither to substitute for the local governments nor to avoid completing their reconstruction obligations. In addition, they emphasized not to compete with each other during the post-quake recovery process, and to achieve the best instead of the fastest (H. Liu, 2011, p. 20; H. Zhang, 2008). Despite all these official policies, the municipal assistance groups acted under both peer pressures and strict timing requirements. For example, all the groups assisting Wenchuan County received a notice by the Spring Festival in 2009 that school reconstruction must be completed by September 1, 2009: Political leaders in Guangdong Province would hold the project transferring ceremony at that time, and whichever municipality could not meet the deadline would be ashamed and despised, as “a duck in a group of swans” (H. Liu, 2011, p. 78).

In fact, the provincial governments that participated in the NCA also experienced great peer pressure and had to compete with each other to achieve the recovery goals set by the Central Government, just as the municipalities did. Political leaders of the provincial governments being selected in the NCA felt honored to be part of the system, and wanted to achieve the best results available for the sake of future careers as well as regional policies for their provinces. This became the main source of incentive for the Guangdong Provincial Government to pass down the counterpart assistance policy to its 13 municipalities in the short term. In the long term, however, they also had the incentive to do the best they could for their own sake, given the export-oriented economies of Guangdong and the financial crisis starting right before the Wenchuan Earthquake. In this sense, the basic needs of 45 million victims during the earthquake provided an opportunity for Guangdong Province, one of the wealthiest provinces in China, to transform its industrial orientation from global trade into the domestic market (C. Guo, 2008, p. 19). This helps explain why a large proportion of construction projects initiated by the municipal

assistance groups from Guangdong were constructed by Guangdong companies⁷⁸. The counterpart assistance program provided a bridge to transfer the government investment into Guangdong enterprises and thus trigger a new cycle of economic development.

The signal of a long-term bond between Guangdong and Sichuan Provinces started to show up halfway through the recovery process, when Guangdong Province did more than what the Central Government had required them to do. In July 2009, Guangdong Province invested 400 million yuan (approx. 58.8 million US dollars) and established a Guangdong-Wenchuan Industrial Park in Wenchuan County to support industrial transfer from Southeast China ("Shuli Guoji He Guonei Liang Ge Dianfan: Guangdong Xieshou Wenchuan Jinru Hou Yuanjian Shidai," 2010, p. 15). Only seven months later, by April 2010, there were already eight enterprises from Sichuan, Guangdong, Hong Kong, and Taiwan settled in the Park, with a total investment of 2.3 billion yuan (approx. 0.34 billion US dollars) ("Shuli Guoji He Guonei Liang Ge Dianfan: Guangdong Xieshou Wenchuan Jinru Hou Yuanjian Shidai," 2010, p. 15). At the same time, Guangdong achieved a "Strategic Cooperation Agreement on Social and Economic Development" with Sichuan Province, and it also co-signed a "Long-term Cooperation Framework Agreement" with Wenchuan County to assist long-term development in Wenchuan following the reconstruction period ("Shuli Guoji He Guonei Liang Ge Dianfan: Guangdong Xieshou Wenchuan Jinru Hou Yuanjian Shidai," 2010, p. 15). Additionally, Sichuan and Guangdong also started a cooperation project to promote shared use of recreational cards among citizens and the development of complementary cultural assets in both provinces ("Shuli Guoji He Guonei Liang Ge Dianfan: Guangdong Xieshou Wenchuan Jinru Hou Yuanjian Shidai," 2010, p. 15).

⁷⁸ Construction companies for at least some projects were determined through open bidding processes, but I am not sure whether this was true for all the Foshan assisted projects. Neither do I know the participants in each bidding procedure. Despite these ambiguities, we have to admit that these companies from Guangdong Province did display professionalism, management, skills, and were more skillful in the bidding process. Appendix C.1 includes information about the construction companies for a few Foshan-assisted projects in Shuimo.

5.2.4 Foshan Municipal Government

Two weeks after the assignment of pair assistance, Ruilun Xian, the Deputy Mayor of Foshan, emphasized the importance of following the unified arrangements of the provincial government to prepare the overall plan for the Foshan-Shuimo counterpart assistance (Q. Zeng, 2008). The City of Foshan also established a couple of groups⁷⁹ cooperating with each other in the assistance process and clearly defined their scope of work: The Foshan Counterpart Assisting Shuimo Recovery Working Group (also known as the Foshan Working Group) was responsible for the making of a three-year pair assistance recovery plan and proposed suggestions for each time period. These suggestions should be reported to the Foshan Counterpart Assisting Shuimo Recovery Municipal Leading Group (also known as the Foshan Leading Group), and could only be implemented after being approved (Foshan Municipal People's Government, 2009). Under the Foshan Working Group there was a Counterpart Assisting Shuimo Reconstruction Management Center (also known as the Foshan Assistance Management Center) in charge of all the detailed implementation and management issues (Foshan Municipal People's Government, 2009).

The detailed policies of Foshan also identified three modes of assistance: Key projects would be built by Foshan on the behalf of Shuimo; other projects would be co-constructed by Foshan and the locality or self-constructed locally. For the assistance projects approved by the Guangdong Provincial Development and Reform Commission, the building mode would be determined by both the Foshan Working Group and local government (Foshan Municipal People's Government, 2009).

So the role of the Foshan Municipal Government was rather clear: to set up detailed rules and regulations for its Assistance Group. But what were its motivations? To answer this question, we should consider the position of the Foshan Assistance Group, as the representatives from Foshan in Shuimo. From the stories we have presented, it is not biased to say that the Foshan Assistance Group took the most responsibilities for the actual physical reconstruction in Shuimo. In fact, the Group was squeezed between two kinds of pressures: (1) the bottom-up pressures from the localities who wanted only rapid recovery; and (2) the pressures from the top-down recovery

⁷⁹ In other parts of this thesis, I do not differentiate the groups, but take them as a whole, referred to as the Foshan Assistance Group.

process, which can be observed as peer pressures. Peer pressures existed both between provinces and between municipalities. Foshan ranked second in budgeted revenue in 2007 among all the 13 municipalities in Guangdong Province assisting Sichuan (excluding Shenzhen, which was assigned to assist Gansu Province), and therefore the quality of the new Shuimo should also rank at least in second place, according to the logic of those individuals in the Foshan Assistance Group, especially for the Group leader, Hongbao Liu (H. Liu, 2011, p. 15). However, unlike Weizhou assisted by Guangzhou with 2.8 billion yuan (approx. 0.41 billion US dollars) of assistance fund, the Foshan Assistance Group initiated their work with only 640 million yuan (approx. 94 million US dollars). Unlike Yingxiu, the central town in the earthquake, Shuimo received little attention (H. Liu, 2011, p. 15). After the first seven months' non-action, the Foshan Assistance Group compared poorly to the near completion of the recovery of Sanjiang assisted by Huizhou (H. Liu, 2011, p. 173). All these realities added pressures to the leaders and members of the Foshan Assistance Group. Hongbao Liu frankly recorded in his book his doubt regarding his own career in the future if he and the Foshan Assistance Group failed to build an extraordinary new Shuimo (H. Liu, 2011, p. 15). So ultimately, the urgency of the recovery of Shuimo was transferred to individual officials from Foshan. Although the intentions of individual action might have originated in their concerns regarding their own careers, the pressures ultimately created positive incentives, and the overall outcome was that the Foshan Assistance Group successfully leveraged all its resources into a positive result.

5.3 Personnel

The significance of local leadership in post-disaster recovery has already been recognized by scholars (i.e., Olshansky et al., 2008, p. 281). But in a formal recovery process as in the PWERR, in which outsiders dominated both decision making and the actual reconstruction processes, what were their roles and functions? How did their expertise and personalities help accomplish their responsibilities? In this section, I will give a short summary of the composition of personnel from the formal recovery process in Shuimo, together with the assignment of their obligations, to help readers understand the role of the personnel from Foshan in influencing the speed and quality of post-disaster recovery.

5.3.1 Composition

Hongbao Liu was the Foshan Municipal Development and Reform Secretary when the Wenchuan Earthquake happened. He submitted a voluntary application soon after the Foshan-Shuimo counterpart assistance policies came out by the end of July, 2008. In August 2008, the Foshan Municipal Government appointed Hongbao Liu as the director of the Foshan Assistance Group⁸⁰, after a series of formal examinations, recommendations, and selections (H. Liu, 2011, pp. i, preface). We are not able to know what criteria the Foshan Municipal Government used to select this leader of the Foshan Assistance Group, yet from the counterpart assistance process and outcomes, we can see that Hongbao Liu revealed some significant leadership characteristics in the recovery of Shuimo.

In fact, the Foshan Assistance Group members all had strong areas of expertise. The director, Hongbao Liu, holding a bachelor's degree in physics and a doctoral degree in social sciences, had been working for years on industrial transformation and urban development strategies in Foshan before joining the Group. Other group members included: Xia Zhou, the deputy director of the Foshan City Planning Bureau; Pinchao Liang, the chief of the Foshan Fiscal Bureau; Shufeng Chen, a professional planner from the Public Affairs Management Bureau in Shunde District, Foshan (H. Liu, 2011, pp. i, preface). Jun Li, Guoping Liu, and Yujing Xian, three officials from

⁸⁰ To be specific, it was the Foshan Working Group. However, given the actual leading position in the counterpart assistance, there is no need to differentiate the two.

the Foshan Municipal Development and Reform Bureau, joined the Foshan Assistance Group on September 9, 2008 (H. Liu, 2011, p. 32). In addition, the Foshan Academy of Urban Planning and Design and the Foshan City Planning Bureau also sent their experts to Shuimo to assist the Foshan Assistance Group, creating a think tank of high intelligence and experience.

As a comparison, Shuimo as a small town in the western mountainous regions, did not have any professional planners or designers, and there was no vision for its future (H. Liu, 2011, p. 32). The local government officials and residents had few resources to apply to the recovery, and not knowing what to do and how to recover; they did not have any choice except for depending on the counterpart assistance from Foshan. And the lack of knowledge in urban development and planning sometimes further created a barrier for these local groups to understand the working approach of the Foshan Assistance Group (See their attitudes towards the planning efforts of the Assistance Group in Section 5.2.2).

Another important participant in the recovery of Shuimo was the urban design coalition, led by Keshi Chen. When Hongbao Liu was disappointed with the initial recovery plan and decided to abandon it, he contacted Keshi Chen through his own network to seek professional suggestions. Keshi Chen, who had previously designed another tourism town in the same region, expressed his own opinion about design in Shuimo, and both of them soon found that they shared the same set of values. Therefore, later when Keshi Chen's design won the competition and was to be implemented, the recovery of Shuimo became the joint experiment of two different groups of outsiders, one offering funding and implementation and the other providing local knowledge from previous experience.

5.3.2 Assignment of Obligations

If capable personnel were a prerequisite for a comprehensive plan and outstanding designs, then the assignment of their responsibilities is necessary for a smooth implementation of the plan. For each key construction project in Shuimo, the Foshan Assistance Group assigned one of their members to organize the whole construction process, including full responsibility to keep to the required timeline, and coordination with construction companies and localities. This assignment decision was made by Hongbao Liu, director of the Group. In Hongbao Liu's book, he explained some of his reasons for the assignment of obligations: (1) Pinchao Liang was responsible for the Shuimo Middle School Project because it was budgeted to cost more than 100 million yuan (approx. 14.7 million US dollars), higher than any other project assisted by Foshan; in addition, the budgeted investment was rather coarse because there was no construction drawing at the time of the bid, and even 10 percent over the budget would be more than 10 million yuan (approx. 1.47 million US dollars). Although Pinchao Liang had never led a construction project, his working experience in the Foshan Fiscal Bureau had prepared him to be sophisticated about money (H. Liu, 2011, p. 58). (2) Shufeng Chen and Dongkai Zhang were assigned to the Chanshou Old Street Project because the biggest difficulty of this project would be the coordination with local villagers, and these two members had years of working experience in government-led construction and were experienced in dealing with complex relations (H. Liu, 2011, p. 59). (3) Hongguang Liu was to work on the first industry-supporting project of assisting the Jiuzhai Tea Co. It was most appropriate to place an auditing expert in this position because the Foshan Assistance Group would be working with a private enterprise (H. Liu, 2011, p. 58).

According to Hongbao Liu's own review, he treated this assignment of obligations as an overall success (H. Liu, 2011, p. 59). Seen from the outcomes of the reconstruction, the members from the Foshan Assistance Group each took advantage of what they were good at, which was an essential component in the relatively smooth implementation process. From this point of view, Hongbao Liu and his colleagues acted as the local leaders in this formal and government-led reconstruction.

5.4 Maintenance of Implementation Speed

How to initiate and maintain incentives for the Foshan Assistance Group members and construction workers was a great challenge given the tight schedule. I have identified two sets of strategies applied to two different groups of individual participants:

(1) Mixed management method for the Foshan Assistance Group members.

Hongbao Liu used to work in both government units and enterprises and thus he was well aware of the advantages of both types of management approaches. He applied a combined approach of both, attempting to mix the regulations of the “government” and efficiency of the “enterprises” together (H. Liu, 2011, p. 58). To be more specific, Hongbao Liu combined the personnel from the Foshan Working Group and the Foshan Assisting Shuimo Reconstruction Management Center and required all staff to be responsible for specific projects. By following one project from the start to the end, each person would experience the difficult responsibilities of the Foshan Assistance Management Center and learn to collaborate across departments (H. Liu, 2011, p. 58).

(2) Financial incentives for the construction workers.

A most important input in the physical reconstruction was the labor supply, or the construction workers. However, since all surrounding townships were recruiting workers at the same time, many of the projects led by the Foshan Assistance Group kept losing workers. For instance, the Qiang Town Project required only 1,000 workers on the site, but the number of workers it lost added up to almost 3,000 (H. Liu, 2011, p. 132). So the construction team set up two long-term recruiting centers in Chengdu, and several times, Yingze Xiao, the project leader, had to ask the foreman to contact workers beforehand from other construction projects, and he himself drove directly to the site and brought the workers back to Shuimo (H. Liu, 2011, p. 132). In the Six Bridge Construction Project, the workers would not want to come back to work before the Lantern Festival, while the project was to be turned over to local governments soon. Thus the foreman had to drive to the workers’ home and knocked on their doors one by one (H. Liu, 2011, p. 127). Furthermore, local construction workers from Sichuan Province usually were not willing to work overtime in order to accelerate the reconstruction process. One time Pinchao Liang had to coordinate with the Guangdong First Construction Company and request an urgent transfer of 300

skilled workers from the projects in Guangdong. The workers were assigned into teams on the way and started working immediately after they arrived at Shuimo (H. Liu, 2011, p. 80).

In order to maintain a rapid construction speed, the construction teams and companies not only arranged three shifts (day, night and midnight shifts) of workers every day, but also applied financial strategies to maintain their incentives. The Qiang Town Project paid wages higher than the market price, and they set up different levels of bonuses (by cash) to encourage the timely completion of construction tasks. Sometimes at midnight, Shufeng Chen and Dongkai Zhang would go to the site and gave 50 yuan by cash to each worker still working on the site (H. Liu, 2011, p. 133). As for the Shouxi Lake Project, the Guangdong Southern Construction Engineering Co. also used the “day-night” shifts for “5+2” days per week. They organized groups of 5 to 10 workers and provided a 150 yuan reward for each group completing the daily construction target safely. The rewards they sent out amounted to more than one million yuan (approx. 147,000 US dollar) in total (H. Liu, 2011, pp. 116-117).

5.5 Monitoring and Quality Control

The other side of the rapid reconstruction was the concern regarding the quality of post-disaster reconstruction. Despite the challenges from time constraints and the increasing prices of both building materials and labor inputs, the construction teams still followed a strict quality control procedure (Jing & Yang, 2009). During the whole construction period of the 29 large construction projects in the Central Village, no major safety accidents occurred in Shuimo (Zhongguo Gongcheng Zixun Xiehui, 2012). This was first because of the allocation of responsibilities onto each individual in charge of inspection. In addition, the Foshan Working Group and the Foshan Assistance Management Center co-edited a construction management manual and an internal management regulation manual that were both strictly enforced (H. Liu, 2011, p. 57). The quality control in Shuimo had three main aspects:

(1) Site selection.

One example was the Foshan Industrial Exhibition Center initially planned to be located at the entrance of Shuimo. However, the Guangdong International Engineering Consulting Company⁸¹, responsible for the overall supervision of the recovery of Shuimo, found after its investigation that the project was located on two major fault zones. The geological condition was not stable enough to support the plan, and there would be a high possibility of landslide once the building exceeded three stories. If the project was to proceed, then a 1.5~2 million yuan (approx. 0.22~0.29 million US dollars) stabilization must happen first, which would occupy the river basin, thereby increasing the flood risk. After repeated warnings from the consulting firm, the Guangdong Provincial Development and Reform Commission ultimately halted this project, which was already under construction at that time (Jing & Yang, 2009).

(2) High standards for building materials.

Public buildings, such as schools, health centers and other public facilities, were required to

⁸¹ Guangdong International Engineering Consulting Company was a professional consulting and supervising company (H. Liu, 2011, p. 58), yet I am not sure whether this was a private or government-owned enterprise. A similar condition applied to the Guangdong First Construction Company as a professional construction company. From this example of the Foshan Industrial Exhibition Center, however, we might infer that the Guangdong International Engineering Consulting Company was at least not hired by the Foshan Assistance Group.

resist 9 degrees of seismic intensity and all other building 8 degree of seismic intensity. This meant both higher quantities and quality in the building materials (Jing & Yang, 2009). The supervision agencies required all materials to be certified and followed a strict sampling and checking process. Without a phone call from the supervision agencies approving the qualification, none of the materials were allowed to be used in the construction (Jing & Yang, 2009; H. Liu, 2011, p. 133). For instance, during the construction of the Shuimo Middle School, a total of 1,082 batches of materials were examined, each batch including a dozen samples (Jing & Yang, 2009). One quality problem occurred in the Cultural Activity Center (West Qiang Hui) Project. Because the project was designed and constructed simultaneously, the construction company could not purchase all the steel at one time, so they obtained three tons of steel from the surplus from the Water Plant Project. However, this steel did not meet the design standards in two tests and eventually was not allowed to be used (Jing & Yang, 2009).

(3) On-site monitoring.

On-site supervision included detailed inspection during the construction process. For example, for each building in the Qiang Town Project, supervisory personnel inspected before pouring the concrete. They would require immediate correction if the structure failed to accord exactly with the building design and construction regulations (H. Liu, 2011, p. 133). In order to ensure the quality of the Qiang Town Project, the Guangdong International Engineering Consulting Company kept 7~8 staff on site to manage and inspect, which is more than the 4-5 staff normally needed for a project of this size (H. Liu, 2011, p. 133).

This Consulting Company was also responsible for the safety of working conditions, ensuring the security of scaffolding, electricity, and machinery. They urged the construction units to conduct pre-job training for workers. Sometimes they participated in the training process as well to enhance the workers' awareness of safety issues (H. Liu, 2011, p. 133).

CHAPTER 6 CONCLUSIONS AND FURTHER DISCUSSIONS

From the observations above, we have obtained a general idea of the processes and outcomes during and after the recovery of Shuimo (See Figure 19). By taking a closer look at how a variety of decisions were made, we can see the power relationships among different groups and the incentives that drove each group, and all these are key factors in affecting both the speed and quality of reconstruction. In this last chapter, I will propose some conclusions, including what I recognize as the key accomplishments and potential social costs in the recovery of Shuimo, followed by some takeaways for future disaster-recovery planning. I will end the thesis with more questions that arose through this research. These questions remain unanswered, but attempts to reveal part of the answers will help us as planners recognize what has been missing and what elements will be required in the future.

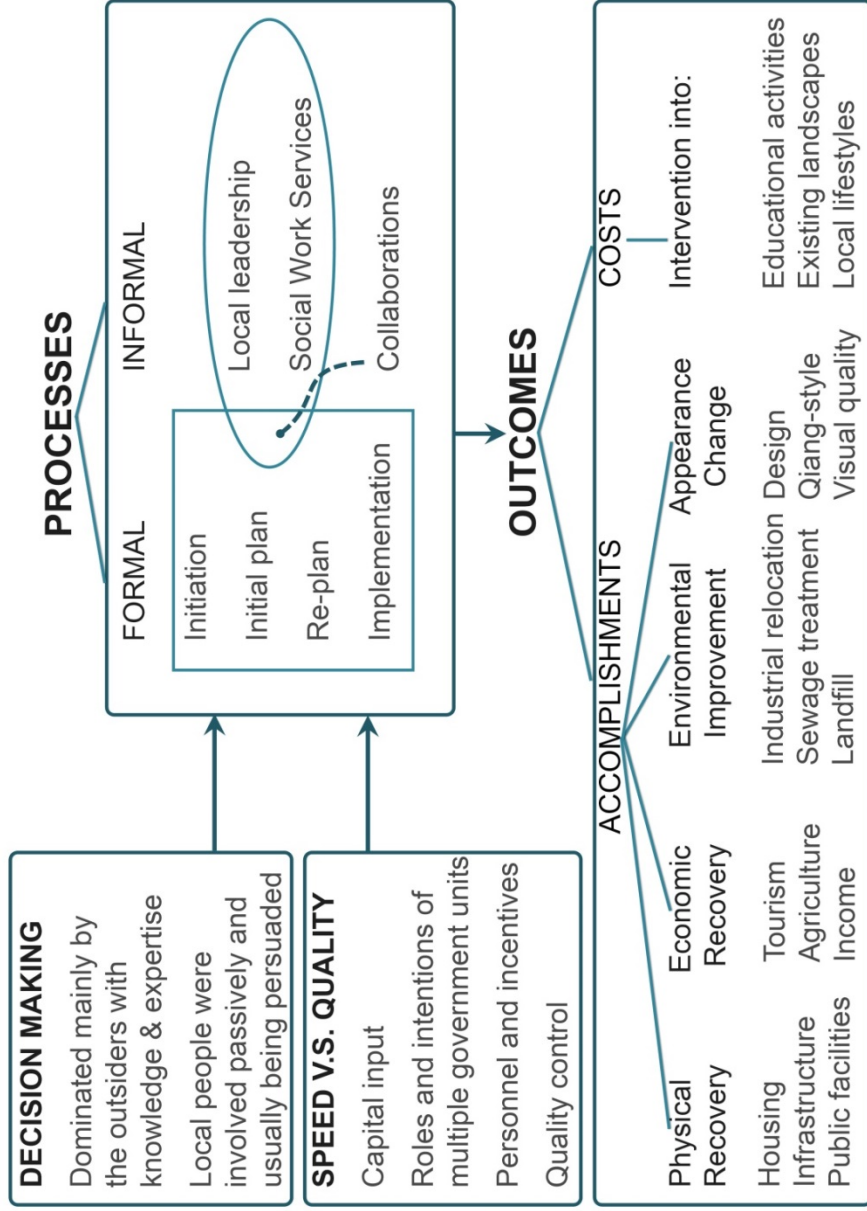


Figure 19 Summary of Contents

6.1 Accomplishments

The key accomplishments in the post-disaster recovery in Shuimo can be summarized as a rapid physical reconstruction process within two years after the earthquake leading to an impressive outcome of overall improvement in the following aspects:

- (1) Physical recovery, including newly constructed residences and public buildings under the requirement of higher seismic intensity standards, enhancement of internal and external accessibility, clean water and energy supplies, provision of educational services, public spaces for health care, cultural events, and recreational uses.
- (2) Economic recovery, including the overall industrial transformation from a household-based peasant economy and high energy-consuming industries to urban ecological agriculture and modern service industries (particularly tourism development), with associated increase of per capita income.
- (3) Environmental improvement, owing to the relocation of industries, expansion of the existing landfill, completion of new sewage treatment plants, and open spaces for emergency management and hazard mitigation.
- (4) Landscape, mainly referring to the comprehensive urban design of the township, unified style of architectural designs, and maintenance of the existing visual corridor.

6.2 Potential Costs

Despite all the accomplishments in the recovery outcome, I have recognized signs of some potential physical and social costs, through my research on the case of Shuimo, mainly coming from the rapid recovery and reconstruction speed. While I cannot deny that the post-Wenchuan Earthquake recovery “serves to accelerate urbanization” under the government-led top-down procedures “in a context of already rapid societal urbanization” and the pursuit of “town and country integration” (Abramson & Qi, 2011), what I have found is the existence of some unique features (and thus unique risks and social costs) during the fast post-disaster reconstruction, many of which are caused by the different values held by the insiders and outsiders. By pointing out these risks, I do not mean to blame anyone or any agency in this story. In fact, the individual and organizational participants involved in this case study performed quite admirably under difficult circumstances. The key message here is that we should all be aware of the prevalent existence of the vulnerabilities and potential costs, and thus need to learn from this case and carry this experience for future needs.

6.2.1 Quality of Physical Recovery

From the previous observations, we have seen the betterment in Shuimo through physical reconstruction, yet most attention has been put on the overall recovery and there has still been a lack of humanistic consideration in the detailed aspects, which reflects a common issue in the urbanization process in China and many other developing countries. For example, there is no secure pedestrian walkway from the settlement in Shuimo to its bus station. As a consequence, local residents and tourists have to walk through the narrow side on the highway. A string of ropes were set up on the side to prevent pedestrians from falling down to the valley (Figure 20). However, during my field visit, I still felt unsafe on the highway with cars running by right beside me.



Figure 20 Pillars and Ropes on the Side of Highway to Prevent Pedestrians from Falling Down

A few villagers made some complaints about their residences during our household survey. The problems ranged from design issues (i.e., the total building area was too small to use) to quality issues (i.e., sinking, leaking rainwater, ponding, etc.) (HH Survey, Q33_N). While the issue of sinking and leaking water should have raised the attention of all for flooding consideration (HH Survey, Q33_N), I have not yet found anything about it. As a comparison, most efforts in flood control were made in large-scale projects (i.e., the Shouxi Lake Hazard Mitigation Project assisted by Foshan).

Because the structural types of residences and the reconstruction modes varied from each other, quality of the buildings was not the same. Simply seen from the household survey, opinions of the interviewees also differed regarding the structural safety of residences and the earthquake safety of their communities (HH Survey, Q33_A & Q34_A): while most interviewees expected their residences and communities after the reconstruction to better resist future earthquakes, a few interviewees expressed their concerns on construction safety (HH Survey, Q33_N). In particular, one interviewee directly pointed out that his current residence was of poor quality, despite the good appearance seen from the outside (HH Survey, Q33_N). However, all these responses were not detailed enough for us to identify the causes of problems or the responsible

construction groups⁸².

Infrastructure and public facilities have been improved in Shuimo in general, but the experience of villagers varied due to their different locations: One interviewee in the rural area said that the electricity supply was more stable than before the earthquake, while three others from the Central Village complained that the water and electricity supplies were cut off more often than before the earthquake (HH Survey, Q33_N & Q34_H). Similar discrepancies existed when it came to public spaces: an interviewee told us that there was fitness equipment in every (rural) village, yet three others said that more public spaces and facilities were still needed, including open spaces, public bathrooms, and parking places. While we cannot make a judgment through the comments of only a few villagers, these notes have revealed the potential problems of poor construction quality under the rapid physical recovery.

⁸² The three housing projects mentioned in Section 3.4.2 were funded and built by the Foshan Assistance Group. The recovery of other residences out of the three projects was subject to the local government and residents and might have used different structural designs, quality standards, construction teams, and inspection approaches. Even in the Qiang Town Project, the Group only assisted in part of the reconstruction tasks (see the example in Section 6.2.4). This various arrangement of housing recovery made it difficult to identify how the issues claimed by each interviewee came out.

6.2.2 Changes of Landscape and Lifestyle

The residential resettlement process after the Wenchuan Earthquake caused many lifestyle changes (Peng, Shen, Zhang, & Ochoa, 2014, p. 109). Although there are often greater overall benefits for rural resettlement through land exchange policies or even “relocation and potential abandonment” of previous village sites (Olshansky, Nakabayashi, & Ohnishi, 2006; Peng et al., 2014, p. 122), we cannot deny the social vulnerability induced by the relocation process, mainly due to the loss of social capital and breakage of cultural linkages (H. Liu, 2011, p. 22). While these extreme conditions of distant relocation did not apply to Shuimo⁸³, the changes in the residential landscape and forced changes of original lifestyle posed similar problems here: some villagers were relocated in another location within the same village, but much farther from their farmland, making it inconvenient to take care of their crops; for some whose residences were renovated with clean and tidy appearances, they were required to plant flowers around their houses when they themselves valued edible vegetables instead of flowers (H. Li et al., 2011, pp. 62-63); some interviewees further complained about the inconvenience of going upstairs and downstairs of living in the new apartment buildings compared to their previous one-story rural house, and the agricultural products rotting easily because of the poorly ventilated roof of the new buildings (HH Survey, Q33_N & 34_H). These problems resulted from the contrasting values of the outsiders and the local people, and at this stage, we have not observed all the induced social costs because the changes are still ongoing: with the development of tourism, the local villagers changing from farmers or workers into merchants, start to accept the values of modern consumerism and commercialism (H. Liu, 2011, p. 146; Z. Tang & Zhang, 2010, p. 1217). It is way too early to see where how far this will go.

⁸³ Because a majority of the villagers in Shuimo were resettled in situ or within the same village, and only a small proportion of them was relocated to another village with the township.

6.2.3 Local Needs and Public Participation

Set within the context of conflicting values between the insiders and outsiders is the issue of public participation in the post-disaster recovery process. In the case of Shuimo, the outsiders, in particular the Foshan Assistance Group and professional experts, have had more power to make the reconstruction decisions. Localities, meaning both the local residents and government officials, lost their voice to some extent in deciding what kind of town and life they would want to recover. In many of the local decision making stories, we have seen how the Foshan Assistance Group, with their broad expertise, persuaded local people to accept their ideas and intentions. It is hard to conclude whether there had been a final consensus after each coordination process, when it was always the same group of people selling their ideas and convincing another group of people. Regardless of which position was better for Shuimo, either in the short term or in the long term, it is fair to say that the imbalance of deciding powers created a potential risk of the reconstructed town not being able to meet local needs, such as in providing equity for all members of the community.

Local residents were, in fact, involved in the recovery of Shuimo, but mostly in the informal processes, such as the villager autonomy in the construction of Foyuan Road. In the formal counterpart assistance projects, local workers were involved, but only in basic jobs, like transporting building materials. Furthermore, all of these examples of involvement belonged to only the implementation phase, but not the planning and deciding phase. As a consequence, some of the local needs were disregarded, among which the most urgent one was the funding need for individual housing recovery.

According to the response of one interviewee, the Foshan Assistance Group only funded reconstruction within five meters from the Chanshou Old Street, but the rest of the construction work was subject to the owners (HH Survey, Q23). This interviewee spent 400,000 yuan on the reconstruction, of which only a small proportion was from government subsidy⁸⁴. As the interviewee mentioned, residents with *hukou* in urban areas were not eligible for government

⁸⁴ According to this interviewee, the government subsidy of housing reconstruction for urban residents (people with *hukou* in urban areas) was 23,000 yuan per household, with an additional 3,000 yuan for each additional person in the household (HH Survey, Q23). Other interviewees with urban *hukou* claimed to have received government subsidies ranging from 8,000 yuan to 24,000 yuan (HH Survey, Q23 & Q26).

non-interest loans during the reconstruction, so he had to spend all his savings (more than 100,000 yuan) and further borrow money (around 200,000 yuan) from his friends to complete the construction (HH Survey, Q23). This was not a unique case. In fact, a majority of interviewees relied on their personal savings as the key source of funding for residence recovery⁸⁵ (HH Survey, Q32). Another interviewee could not move to his residence in the Qiang Town because he could not afford the 180,000 yuan cost for it with the only 50,000 yuan compensation from land acquisition. In this case, the local government would not let him move into the residence although the interviewee was relocated to it according to the plan (HH Survey, Q20).

⁸⁵ Thirty-seven interviewees (out of 49) listed personal savings as one source of funding for their residence recovery, among which 27 interviewees listed personal savings as providing the most amount of funding for residence recovery, compared to all other sources, including government grant, government loans, commercial loans, others' assistance, etc. (HH Survey, Q32).

6.2.4 Intervention into the Normal Education System

From the previous sections, we have seen how Shuimo received a variety of external funds through the strategies by the Foshan Assistance Group. The small township became well-known afterward, which is good for its tourism. But for local education, it might be another story. Under the newly built environment, students, teachers, and administrative staff in schools all feel the stress of trying to meet higher educational expectations, because of the new facilities. Wang (2010) conducted a survey on the students and teachers in two middle schools⁸⁶ in Wenchuan County, including the Shuimo Middle School, which documents some of the stress on each of the three aspects—schools, teachers, and students—and how they intertwined together to create a complicated condition.

(1) Schools

Although high school enrollment rates of graduates were typical of middle schools in China, the schools were excessively concerned with meeting new high expectations of their communities. Under the fierce competition to attract more financial support and recruit more students, in order to meet new higher expectations, some schools started to make changes to their administrative approaches and involve students in the assessment of teachers' performance, i.e., adding students' comments as one of the elements of the evaluation of teaching. However, some students retaliated against those teachers who had criticized them; on the other hand, some teachers, in order to receive high scores in the evaluation, chose not to criticize the students. As a consequence, these new policies in the school put teachers and students against each other and undermined teacher-student relations (Y. Wang, 2010, p. 33).

(2) Teachers

According to the survey of some teachers, the schools had better teaching facilities after the reconstruction, but other aspects of the educational system were still deficient, including the professional levels of existing teachers. Many of the teachers who previously taught in the school

⁸⁶ The Wenchuan No.1 Middle School and the Wenchuan No.2 Middle School (also named Shuimo Middle School). Although we cannot differentiate which survey details came from which school, the research in general reflected the problems in the post-recovery education system.

might lose their job under the formal evaluation process. In addition, one teacher commented that “the new school was more utilitarian” and put too much effort into meeting the inspections of various political leaders and displaying the “best side” of the post-quake schools. Each time, the preparation would take a long time, thereby delaying teaching activities (Y. Wang, 2010, p. 33).

(3) Students

To welcome all the inspections from government officials, news journalists, and professional experts, the schools would ask the students to do the cleaning. Ironically, the students were willing to do so, given that they could escape from classes and meet to the outsiders. This may have increased the teacher-student conflicts (Y. Wang, 2010, pp. 33-34).

One source of the problem is the rapid transformation of the physical conditions in the schools⁸⁷. The counterpart assistance groups, when building those schools, wanted the best for the disaster affected areas, but simply improving the physical quality of the schools has not necessarily resulted in perfect consequences.

⁸⁷ It is true that changes in home lives after the earthquake also created stress for students. But what I want to emphasize here is the interruption of normal educational activities at school, which could have been avoided.

6.2.5 Regional Perspective: IMBY and NIMBY

From a larger view and a regional perspective, Shuimo was a unique case in the post-Wenchuan Earthquake recovery in China. Not every township attracted as much attention and funding as Shuimo did. When the majority of energy-consuming industries moved out of town and a couple of educational institutes moved in, it meant the industries moved somewhere else and some townships were losing those schools. This is not exactly the in-my-backyard (IMBY) or not-in-my-backyard (NIMBY) issue, but is quite similar: someone from outside came in and said, “not in their backyard”. The state policies did address the regional industrial relocation issues according to the post-disaster suitability evaluation, but the counterpart assistance program resulted in faster changes of the geographical patterns, especially the relocation of industries, jobs, public facilities, and the population attached with them, often as a source of customers for local service industry. For example, the Aba Normal College brought in thousands of students to Shuimo and supported local businesses. In Weizhou Town, where the college used to be located, previous restaurants, retail stores and transportation services were deeply influenced, and thus local landlords and taxi drivers in such places would never think the relocation of Aba Normal College a good decision (H. Li et al., 2011, p. 62). It is common that some people gain while some others lose from reconstruction decisions. But the rapid decisions made in this process have created some new regional inequity issues.

6.3 Lessons to Learn in Post-disaster Recovery

Based on the accomplishments and potential costs discussed above, there are some lessons we can learn and take away from this case study, for policy makers, for professional planners, and for all other participants.

6.3.1 Counterpart Assistance System

From a regional perspective, the national counterpart assistance program played an essential role in the overall PWERR, especially under the context of China with a top-down governmental system. The NCA turned out to be rather effective in bringing in all kinds of resources to the disaster affected areas (J. Xu & Lu, 2013), and by creating a competitive atmosphere, it triggered the incentives of the assistance government units to achieve both speed and quality: the assistance group members, would feel ashamed and lose face if they fell behind other assistance groups; and under such peer pressure from the time constraints, they would still want to complete their tasks with high quality because their names were recorded in each assisted project and their individual political careers were linked to the quality of physical reconstruction.

Moreover, the NCA made it possible for different places to share knowledge and exchange ideas in the PWERR, and both participants benefited from the conversation and mutual learning process. Hongbao Liu brought to Shuimo his own experience assisting the relocation of high energy-consuming ceramics factories out of Foshan (H. Liu, 2011, p. 99). The Foshan Assistance Group, under his leadership, helped formulate a mixed source of income for local households from both modern agriculture and tourism services and assisted private enterprises to promote productivity and reduce future vulnerabilities at the same time (Peacock et al., 2008, p. 5), increasing economic diversity and promoting economic resilience in the local communities (Yu Xiao & Drucker, 2013, p. 156; Y. Xiao & Van Zandt, 2011, pp. 2527-2528, 2538). And what Foshan learned from Shuimo was how to identify the uniqueness, or the “native gene”, of localities (H. Liu, 2011, pp. 169 & iii, preface), and to rely on these features for future prosperity (H. Liu, 2011, p. 237).

In addition, although the NCA happened in China under a centralized political regime (J. Xu & Lu, 2013, p. 88; P. Xu et al., 2014, p. 431), it displayed some decentralized features and allowed

the paired government units to be creative in the recovery process. In Shuimo, the Foshan Assistance Group adopted a bidding process to select the recovery plan for Shuimo, which was quite different from the routine planning procedure in China. Later, Hongbao Liu also assigned the coordination tasks of simultaneous construction projects to individual members, further triggering innovative solutions in the difficult times. Furthermore, Guangdong Province and Wenchuan County have shown signals of the transformation from the one-assisting-another condition to a mutual cooperation stage (Section 5.2.3), in industrial development, labor sharing, as well as urban management, which might possibly achieve win-win outcomes in the long run (H. Liu, 2011, pp. 144, 165; T. Liu, 2010, pp. 68, 91; Yong & Booth, 2011, p. 235).

The NCA policy was not perfect, though. There are several problems during the implementation of this national policy, including: (1) the assistance units and counterpart units were placed at unequal status and given imbalanced power to negotiate by both the administrative hierarchy and the availability of resources⁸⁸; (2) competition and peer pressures among different assistance groups might have also led to insufficient deliberation due to the high efficiency of reconstruction; (3) the pure government behaviors in many cases disregarded cooperation with other agencies and resources from informal processes (Chang, Wilkinson, Potangaroa, & Seville, 2012; J. Xu & Lu, 2013, pp. 88-89). All these drawbacks have left potential costs to the disaster affected areas, both physically and socially (as discussed in Section 6.2).

What we can learn from here is that the counterpart assistance system can address the needs of both speed and quality and it can allow both knowledge sharing and innovations in post-disaster recovery, but policy makers should adjust the design of such program in the future according to the situation at hand: the emphasis of the program should lean somewhere differently between speed and deliberation based on the scope of affected area and the degree of damage; and in order to coordinate the imbalanced power relations between the aid-provision and aid-reception units, new mechanisms should be introduced to the decision making of pairing and defining the content of assistance, such as inviting third-party organizations.

⁸⁸ Refer to Appendix B for the hierarchy of government units involved in the recovery of Shuimo.

6.3.2 The Power of Planning

Much previous research has explored the role of planners and power of planning in creating resilient communities (Blanco et al., 2009, p. 204; Burby et al., 1999; Olshansky, 2006; Olshansky et al., 2012; Olshansky & Johnson, 2010). The power of planning in creating a new Shuimo was clearly revealed through the actions of the Foshan Assistance Group: through planning, re-planning, organizing planning contests and bidding, the team successfully introduced a large amount of external funding to the small town of Shuimo, without which they would possibly not be able to achieve the accomplishments of the physical reconstruction. The whole process took as long as seven months, with several setbacks along the way, but it succeeded in the end.

Where did this power of planning come from? First, it originated in the interest and support from all the stakeholders (government agencies of all levels, technical experts, diverse social organizations, media, and local residents). It was by drawing the attention of a variety of people that the planning events could absorb their resources (also capital) into the locality (Shuimo here). Second, the power of planning was authorized to the assisting government units by the Central Government. In other words, the NCA empowered the Foshan Assistance Group to dominate the plan making process and direct the recovery of Shuimo. Third, the power came from expert planning knowledge. With expertise in urban development strategies, the experienced outsiders persuaded the local residents and even government officials of their vision for Shuimo. These three sources help explain how the Foshan Assistance Group managed to finance the long list of assisted reconstruction projects. Although it resulted in a successful rapid physical reconstruction, this planning method overlooked some other important aspects of creating a successful community, given the significant changes accomplished in such a short period of time. Potential social costs can occur even if the intentions were for the betterment of the localities. The disruption of the normal educational activities was one example of excessive attention induced by the power of planning, and the lack of consideration in landscape and lifestyle changes could be seen as a negative effect from the over-confidence and the incomplete local knowledge of the outsiders.

Therefore, the lesson from the case of Shuimo is that post-disaster recovery planning can be

powerful in financing reconstruction projects, yet the three sources of power (interest and support of stakeholders, authorization by Central Government, and expertise of experienced planners) might lead to potential social costs for localities, calling for careful use of it. This has proposed challenges and higher standards for civil society. External participants in the recovery process should always be aware of the limitation of their own knowledge and take into consideration local needs. In this sense, more public participation is needed so as to minimize the negative effects from the power of planning.

6.3.3 The Role of Planners

In the case of Shuimo, government officials from the counterpart assistance group acted as “planners” for the town under most circumstances instead of professional planners. We may argue that the government-led recovery planning was about politics (Olshansky & Johnson, 2010, p. 231; J. Xu & Lu, 2013, p. 88), but disregarding the political positions and careers of the group members, a more important question is: What can we learn from their experience in Shuimo about the appropriate role of planners in post-disaster recovery?

First, planners should be aware of their power at hand. For a place with few resources to use, like the post-quake Shuimo, it is appropriate for planners to raise attention from outside and attract various external resources through planning activities. While planners should make sure that the overall vision is attractive enough and the recovery plan is persuasive enough, they themselves do not have to make decisions on which plan to adopt. The Foshan Assistance Group provided us with an alternative approach: the bidding process. By excluding the assistance group members out of the vote to determine the final plan, the group let the others decide.

Second, planners can perform innovative approaches to balance speed and deliberation. Under tight time constraints in post-disaster recovery, planners can plan more efficiently through “iteration”⁸⁹ or increasing local “planning capacity” (Olshansky et al., 2012, pp. 176-177), and they can also learn from the Foshan mode, that is, to compress the implementation time to the fullest and take as long time as possible beforehand to deliberate. This approach requires an accurate estimate of the implementation process and coordination from the construction teams, though. The Foshan experience is not a perfect model, considering some of the problems with recovery quality, but it has offered a lesson applicable to decision making in the normal urban development and general planning process.

Third, when outside planners and officials propose physical betterment (Olshansky et al., 2012, p. 176; Olshansky & Johnson, 2010, p. 218) and local people resist, how should the planners respond? Is it the right thing to convince the local people? My answer to this question is yes if

⁸⁹ Iteration here means “doing some things immediately with little forethought, more things a little later with a little more forethought, and some things only after a great deal of forethought” (Olshansky et al., 2012, p. 176).

under normal conditions, but when it comes to post-disaster recovery, the answer depends. The key difference is whether the local people and the outsiders are in the same power positions. If the local people have already lost the power to speak due to the lack of social resources after the disaster, then planners should first investigate the reasons why the local people resist. By understanding the real local needs (e.g., for more funding for housing recovery, as implied in Section 6.2.3) through public involvement, planners can help some potential social costs in the compressed planning and redevelopment process, leading to an outcome even better than the planners' imagined betterment.

In short, planners should use their power to attract external resources, be innovative to balance speed and deliberation, and address the mismatch between local needs and outsiders' visions during the recovery planning process.

6.4 Questions Unanswered

Many questions remain unanswered, including some we have already touched on in the previous sections.

First, we are not able to provide an overall assessment of the recovery in Shuimo partially due to the insufficient information. The central question is how township residents view the case of Shuimo and how their views might change as time goes by. In particular, what did the plan mean to them: a shared vision of local villagers, a cultural intrusion from the outside, or simply a pretty plan to attract tourists? Although we have some notes from the household survey, the coverage of samples has been far from enough to draw conclusions. In addition, it is difficult to identify the reference system the interviewees used when making comments: When they were saying good or bad, better or worse, were they compared to the pre-quake conditions in the same place or the post-recovery conditions in other places, or to an ideal living condition in their minds?

Second, how well would the counterpart assistance system work in other places? We have observed from Shuimo how the NCA program has worked and left potential social costs, but these observations are in the context of China with a centralized hierarchical political system. We need to know to what extent the counterpart assistance system will still be effective in directing resource relocation and what unexpected difficulties it might face in a more decentralized governmental system before transplanting this national policy to somewhere else.

Third, more discussions on the theoretical questions are needed. For example, what is the appropriate goal for the recovery of localities in general, simply back to the level of previous conditions, with a few additional improvements, or the best outcomes available? How do we know which vision is good and which is bad beforehand? In reality, who should decide? Through what decision making process? How to ensure the shared vision and positive outcomes to be achieved through certain implementation processes and good intentions? The list will go on to the balance between speed and quality, speed and deliberation, local development and regional equity, etc. We may well reach different conclusions from various cases, yet the previous experiences to address specific conditions matter in directing future reactions. Therefore, it is essential for future research to continue the exploration.

APPENDIX A: GLOSSARY

A.1 List of Acronyms

CAO	Counterpart assistance office
CPPCC	Chinese people's political consultative conference
FAUPD	Foshan Academy of Urban Planning and Design
FFB	Foshan Fiscal Bureau
FOCABFM	Foreign and Overseas Chinese Affairs Bureau of Foshan Municipality
MOHURD	Ministry of Housing and Urban-Rural Development
NCA	National counterpart assistance program
NDRC	National Development and Reform Committee
PCAP-PWERR	Plan of Counterpart Assistance Program for Post-Wenchuan Earthquake Recovery and Reconstruction
PLA	People's Liberation Army
PWERR	Post-Wenchuan Earthquake recovery and reconstruction
SOP-PWERR	State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction
SPPLIA	Specialty Plan for Productivity Layout and Industrial Adjustment
WEDRRA	Wenchuan Earthquake Disaster Recovery and Reconstruction Act
WERRH	Wenchuan Earthquake Rescue and Relief Headquarters
WERRH	Wenchuan Earthquake Rescue and Relief Headquarters

A.2 List of Government Agencies and Organizations

Category	Full name	Shortened name
Government units	The Central People's Government of the People's Republic of China	Central Government
	People's Government of Guangdong Province	Guangdong Provincial Government
	Sichuan Provincial People's Government	Sichuan Provincial Government
	Wenchuan County Government	
	People's Government of Aba Tibetan and Qiang Autonomous Prefecture	Aba Autonomous Government Aba People's Government Aba Prefecture Government
	Shuimo Township Government	
	Foshan Municipal Government	
	Government of the Hong Kong Special Administrative Region of the People's Republic of China	Hong Kong Government
Counterpart assistance agencies	Counterpart Assisting Shuimo Reconstruction Management Center	Foshan Assistance Management Center
	Foshan Counterpart Assisting Shuimo Recovery Municipal Leading Group	Foshan Leading Group
	Foshan Counterpart Assisting Shuimo Recovery Working Group	Foshan Working Group
	Foshan Municipal Development and Reform Bureau	
	Foshan Academy of Urban Planning and Design	
	Foshan City Planning Bureau	
	Foshan Construction Engineering Trading Center	
	Foshan General Chamber of Commerce	
Other sources of external support	Foshan Overseas Association	
	Foshan Women's Association	
	State Key Laboratory of Hydraulics and Mountain River Engineering at Sichuan University	
Companies involved in urban design, inspection, & construction	Sichuan Beite Construction Engineering Co., Ltd.	Chengdu Beite
	Chengdu Design and Engineering Co. of Light Industry in China, Ltd.	Chengdu Light Industry Design
	Chengdu Lvyin Landscape Engineering Co., Ltd.	Chengdu Lvyin Landscape
	China Huaxi Engineering Design and Construction Co., Ltd.	China Huaxi
	Chongqing Weitai Construction Engineering Co., Ltd.	Chongqing Weitai
	Guangdong Province First Construction Engineering Co., Ltd.	Guangdong First Construction
	Guangdong Province Gaozhou Municipal Construction Engineering Co.	Guangdong Gaozhou

	Guangdong Hongmao Construction Monitoring Co., Ltd.	Guangdong Hongmao
	Guangdong International Engineering Consulting Co.	Guangdong Int'l
	Guangdong Jianyue Engineering Co., Ltd.	Guangdong Jianyue
	Guangdong Southern Construction Engineering Co., Ltd.	Guangdong Southern
	Guangdong Wuhong Construction Co., Ltd.	Guangdong Wuhong
	Peking University Institute of Urban Design	PKU Urban Design
	Sichuan Bin Wang Tourism Project Management Co., Ltd.	Sichuan Bin Wang Tourism
	Sichuan Guoheng Architecture Design Co., Ltd.	Sichuan Guoheng Architecture
	Sichuan Mingyang Construction Monitoring Co., Ltd.	Sichuan Mingyang
	Sichuan Sanxin Construction Engineering Co., Ltd.	Sichuan Sanxin
	Sichuan Provincial Institute of Water Conservancy and Hydropower Survey and Design	Sichuan Water Conservancy
	Sichuan Yongyi Construction Engineering Project Management Co., Ltd.	Sichuan Yongyi
	Southwest China Academy of Architecture Design	Southwest Architecture
	Hong Kong Zhongying Institute of Urban and Architecture Design	Zhongying Design

A.3 List of Individual Participants⁹⁰

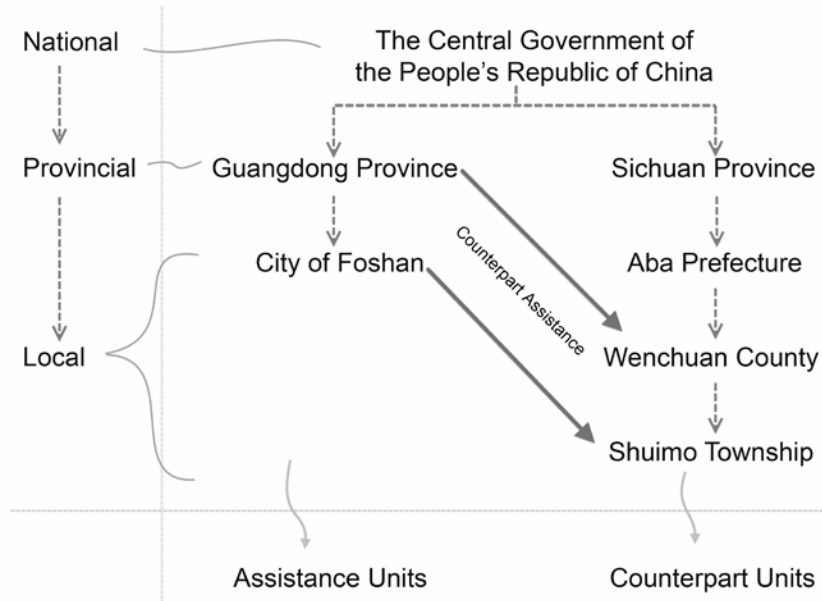
Keshi Chen	Chief designer in the post-disaster recovery of Shuimo. Director of the Peking University Institute of Urban Design and expert in the design of mountainous townships and tourism towns.
Maohui Chen	Director of the Guangdong Provincial Assistance Group.
Shufeng Chen	Professional planner from the Public Affairs Management Bureau in Shunde District, Foshan, and member of the Foshan Assistance Group. Leader of the Chanshou Old Street Project and deputy director of the Old Street Relocation Headquarters.
Yunxian Chen	Mayor of Foshan.
Linxiang Cheng	A villager in Lianshanpo Village, the story of whose family touched the Foshan Assistance Group and ultimately led to the construction of Foyuan Road.
Yuan Feng	Pervious supervisor of Hongbao Liu's in Guangzhou who initiated the idea of promoting Qiang ethnic culture in Shuimo.
Huahua Huang	Guangdong Provincial President.
Xieqin Huang	Government official of the Foshan Transportation Engineering Quality Inspection Station, and member of the Foshan Assistance Group. Leader of the road construction team.
Jun Li	Government official from the Foshan Municipal Development and Reform Bureau and member of the Foshan Assistance Group.
Pinchao Liang	Chief of the Foshan Fiscal Bureau.
Guoping Liu	Government official from the Foshan Municipal Development and Reform Bureau.
Hongbao Liu	Director of the Foshan Assistance Group (the Foshan Working Group, to be specific) and (Interim) Deputy Secretary of Shuimo during the counterpart assistance. He used to be the Foshan Municipal Development and Reform Secretary at the time the Wenchuan Earthquake happened.
Hongguang Liu	Member of the Foshan Assistance Group and auditing expert supporting the recovery of the Jiuzhai Tea Co.

⁹⁰ The individual participants are arranged in alphabetical order of their last names.

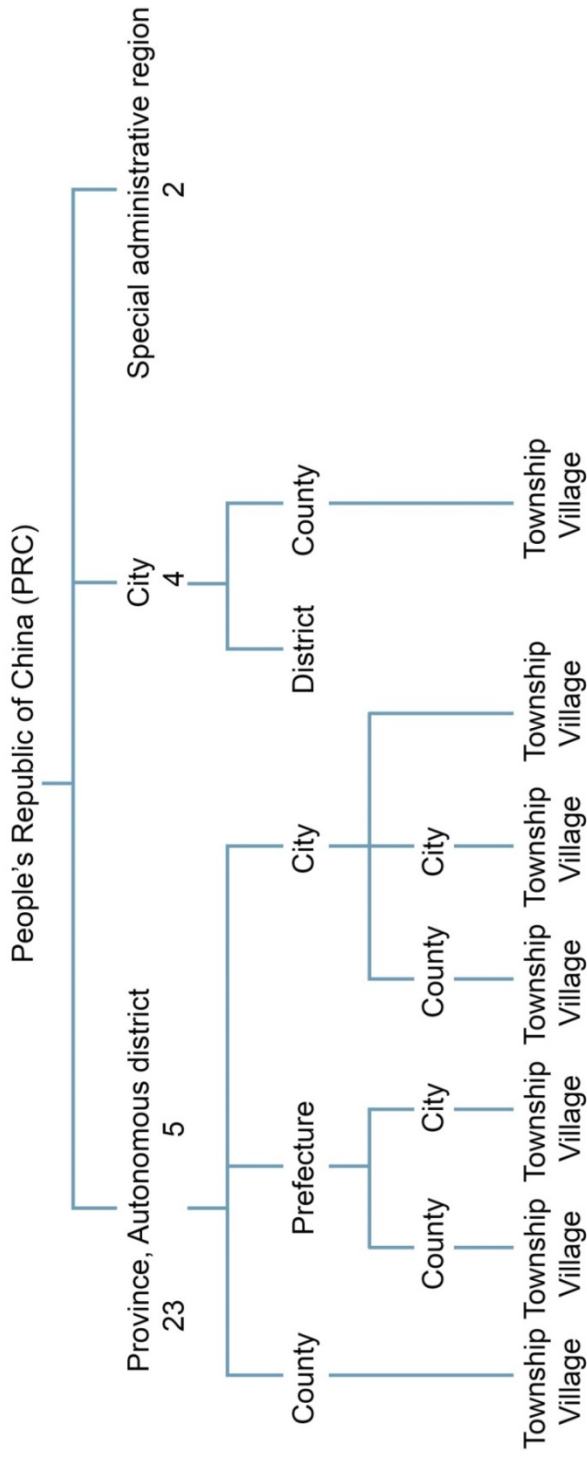
Qibao Liu	Secretary of Sichuan Provincial Party.
Jihua Luo	Mayor of the Town of Shuimo and commander of the Old Street Relocation Headquarters.
Yongjun Peng	Founder of the Youngjun Duck Industry, an ecological duck breeding base in Lianshanpo Village, Shuimo.
Lidong Qing	Secretary of Wenchuan County from December 2008 to February 2014.
Bin Wang	Secretary of Wenchuan County before December 2008.
Yang Wang	Secretary of Guangdong Provincial Party.
Ruilun Xian	Deputy Mayor of Foshan.
Yujing Xian	Government official from the Foshan Municipal Development and Reform Bureau.
Yingze Xiao	Committee member of the economic development park in Chancheng District, Foshan, and member of the Foshan Assistance Group. Leader of the Qiang Town construction team.
Jie Yin	Assistant Designer in Keshi Chen's team and professor at Peking University.
Pingliang Yu	Chief of Laoren Village in Shuimo.
Dongkai Zhang	Government official from the Public Affairs Management Bureau in Shunde District, Foshan, and member of the Foshan Assistance Group. Leader of the Chanshou Old Street Project.
Xuelin Zhang	Party Branch Secretary in Xianfengyan Village.
Xia Zhou	Deputy director of the Foshan City Planning Bureau. Member of the Foshan Assistance Group and the (Interim) Deputy Mayor of Shuimo during the counterpart assistance.

APPENDIX B: HIERARCHICAL GOVERNMENT UNITS

B.1 Government Units Involved in the Recovery of Shuimo



B.2 Administrative Hierarchy in China



Source: Website of the Central Government of the PRC (http://www.gov.cn/test/2005-06/15/content_18253.htm).

Notes:

- (1) The numbers in the figure indicate the total numbers of administrative provinces (cities, regions, etc.) listed above.
- (2) Cities can be in different hierarchy in the administrative system in China, ranging from provincial level to local levels. The four cities directly under the Central Government are Beijing, Shanghai, Tianjin and Chongqing. The two special administrative regions are Hong Kong and Macao.
- (3) County in the figure can sometimes mean “autonomous county”. Similarly, there are also autonomous villages. All prefectures are autonomous prefectures.

APPENDIX C: LIST OF PAIR ASSISTING PROJECTS

C.1 List of Projects Built by Foshan on Behalf of Shuimo

Project name	Content	Budgeted investment		Source of funds	Location	Planned time		Designed by	Monitored by	Constructed by
		(thousand yuan)	(thousand dollars, approx)			Start	End			
Survey and investigation		1,000	147	FFB	Central Village					FAUPD
Urban Design	Landscape design, detailed planning, etc.	2,000	294	FFB	Central Village			PKU Urban Design; Zhongying Design; Southwest Architecture		
Qiang Town	350 housing units for resettlement, building area 40,000 square meters. Estimated total construction costs 112 million yuan (based on 2,800 yuan per square meter), plus 10.65 million yuan of compensation for the land acquisition.	122,650	18,037	FFB	Laoren	Sep-2009	May-2010	Zhongying Design; Sichuan Guoheng Architecture ; Sichuan Bin Wang Tourism	Guangdong Int'l	Chengdu Beite; Guangdong Wuhong
The Second Farmers' Market in Shuimo	Land area 5000 square meters, building area over 1,500 square meters, including 30 booths.	6,000	882	FFB	Laoren	Sep-2009	May-2010			
Dayandong Water Plant	Newly built: Water supply capacity 3,000 tons per day. Around 6 kilometers' water supply pipes.	20,000	2,941	FFB	Dayandong	Jun-2009	Nov-2009	China Huaxi	Sichuan Mingyang; China Huaxi	Chongqing Weitai

Water supply pipes in the Central Village	Capacity of 30,000 people in the Central Village; around 29.8 kilometer water pipes.	15,000	2,206	FFB	Central Village	May-2009	Nov-2009	China Huaxi	China Huaxi	Guangdong Jianyue
Shuimo Middle School	Total building area of around 42,000 square meters, in which: (1) teaching building 24,160 square meters; (2) dormitory 14,900 square meters; (3) bridge 2,090 square meters. Plus, an additional 43,280 square meters of sport area, administrative roads, and green space, and 3,600 square meters of temporary building area for teachers and staff.	169,520	24,929	FFB	Central Village	Mar-2009	Aug-2009	PKU Urban Design; Zhongying Design; Southwest Architecture	Guangdong Int'l	Guangdong First Construction
Wenchuan No.2 Kindergarten	Total building area of 2,662 square meters	14,530	2,137	FFB	Central Village	Mar-2009	Aug-2009	PKU Urban Design; Zhongying Design; Southwest Architecture	Guangdong Int'l	Guangdong First Construction
Shuimo Health Center	Total building area 5,079 square meters, with facilities.	19,100	2,809	FFB	Central Village	Mar-2009	Oct-2009	PKU Urban Design; Zhongying Design; Southwest Architecture	Guangdong Int'l	Guangdong Gaozhou
Shuimo Welfare Center	Total building area 7,500 square meters, 300 beds, and treating facilities.	26,000	3,824	FFB	Central Village	Mar-2009	Oct-2009	PKU Urban Design; Zhongying Design; Southwest Architecture	Guangdong Int'l	Guangdong Gaozhou
Cultural Activity Center	Also named the West Qiang Hui: Total building area about	20,000	2,941	FFB	Central Village	Jun-2009	Mar-2010	PKU Urban Design; Chengdu	Guangdong Int'l	Sichuan Sanxin

	3,000 square meters									Light Industry Design; Zhongying Design;		
Sports and recreational park	Total land area around 20,000 square meters, with a capacity of 1,000 people. Area of slopes for disaster remediation 80,000 square meters, area of public green space 50,000 square meters.	37,000	5,441	FFB	Central Village	Oct-2009	May-2010	Guangdong Hongmao		PKU Urban Design; Zhongying Design; Chengdu Lvying Landscape		
Shouxi Lake hazard mitigation and water conservancy facilities	Total area 53,000 square meters, total length of levees around 3.4 kilometers. Two new dams, 300 meters and 1,000 meters long respectively.	157,900	23,221	FFB	Central Village	Aug-2009	Jun-2010	Sichuan Yongyi		Sichuan Water Conservancy; Zhongying Design; Chengdu Lvying Landscape; etc.		Guangdong Southern
Renovation of the old Xuankou-Sanjiang Highway within Shuimo	1,000 meters	30,000	4,412	FFB	Central Village	Oct-2009	Dec-2009					
Shuimo Avenue	Shuimo Revenue: 960m long, 12 meters wide, plus 2.17 million US dollars investment on the attached pipes on both sides.	14,800	2,176	FFB	Central Village	Jun-2009	Dec-2009					
Foshui Road	Foshui Revenue: 800m.	8,000	1,176	FFB	Central Village	Jun-2009	Dec-2009					
Shouxi Road	1,500 meters	15,000	2,206	FFB	Central Village	Jun-2009	Dec-2009					
Foshan Bridge	72.86 meters long.	11,800	1,735	FFB	Shuimo	Nov-2009	Apr-2010					

	29-34 meters wide.																		
Chancheng Bridge	80 meters long, 12m wide, including shelters against rain. The bridge serves pedestrians only.	15,000	2,206	FFB	Central Village	Sep-2009	Dec-2009												
Nanghai Bridge	110.16 meters long, 10 meters wide.	12,700	1,868	FFB	Central Village	May-2009	Sep-2009												
Shunde Bridge	Also named Shouxi River No.3 Bridge: 100 meters long, 12 meters wide.	15,000	2,206	FFB	Central Village	May-2009	Nov-2009												
Sanshui Bridge	Also named Pandaer Bridge: 72 meters long, 10 meters wide.	7,100	1,044	FFB	Central Village	May-2009	Nov-2009												
Gaoming Bridge	Also named Ercungou Bridge: 31 meters long, 10 meters wide.	3,400	500	FFB	Central Village	May-2009	Nov-2009												

Source: (H. Liu, 2011, pp. 204-211).

Note: For the location of construction projects, "Shuimo" refers to the whole township area.

C.2 List of Projects Funded Yet Not Built by Foshan

Project name	Content	Budgeted investment		Source of funds	Location	Planned time	
		(thousand yuan)	(thousand dollars, approx)			Start	End
Topography measure and drawing	Topography maps for the 5.5 square kilometers area in Central Village of Shuimo	1,300	191	FFB	Central Village		
Post-quake housing quality assessment		1,500	221	FFB	Shuimo		
Compensation	For land acquisition for projects in first three phases	70,204	10,324	FFB	Shuimo		
Chanshou Old Street	Household reconstruction and renovation along the 1000 meter road: 270 households, total building area of about 20,000 square meters.	55,300	8,132	FFB	Laoren	Mar-2009	Oct-2009
	Preservation and Repair of Wanshou Tai	300	44	FFB	Laoren	Mar-2009	Oct-2009
	Radion and television service construction for one temporary residential community	200	29	FFB	Laoren	Mar-2009	Oct-2009
	Public bathrooms: Total building area of around 250 square meters.	250	37	FFB	Laoren	Mar-2009	Oct-2009
Maopingzi Water Plant	Activity Center for the elderly	300	44	FOC/ABFM	Laoren	Mar-2009	Oct-2009
	Repair of the old Maopingzi Water Plant, which now supplies water for the Central Village and has a capacity of 3,000 t/d.	3,500	515	FFB	Maopingzi		
Rural Drinking Water Project	Water supply project for 18 villages: 172 tanks (5,465 cubic meters), branch water separating pipes 83,570m, household connecting pipes 116,700m.	15,000	2,206	FFB	Shuimo		
Baiguoping Water Supply Project	Serve 390 villagers: 147 cubic meters of tank, PE pipes of 9,200m.	2,877	423	FFB	Baiguoping	Aug-2008	Sep-2009
Supporting funds	For housing, infrastructure, industries, tourism, etc.	35,600	5,235	FFB	Shuimo		
Shuimo Farmers' Market	Repair of the old Farmers' Market.	200	29	FFB	Central Village		
Public Facilities and Maintenance	Purchase of municipal facilities and maintenance fees.	2,000	294	FFB	Shuimo		

Villages' Health Care Stations	A total building area of 1,020 square meters.	1,275	188	FFB	Shuimo		
Public service space	building area 4380 square meters (excluding the 1020 square meters of Health Center in the first phase of projects) for all 18 administrative villages.	5,475	805	FFB	Shuimo		
Cultural Service Station at the temporary residential community	Building area 400 square meters.	46	7	FFB	Shuimo		
Radio and Television working space and facilities	A new radio and television branch: 1000 square meters of total area, with special facilities.	5,600	824	FFB	Shuimo		
Qiang Town	Two public bathrooms, total building area 500 square meters.	500	74	FFB	Laoren	Sep-2009	May-2010
Infrastructure recovery and repair	Recovery of roads between villages, amounting to 170 kilometers in total.	6,000	882	FFB	Central Village		
Green infrastructure as public space	Foyuan Road: 1,500m long, 3m wide. Greening and environmental restoration in Qiang Town	300	44	FFB	Lianshanpo	May-2010	Jun-2010
Shared housing for employees at Wenchuan No.2 Kindergarten	9 housing units for the 29 employees (serving 30% at a time), each with building area of 35 square meters. Total building area 315 square meters.	788	116	FFB	Shuimo		
Shared housing for employees at Shuimo Health Center	12 housing units for the 40 employees (serving 30% at a time), each with building area of 35 square meters. Total building area 420 square meters.	1,050	154	FFB	Shuimo		
Agricultural tourism development as a ring	Infrastructure Recovery in sevens: Xianfengyan, Huangbjaping, Lianshanpo, Dayandong, Majiaying, Zhaiziping, and Guojiaba.	23,500	3,456	FFB	Shuimo		
	Qiangxinju Housing Project: Landscape renovation for 123 households along Xuankou-Sanjiang Highway in Guojiaba	5,000	735	FFB, FOCABFM	Guojiaba	Mar-2009	May-2009
	Recovery of Aba Qiang bud Base: Expanding another 10000 Mu of tea planting area.	3,500	515	FFB	Lianshanpo and Dayandong	Feb-2009	May-2009
	Kiwi Planting base: around 1000 acres.	2,000	294	FFB	Shuimo		

	Assisting Chuanghui Eco-pig breeding in Niutanggou	1,000	147	FFB	Niutanggou	
Xuankou-Sanjiang Highway	Newly built length of 9 kilometers, 8.5 meters wide.	72,000	10,588	FFB	Shuimo	
	5,100m long, from Laoren to Huangjiayuan.	1,820	268	FFB	Shuimo	
Local roads between rural villages	2,500m long, from Anziping to Niutanggou.	2,000	294	FFB	Shuimo	
	3,600m long, from Hejiagou to Dengcaoping.	2,880	424	FFB	Shuimo	
	1,900m long, from Shuimo Bridge to Heitupo.	1,140	168	FFB	Shuimo	
	3,100m long, from Hejiagou to Gaofeng.	1,860	274	FFB	Shuimo	
	3,600m long, from Laoren to Liujiagou.	2,160	318	FFB	Shuimo	
	1,500m long, from Magnetic Plant to Xianfengyan.	950	140	FFB	Shuimo	
	3,000m long, from Laoren to Dacatou.	1,800	265	FFB	Shuimo	
	2,100m long, from the Port to Chenjiashan	1,260	185	FFB	Shuimo	
	900m long, from Dayandong to Lianshanpo.	990	146	FFB	Shuimo	
		Unexpected costs	36,971	5,437	FFB	Shuimo

Source: (H. Liu, 2011, pp. 204-211).

Note: For the location of construction projects, "Shuimo" refers to the whole township area.

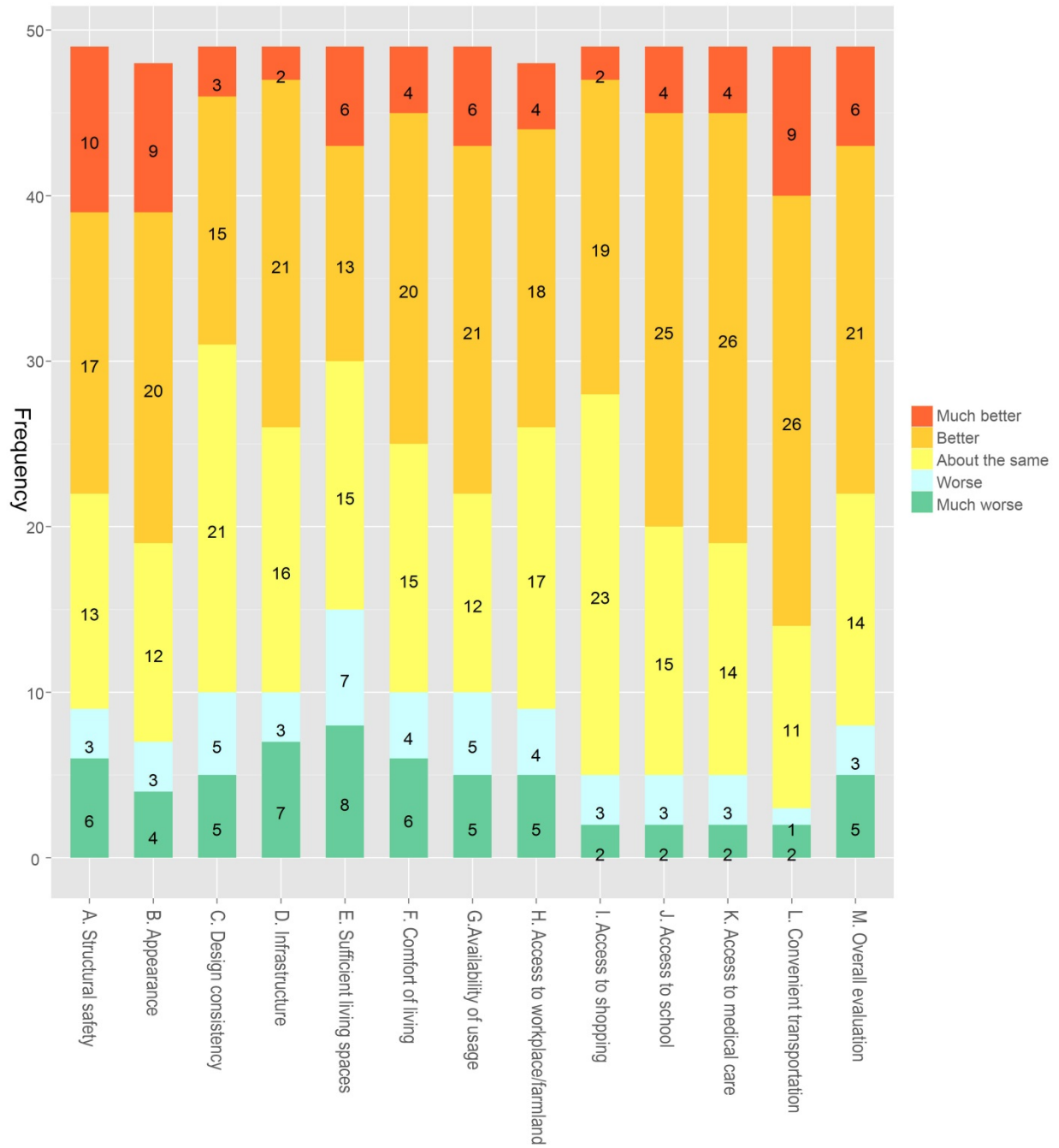
APPENDIX D: SELECTED RESULTS FROM THE HOUSEHOLD SURVEY

This appendix will present results from three survey questions regarding a variety of aspects in the post-recovery conditions compared to pre-quake conditions. The questions remain the same as in the actual survey, each followed by a summary figure.

D.1 Comparison of Residences

Q33. How would you rate your current residence in comparison with your residence before the earthquake?

- A. Structural safety*
- B. Appearance*
- C. Design consistent with local customs*
- D. Infrastructure (electricity, drainage, sewerage)*
- E. Sufficient living spaces*
- F. Comfort of living*
- G. Availability of usage*
- H. Access to workplace/farmland*
- I. Access to shopping*
- J. Access to school*
- K. Access to medical care*
- L. Convenient transportation*
- M. Overall evaluation*

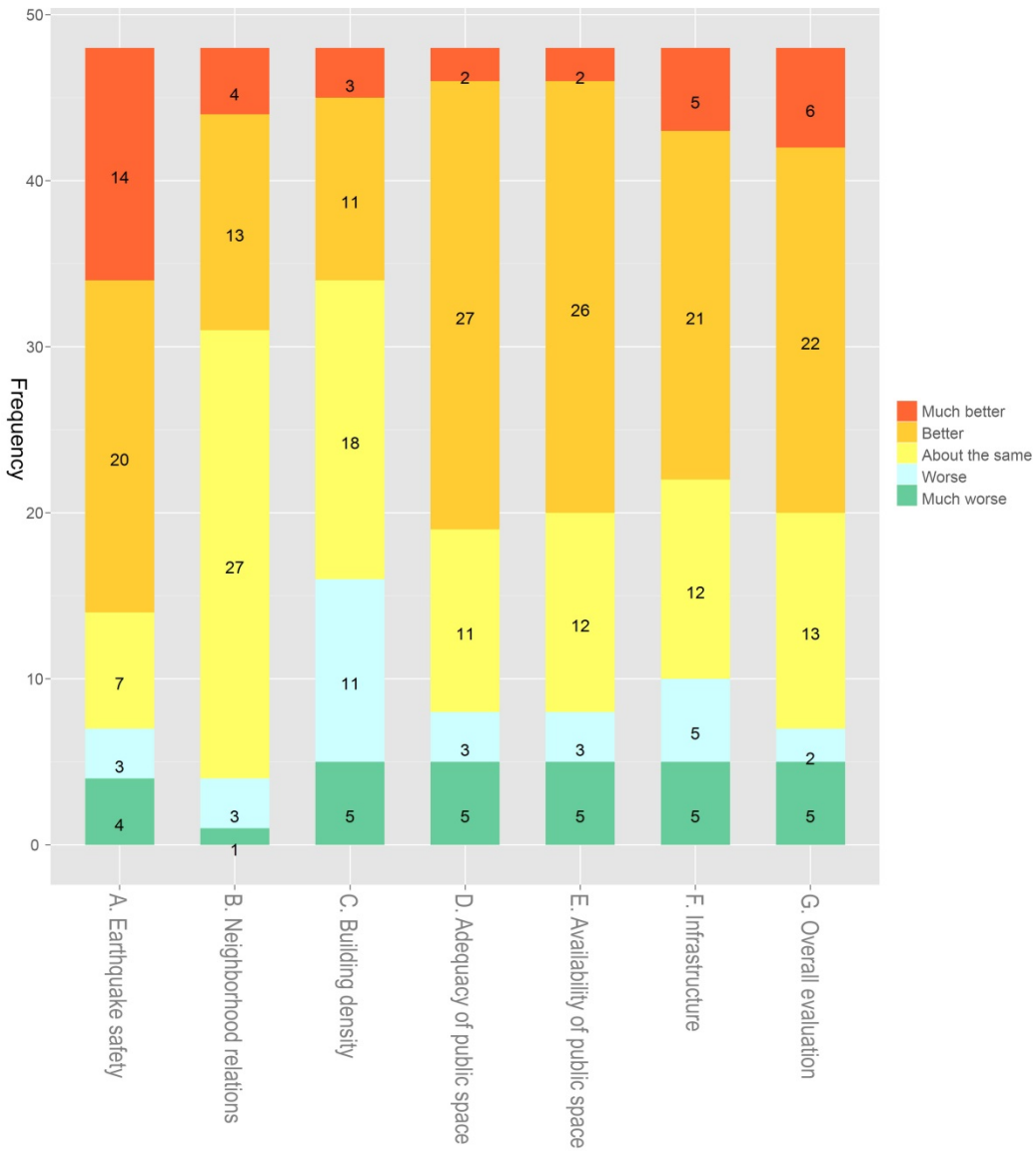


Summary of Q33

D.2 Comparison of Neighborhoods

34. How would you rate your current neighborhood in comparison with the one you lived before the earthquake?

- A. Earthquake safety
- B. Neighborhood relations
- C. Building density
- D. Adequacy of public space
- E. Availability of public space
- F. Infrastructure (electricity, drainage, sewerage)
- G. Overall evaluation

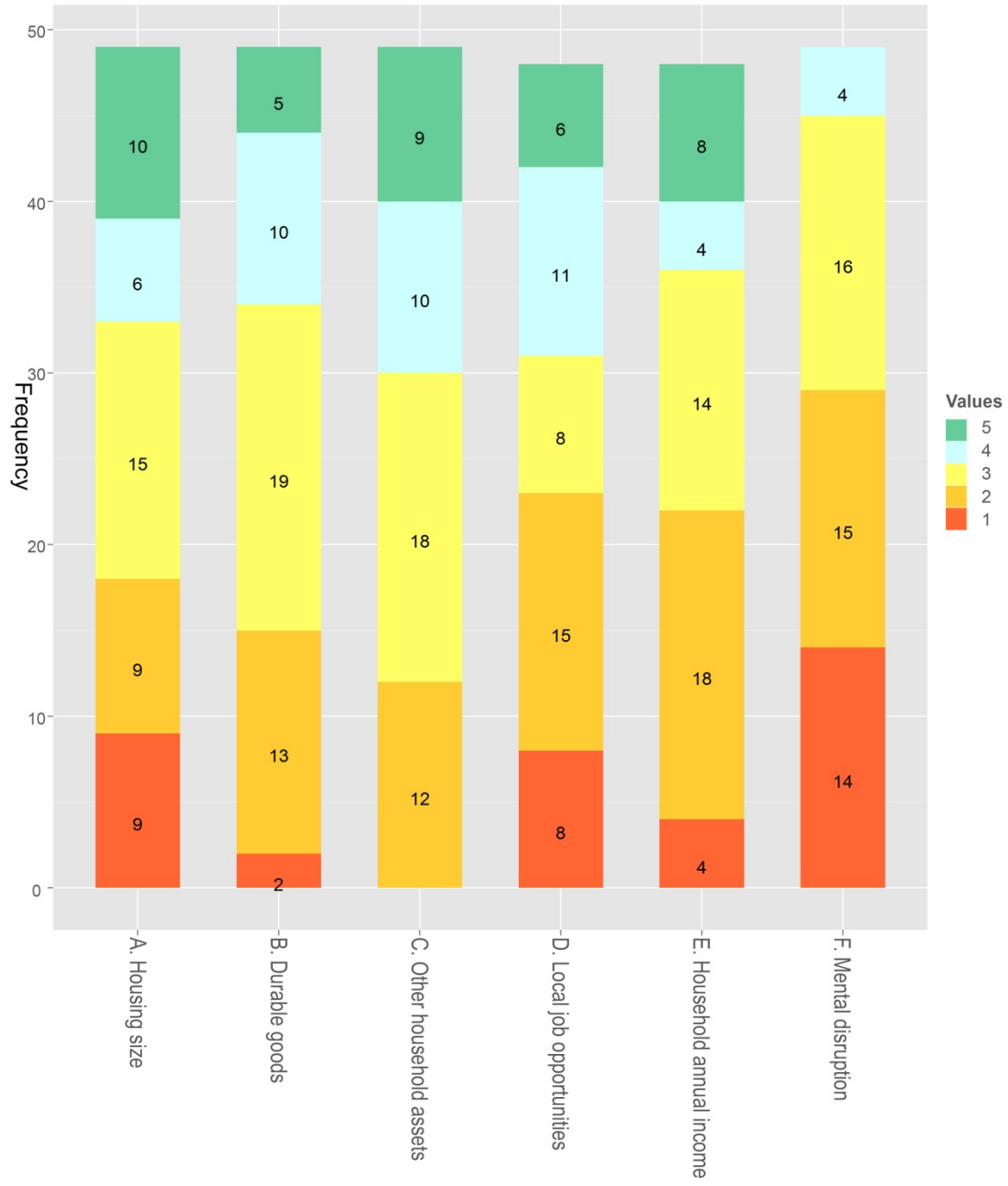


Summary of Q34

D.3 Comparison of Household Conditions

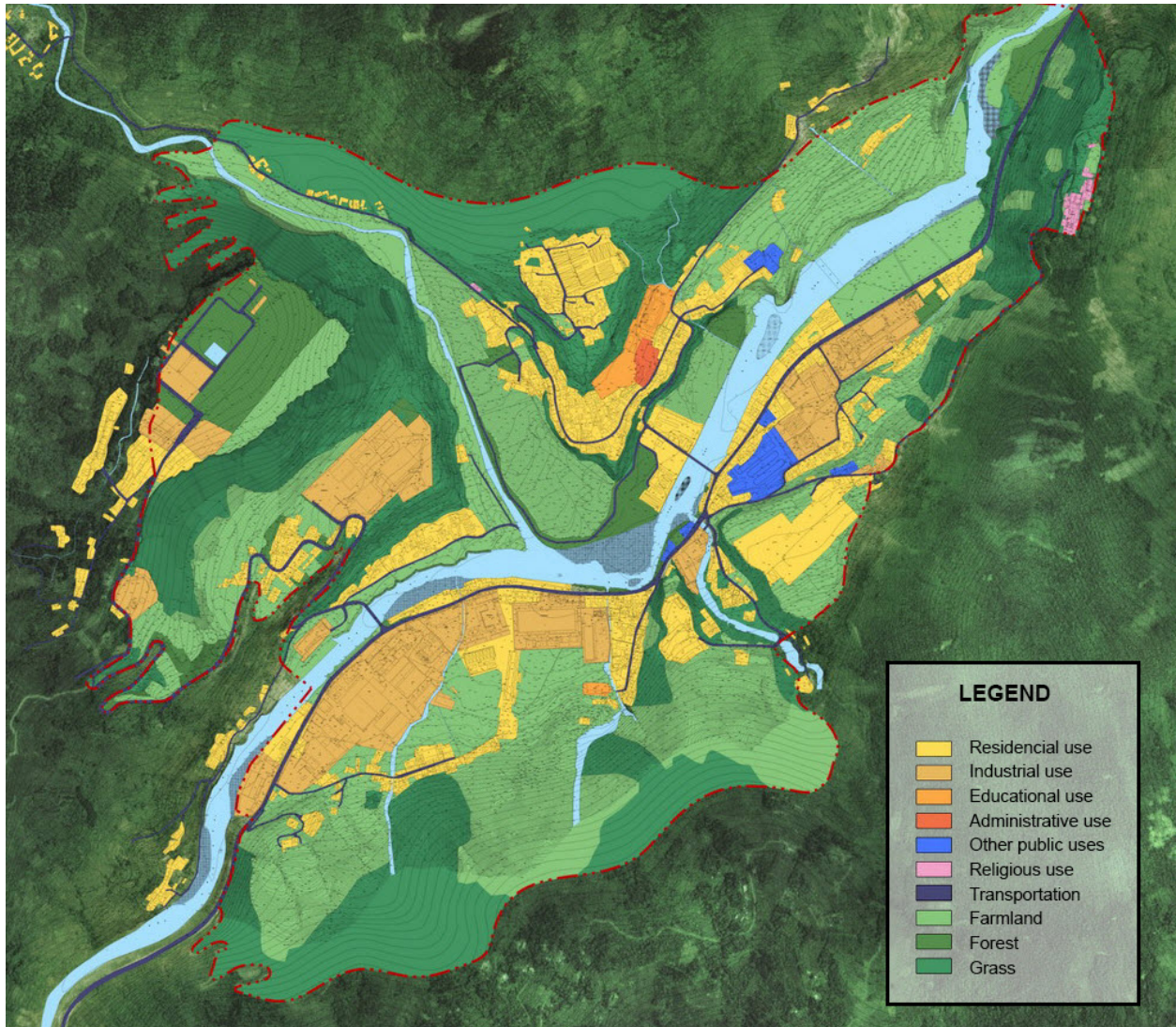
39. To be specific, how are the following aspects in your household now compared with the conditions before the earthquake?

A. Housing size	
Much bigger	1
Bigger	2
Almost the same	3
Smaller	4
Much smaller.....	5
B. Durable goods (applicances, furniture, etc.)	
Much more	1
More	2
Almost the same	3
Less	4
Much less.....	5
C. Other household assets	
Much more	1
More	2
Almost the same	3
Less	4
Much less.....	5
D. Local job opportunities	
Much more	1
More	2
Almost the same	3
Fewer	4
Much fewer.....	5
E. Household annual income	
Much more	1
More	2
Almost the same	3
Less	4
Much less.....	5
F. Mental disruption caused by the quake	
Wholly recovered	1
Recovered to a great extent	2
Recovered to some extent.....	3
Not at all.....	4



Summary of Q39

APPENDIX E: LAND USE CONDITIONS OF THE PRE-QUAKE SHUIMO



Source: (Foshan Assistance Group & Peking University Institute of Urban Design).

Note: Only the land use conditions in the Central Village are displayed here.

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