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Kristin Dalen, Jing Liu and Jon Pedersen

Reconstructing a future: Ten years after the Wenchuan earthquake

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Foreword

A Chinese saying goes: Never forget why you started, and your mission can be accomplished. Therefore, now as the fieldwork and reporting of "Reconstructing a future: Ten years after the Wenchuan earthquake" has been accomplished, it may be good to consider why we started.

In June 2008, one month after the great Wenchuan earthquake, a joint team consisted of CASTED and Fafo researchers started the first large-scale implementation of a policy-oriented post disaster rapid needs assessment in the area hit by the earthquake. The study covered 4 000 randomly sampled households in 26 seriously damaged counties. In the following years of 2009 and 2011, two follow-up surveys were conducted in the same area with the same sample size to track the reconstruction process. The surveys collected solid data to support the post-disaster reconstruction policy making, and were greatly appreciated by policy makers and researchers.

In 2017, facing the ten years anniversary of the earthquake, researchers from CASTED, Fafo, and Beijing Normal University proposed to conduct the fourth round of longitudinal surveys in 2018 to systematically sum up the experiences and lessons learned from the ten-year reconstruction.

The proposal was well received by the Chinese government and the Norwegian embassy in China. The Ministry of Science and Technology in China provided administrative and financial support for the survey, and the Norwegian embassy provided the main funding.

The survey was conducted in January and February in 2018. The Bureau of Science and Technology in Sichuan Province and the Sichuan Research Center for Science and Technology for Development took the responsibility of contacting local authorities in the sampled villages/communities. Around 150 teachers and students in Southwest Jiaotong University conducted sampling and interviewing fieldwork.

As experienced in all the survey projects we have conducted together, many unexpected problems and challenges kept emerging. And again as witnessed before, we managed to solve all the problems together. The experiences include strong governmental support, efficient mobilization of resources, centralized decision making plus wide engagement, enthusiasm supported by professionalism and coordination based on mutual trust. In this sense, the accomplishment of the project is a perfect example of Sino-Norwegian research cooperation, and of a combination of Socialism with Chinese characteristics and the Nordic Model.

May 2018
Zhao Yandong
Director of the Institute of Science, Technology and Society
Chinese Academy of Science and Technology for Development

Summary

In the immediate aftermath of the Wenchuan earthquake, the people, central and local government rapidly started massive reconstruction efforts to rebuild communities, homes and lives. Even though many wounds cannot be healed and time cannot be turned back Sichuan has reemerged, through reconstruction and through development.

A joint research team of Chinese Academy for Science and Technology for Development (CASTED) and Fafo conducted a face-to-face household survey immediately after the earthquake. The survey was repeated one year, three years and ten years after the disaster. The four rounds of survey provide unique data about the transformation of the earthquake-stricken area over a decade: from destruction to reconstruction and on to further socio-economic development.

The area devastated by the earthquake was nearly completely rebuilt after two years, particularly with regards to housing and infrastructure. Trust in the institutions of society remains high, and there is little to suggest massive discontent with the reconstruction efforts. The forms of economic activities have dramatically changed in rural areas, and migration appears widespread.

People's participation in the labor market has dropped in rural areas and particularly among women. Nevertheless, unemployment has stayed low in the area. As a backward area in Sichuan, the wages in the earthquake-affected area were rapidly falling behind other parts of Sichuan when the earthquake struck. However, after the earthquake, the growth rate in wages in the area caught up to nearly the level of all of Sichuan, although the absolute difference increased.

Schools and health services were rebuilt in the new communities and coverage of health insurance has greatly improved. The major improvements in public services were accompanied by new challenges: for example, schools were too far away from people's homes and many young children had to attend boarding schools; education related costs and health costs were still a major concern to people.

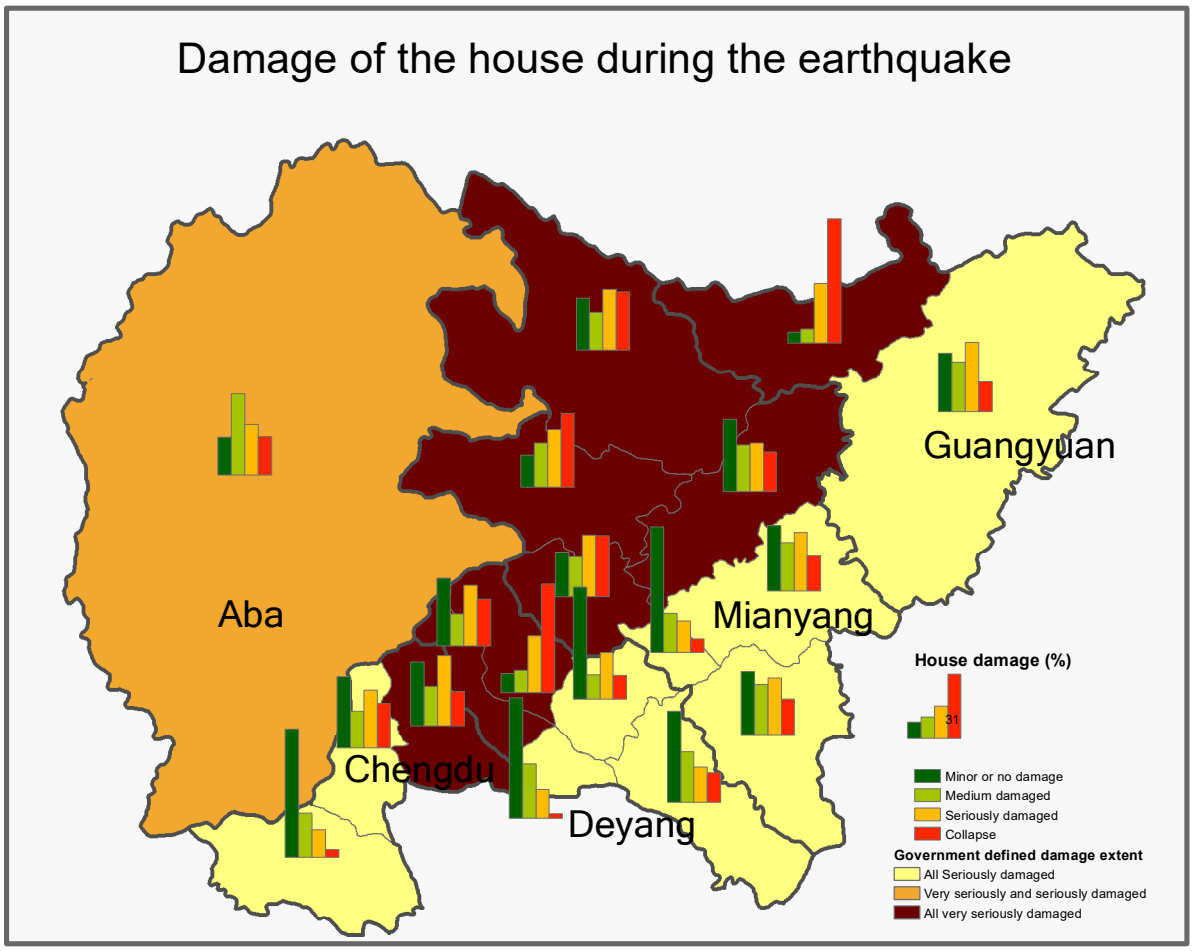
The reconstruction effort of the Chinese government after the Wenchuan earthquake has been successful in rebuilding rapidly. Many of the aims set in the overall reconstruction plan in terms of material well-being and increased income have been achieved. Some of the reconstruction policies implemented by the Chinese government were unique and proved to be successful. Whether Chinese experiences and success in disaster recovery after Wenchuan earthquake is unique to the Chinese context or can be implemented by other countries and regions should be explored.

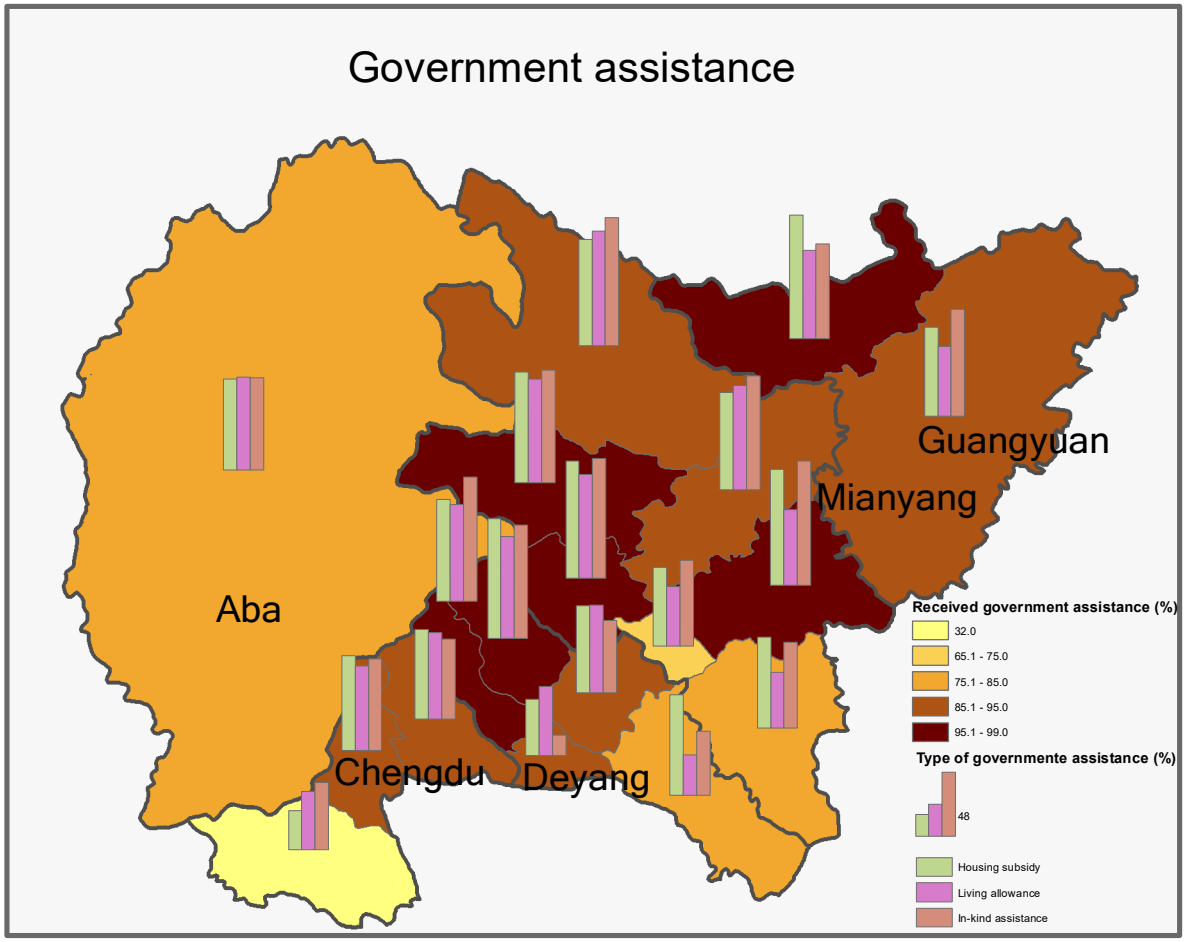
Over the last ten years all of China has experienced dramatic changes and economic transformations. The living conditions and economic development in the earthquake affected area have generally followed the overall development trend of the rest of the country. After experiencing a devastating earthquake, the area has recovered quickly and returned to a normal track of development. While the reconstruction plan aimed for an unleashing of innovation in the economy and society, there are few signs of reconstruction efforts having led to new modes of growth in the area. The area has followed a rather similar trend of development as the country as a whole. Moreover, the challenges faced by those who experiences the earthquake in 2008 are many of the same as for the rest of the Chinese population. .

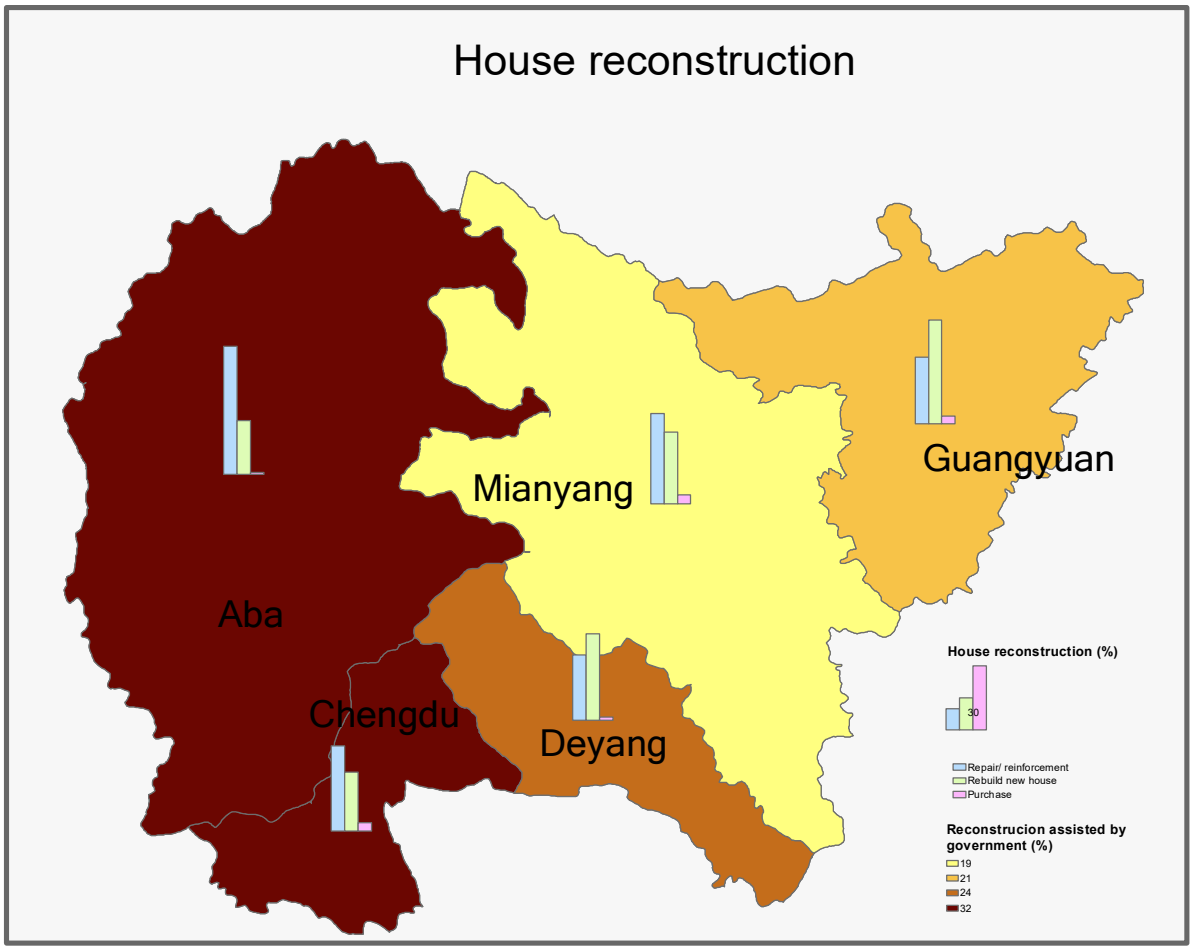
It is difficult to tease out whether the development in the earthquake affected area was directly caused by the earthquake and reconstruction or by the general developments of China's economy and society. Nevertheless, the present report is a starting point for that discussion.

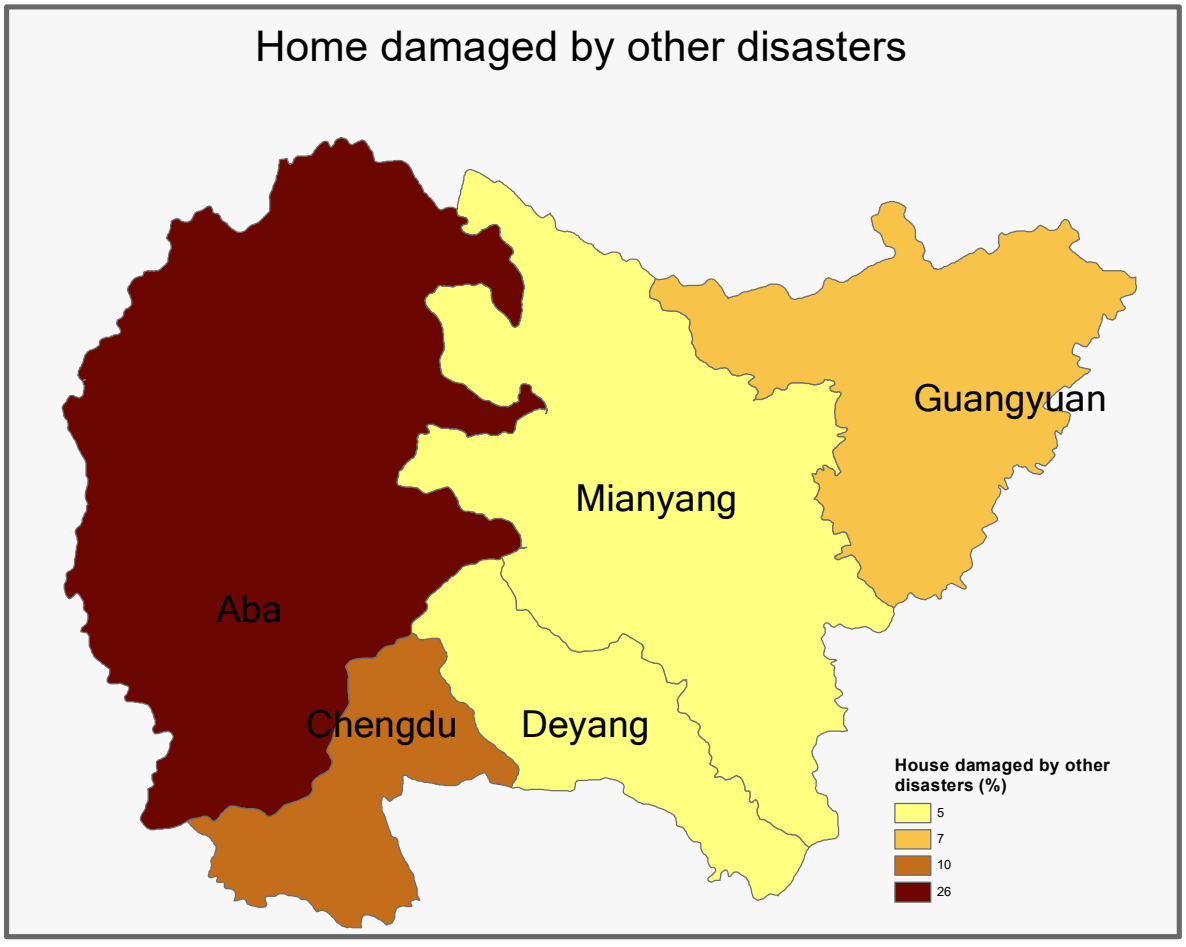
Districts and counties represented in the surveys

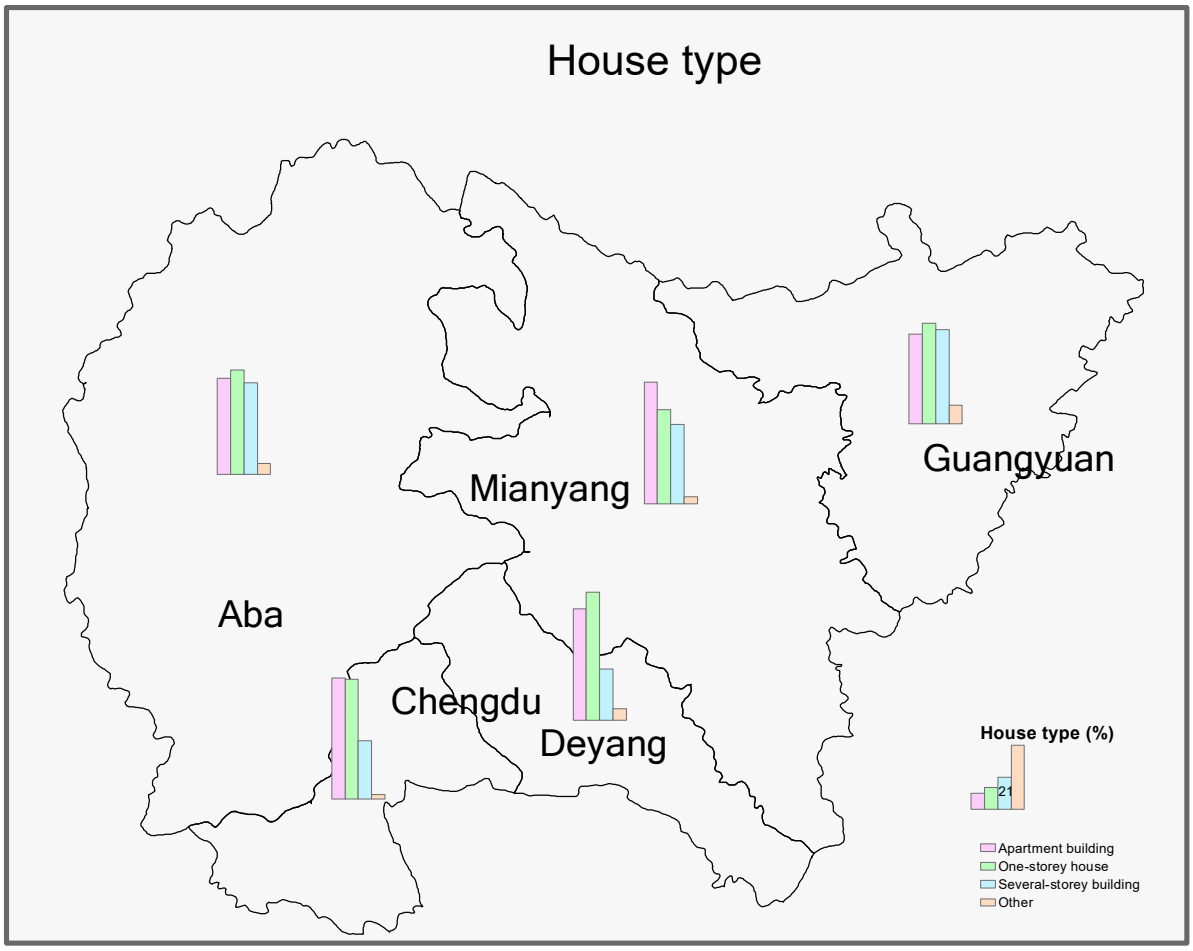
Note that for mapping purposes some counties were merged so that each resulting geographic unit would have a sample of at least 100 households. The names of all counties covered are on the map

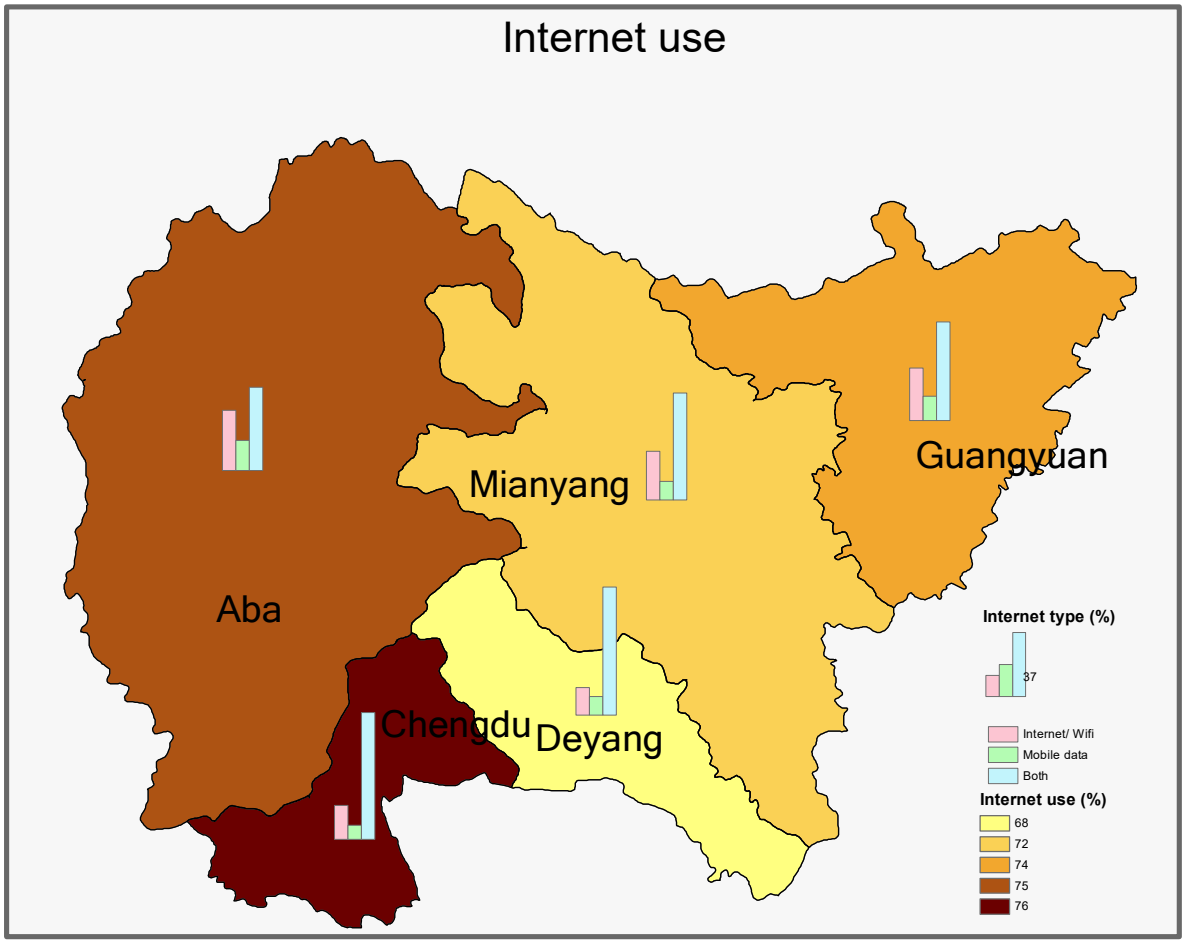

Damage of the house during the earthquake
Guangyuan
Aba
Mianyang
Chengdu
Deyang
House damage (%)
31
Minor or no damage
Medium damaged
Seriously damaged
Collapse
Government defined damage extent
All Seriously damaged
Very seriously and seriously damaged
All very seriously damaged

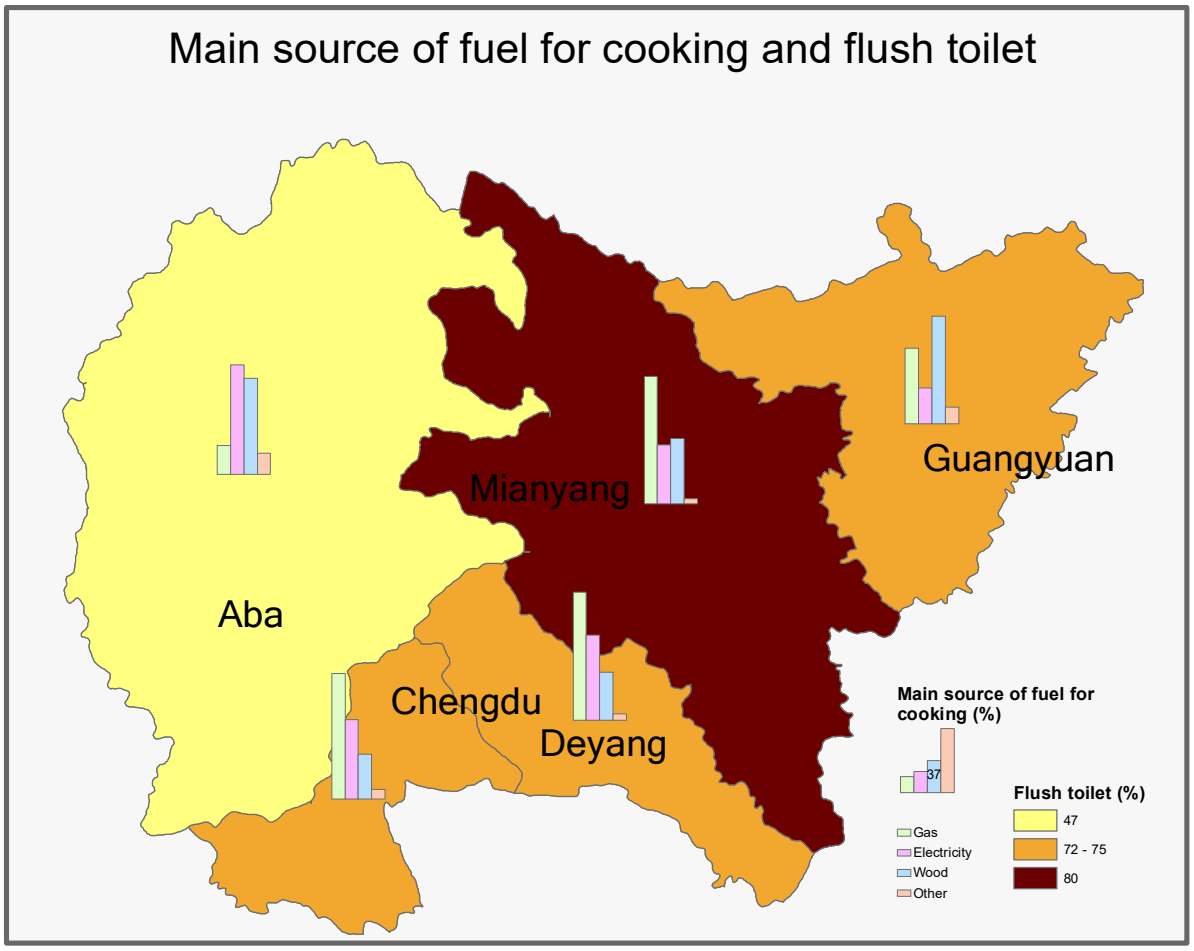

Government assistance
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Received government assistance (%)
32.0
65.1 - 75.0
75.1 - 85.0
85.1 - 95.0
95.1 - 99.0
Type of governmente assistance (%)
48
Housing subsidy
Living allowance
In-kind assistance

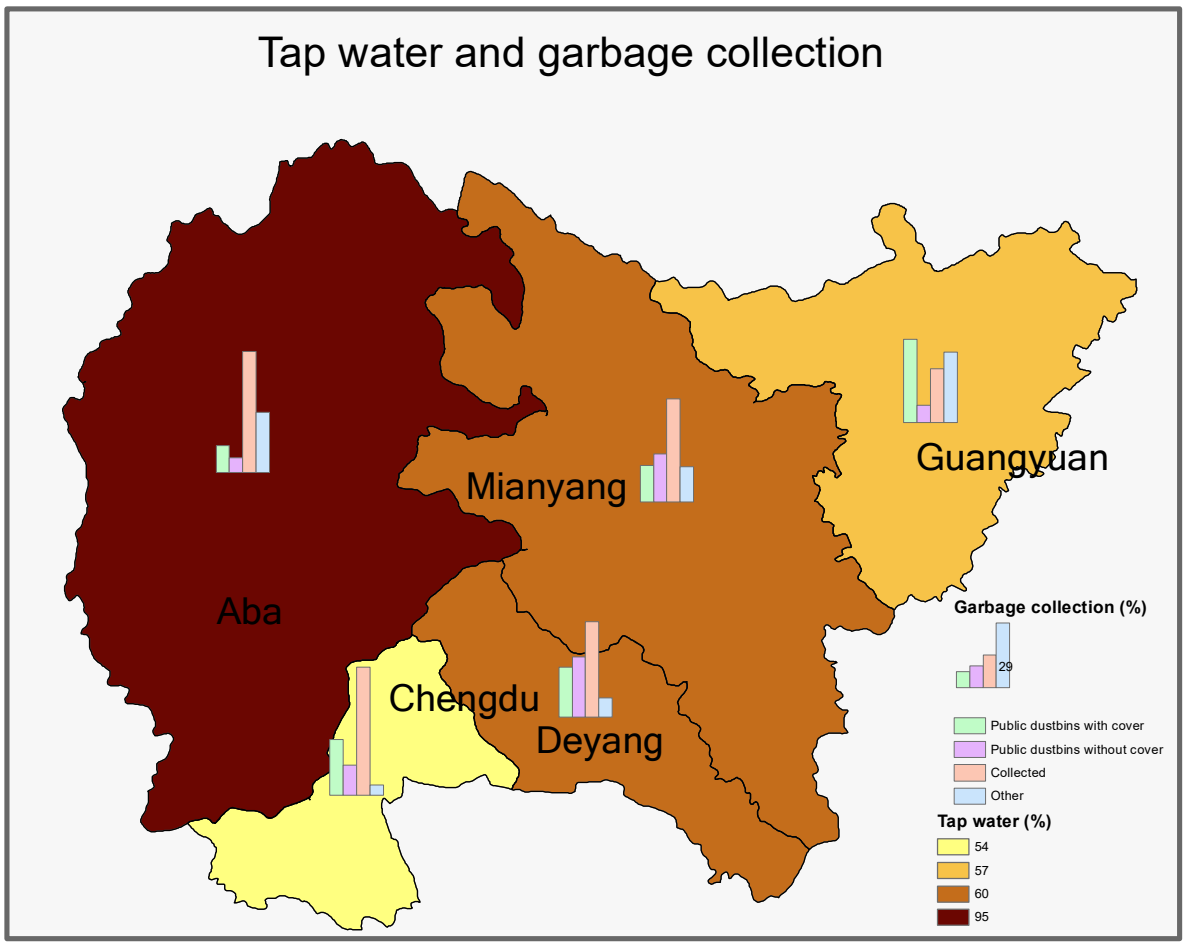

House reconstruction
Mianyang
Guangyuan
Aba
Chengdu
Deyang
House reconstruction (%)
30
Repair/ reinforcement
Rebuild new house
Purchase
Reconstrucion assisted by government (%)
19
21
24
32

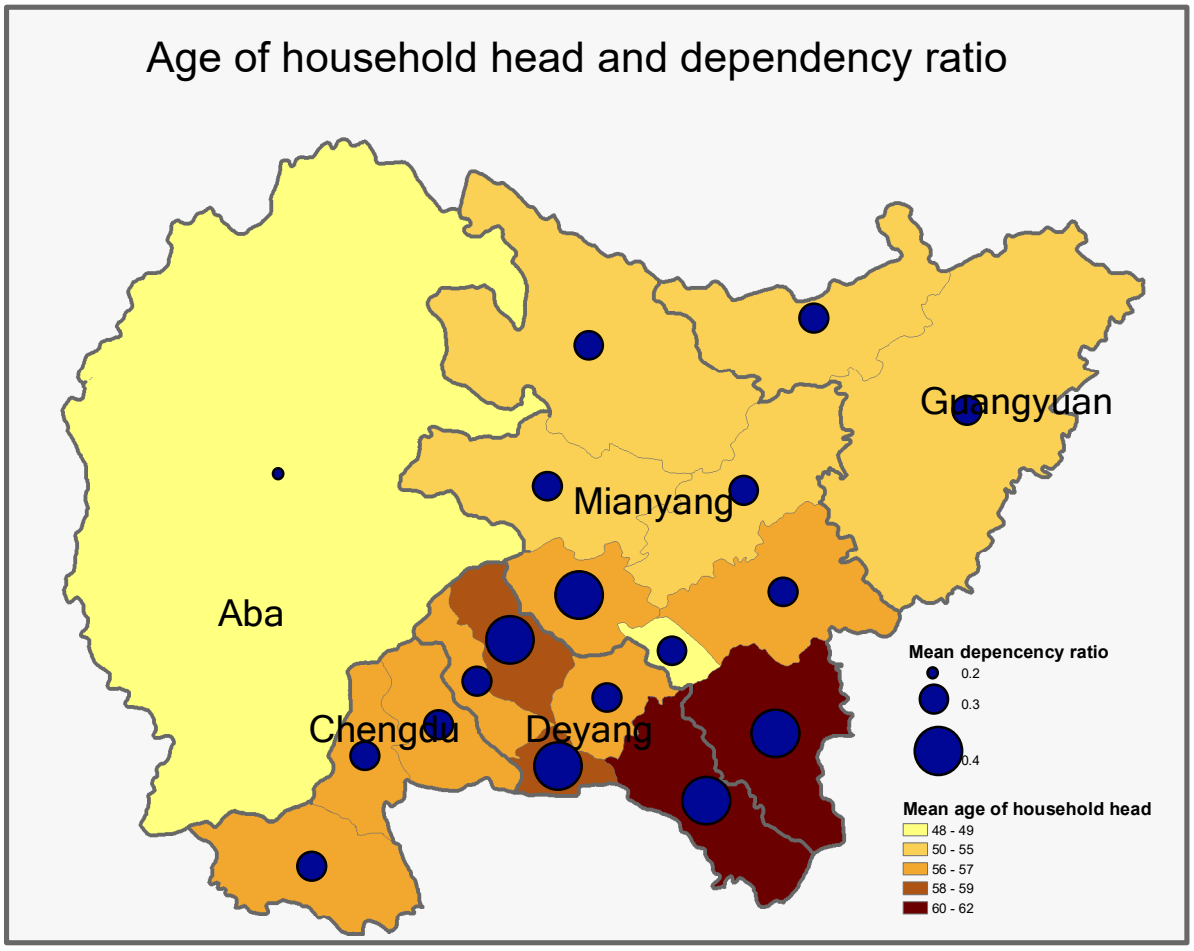

Home damaged by other disasters
Guangyuan
Mianyang
Aba
Chengdu
Deyang
House damaged by other disasters (%)
5
7
10
26

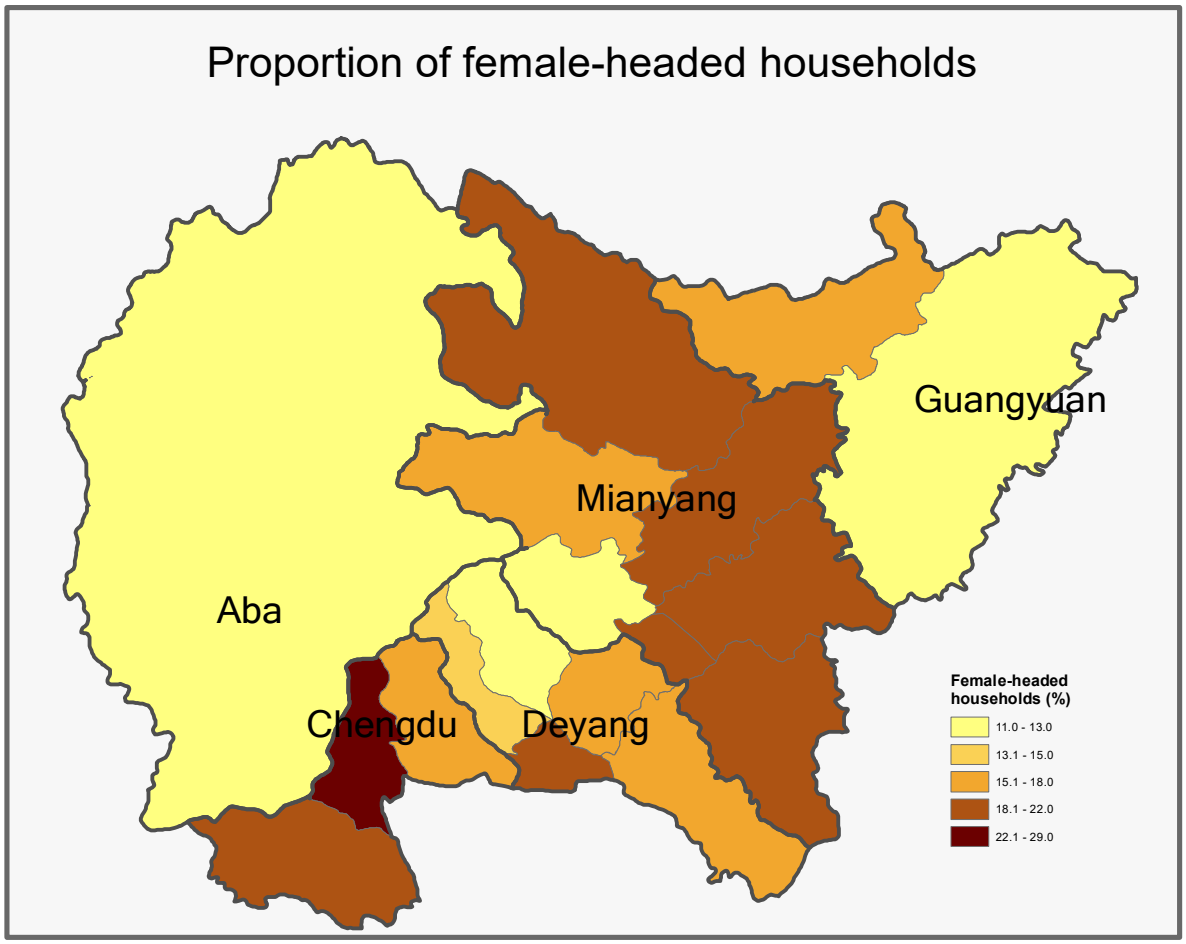

House type
Mianyang
Guangyuan
Aba
Chengdu
Deyang
House type (%)
21
Apartment building
One-storey house
Several-storey building
Other

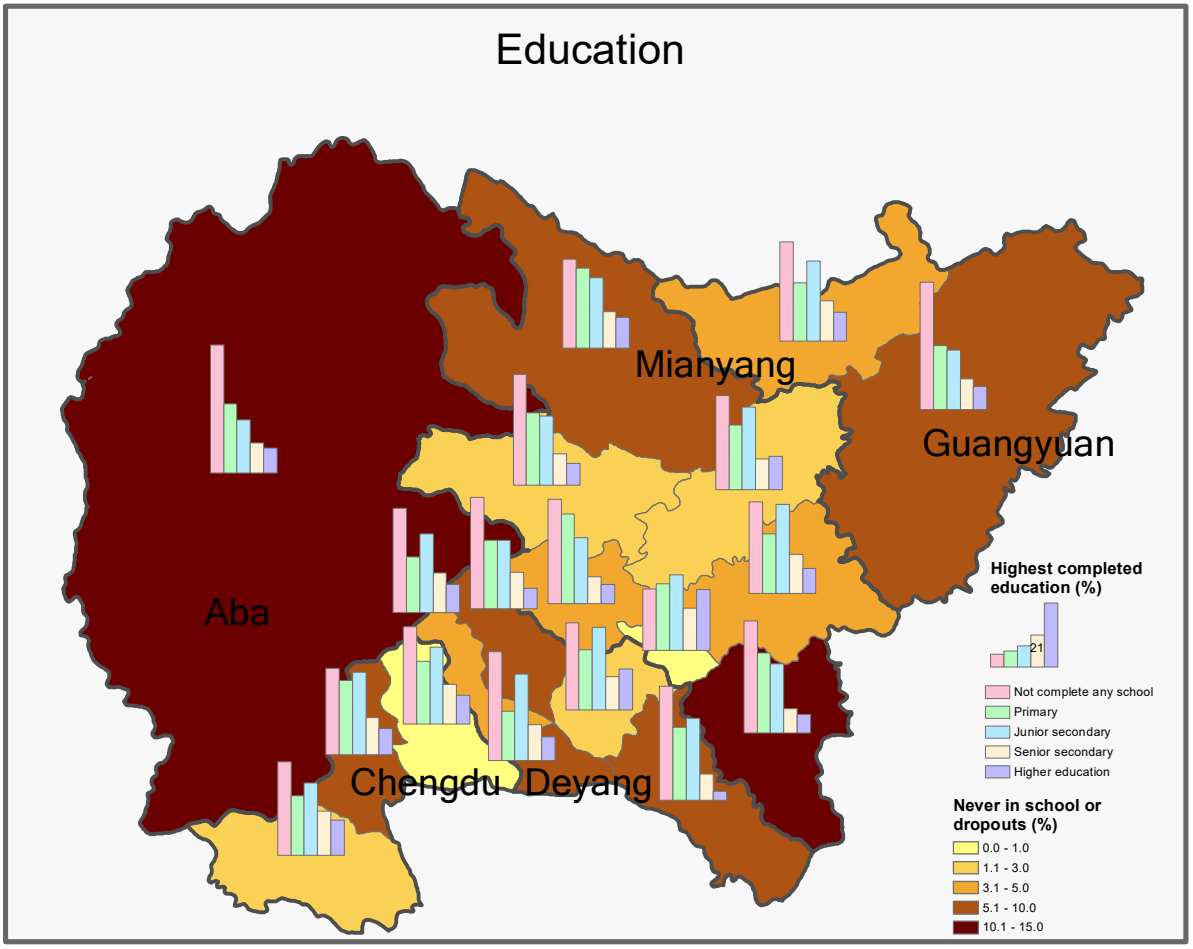

Internet use
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Internet type (%)
37
Internet/ Wifi
Mobile data
Both
Internet use (%)
68
72
74
75
76

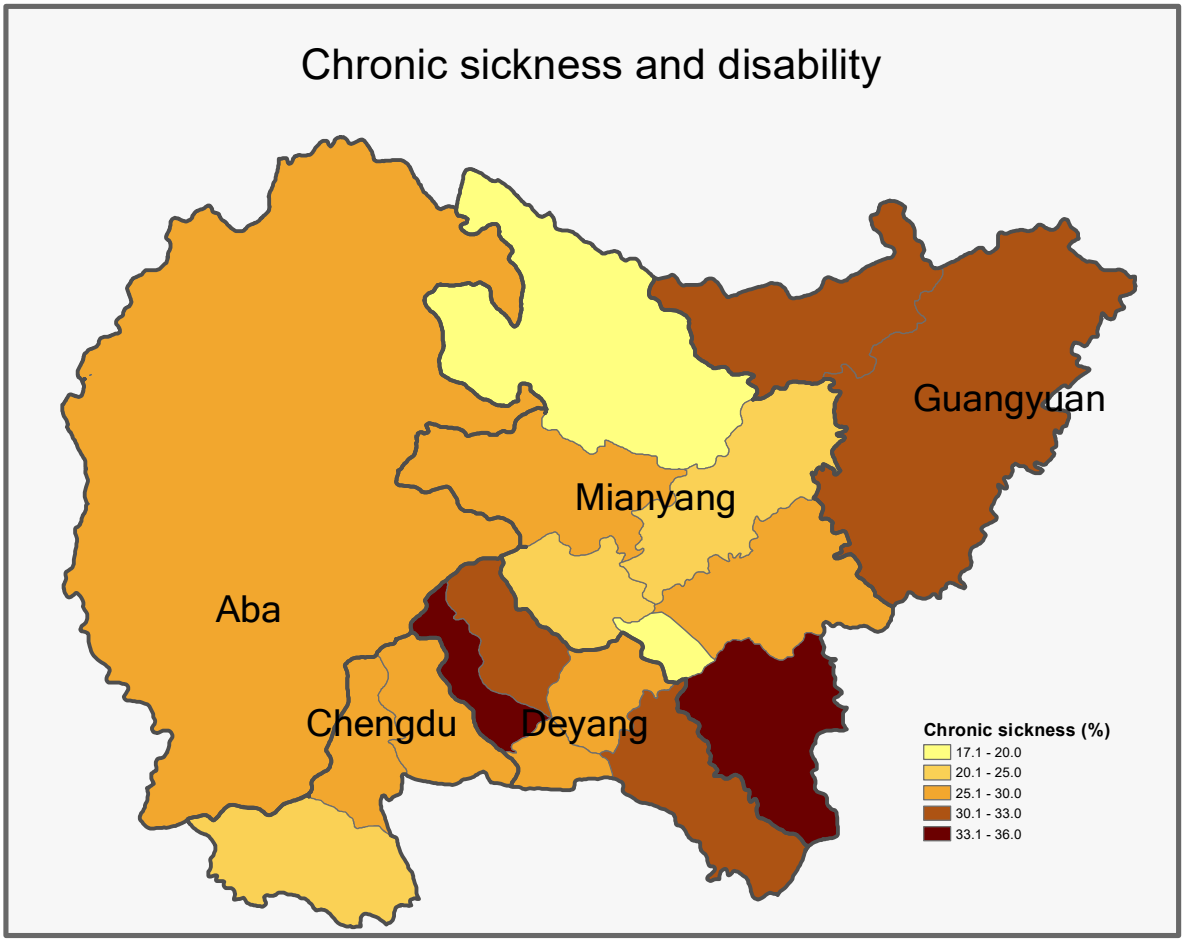

Main source of fuel for cooking and flush toilet
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Main source of fuel for cooking (%)
37
Gas
Electricity
Wood
Other
Flush toilet (%)
47
72 - 75
80

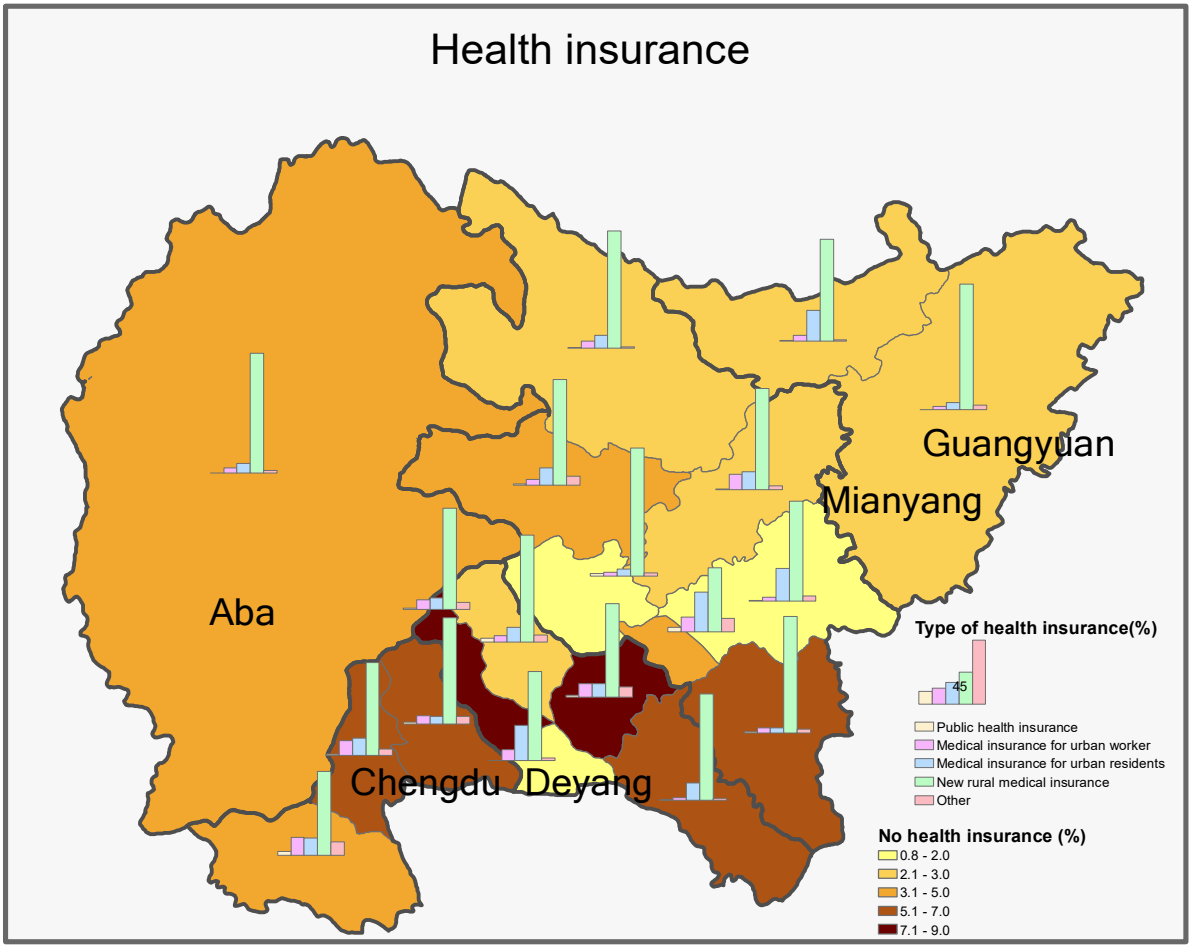

Tap water and garbage collection
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Garbage collection (%)
29
Public dustbins with cover
Public dustbins without cover
Collected
Other
Tap water (%)
54
57
60
95

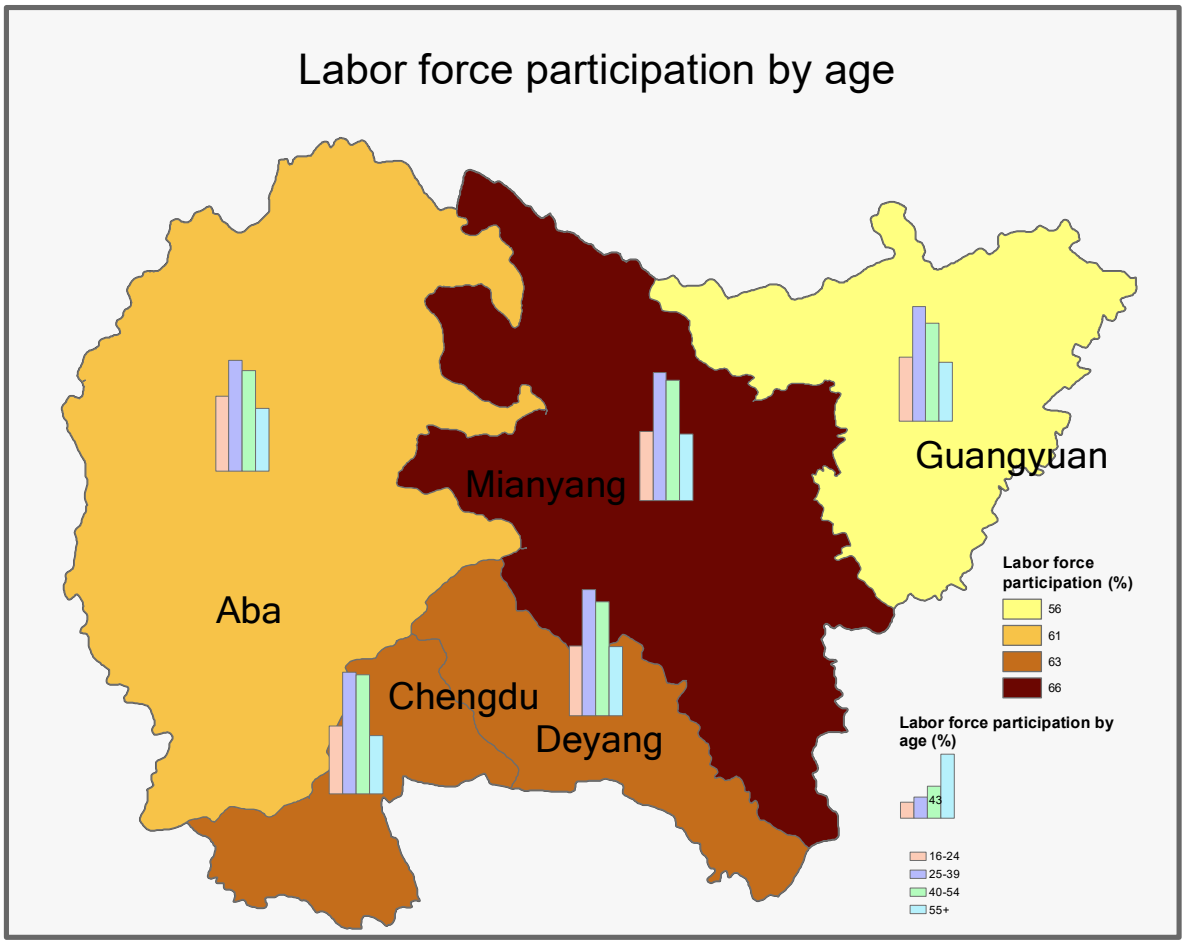

Age of household head and dependency ratio
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Mean depencency ratio
0.2
0.3
0.4
Mean age of household head
48 - 49
50 - 55
56 - 57
58 - 59
60 - 62

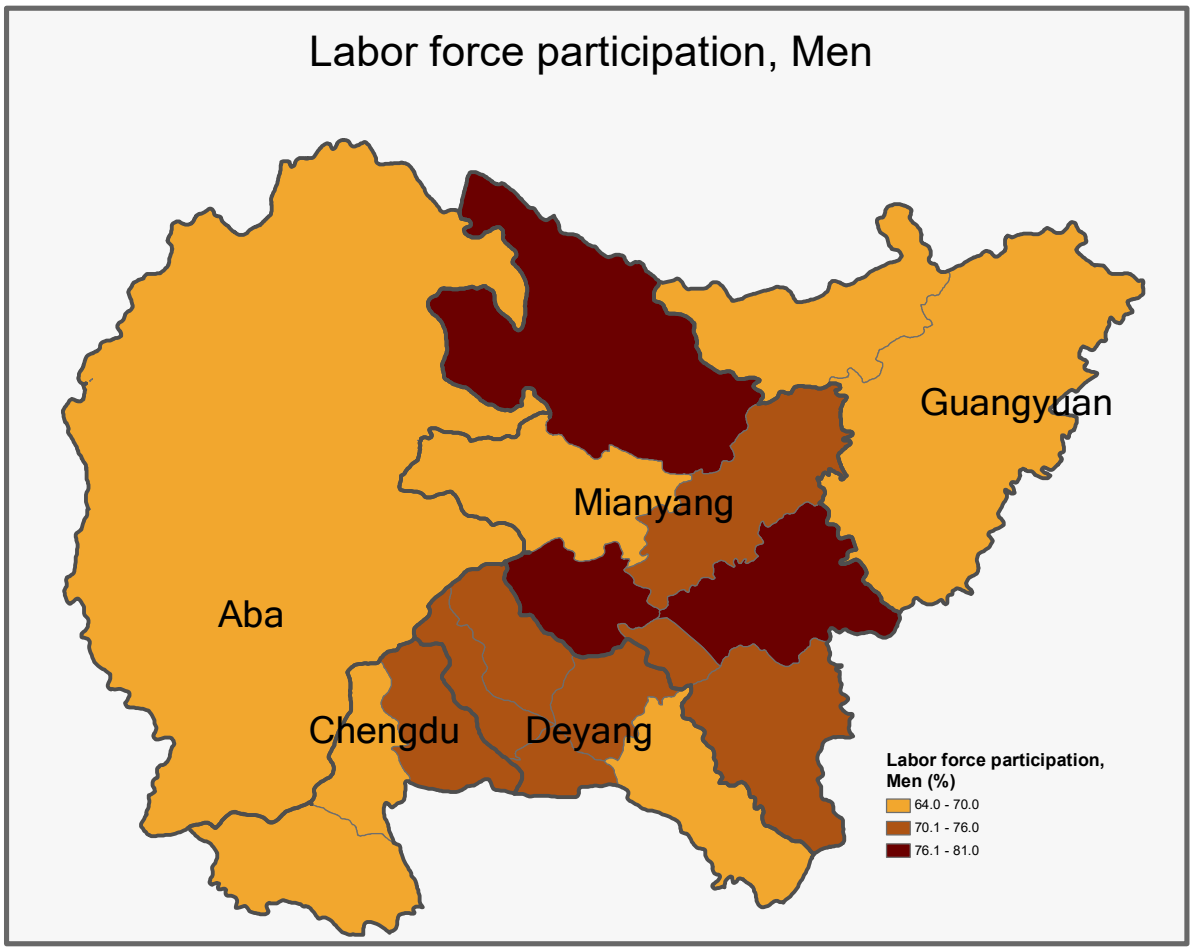

Proportion of female-headed households
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Female-headed households (%)
11.0 - 13.0
13.1 - 15.0
15.1 - 18.0
18.1 - 22.0
22.1 - 29.0

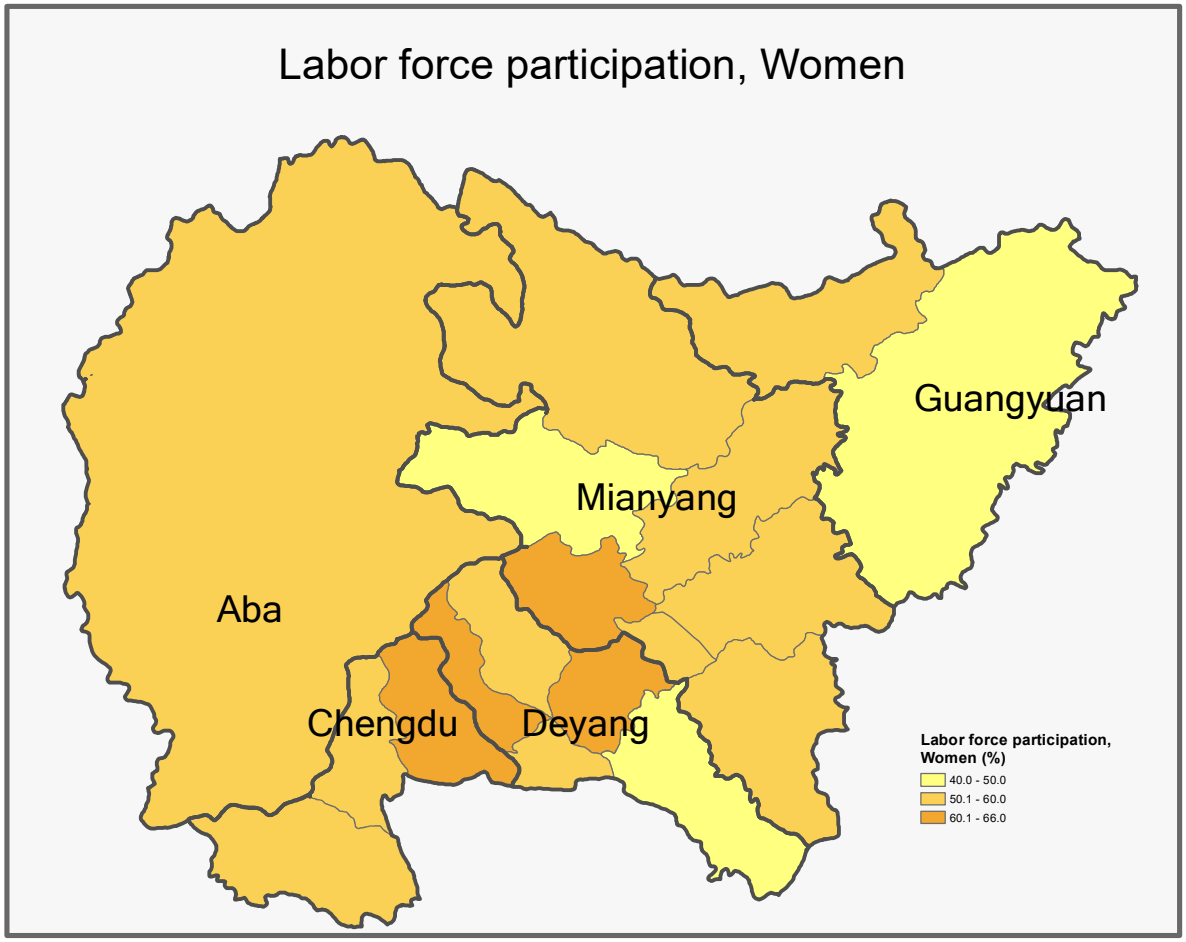

Education
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Highest completed education (%)
21
Not complete any school
Primary
Junior secondary
Senior secondary
Higher education
Never in school or dropouts (%)
0.0 - 1.0
1.1 - 3.0
3.1 - 5.0
5.1 - 10.0
10.1 - 15.0

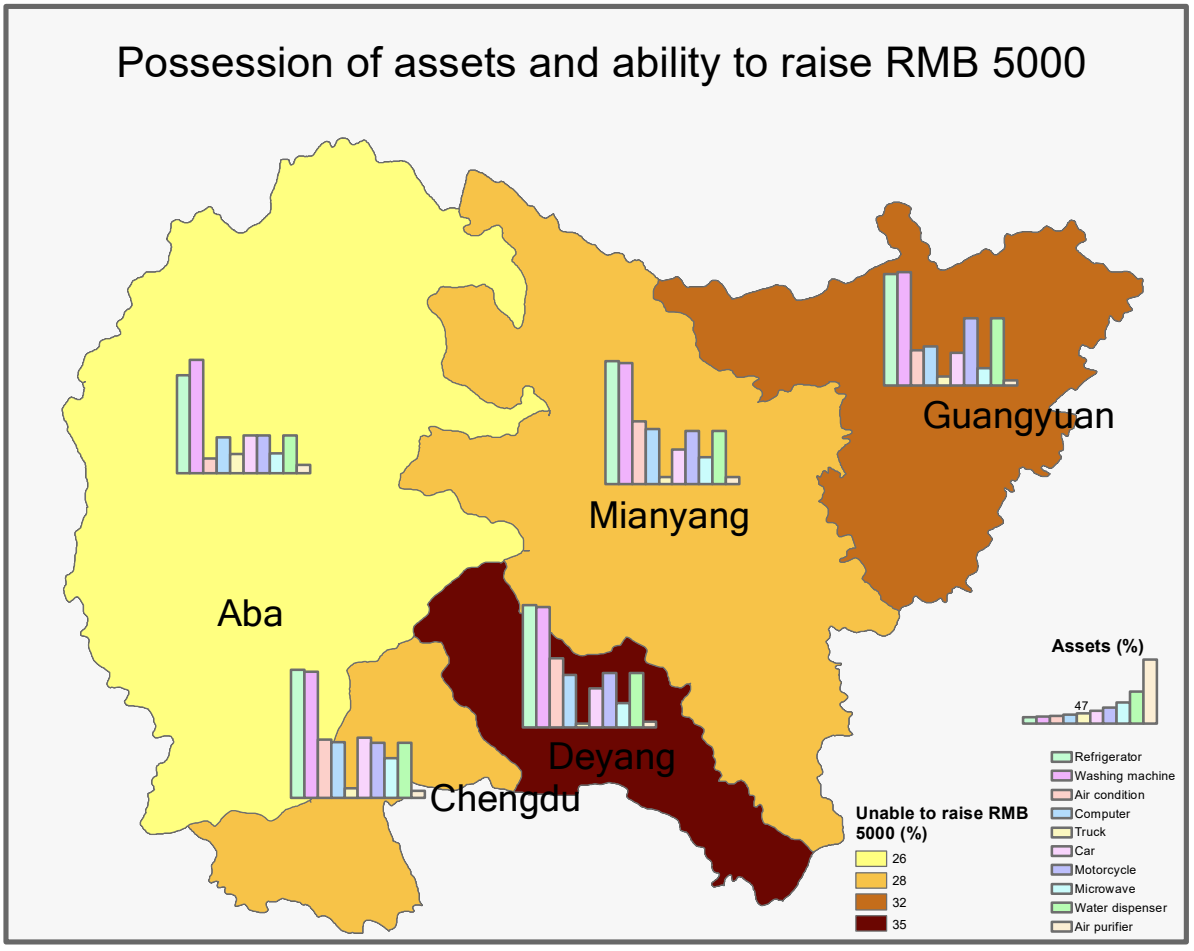

Chronic sickness and disability
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Chronic sickness (%)
17.1 - 20.0
20.1 - 25.0
25.1 - 30.0
30.1 - 33.0
33.1 - 36.0

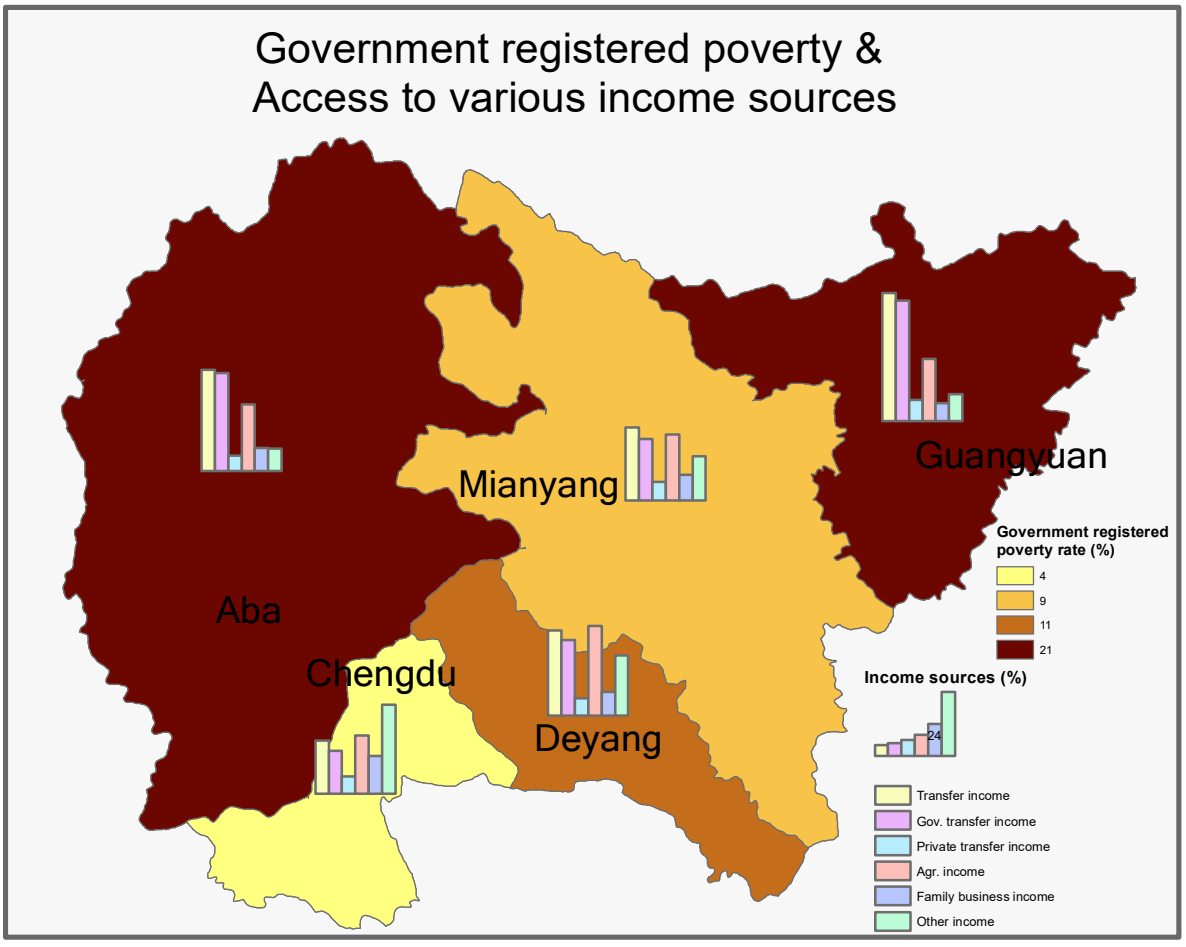

Health insurance
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Type of health insurance(%)
45
Public health insurance
Medical insurance for urban worker
Medical insurance for urban residents
New rural medical insurance
Other
No health insurance (%)
0.8 - 2.0
2.1 - 3.0
3.1 - 5.0
5.1 - 7.0
7.1 - 9.0

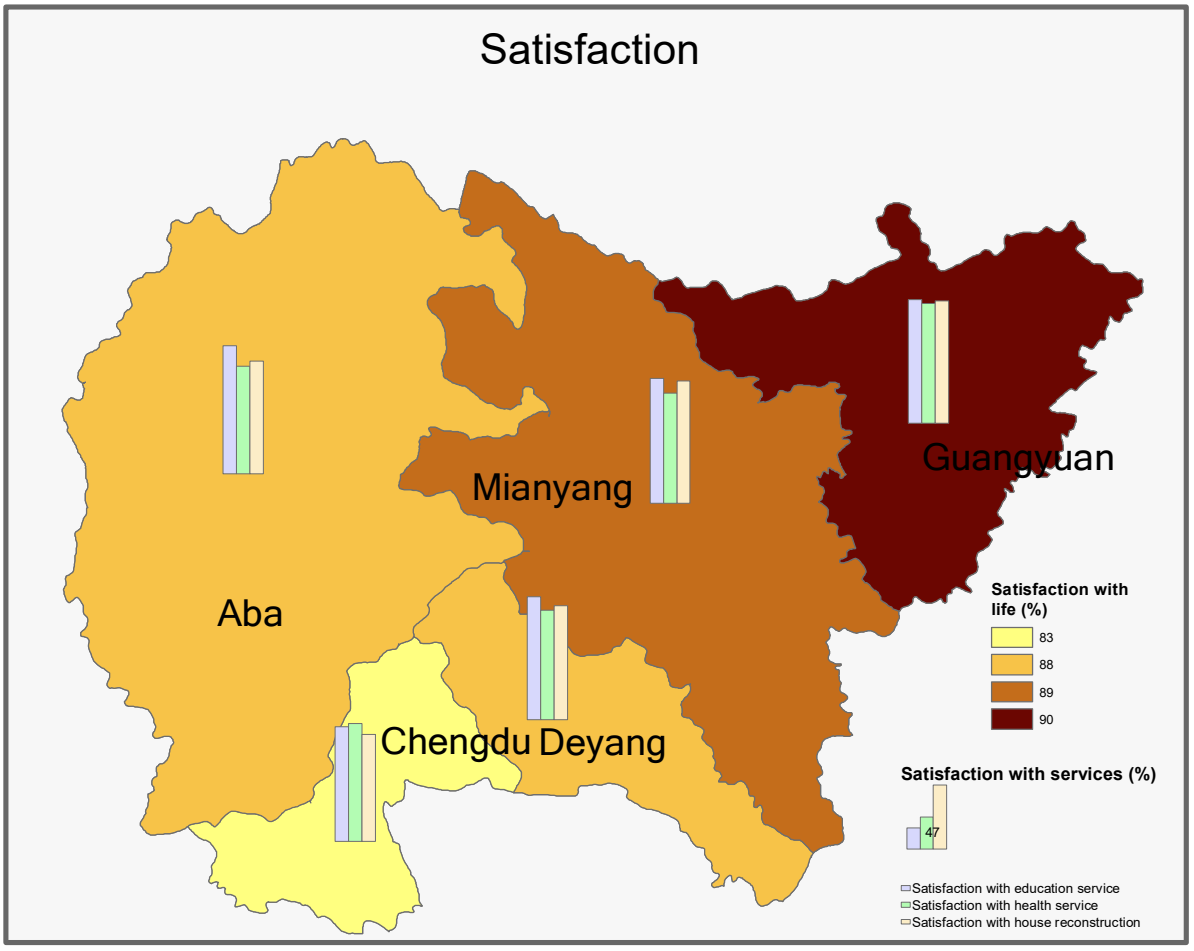

Labor force participation by age
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Labor force participation (%)
56
61
63
66
Labor force participation by age (%)
43
16-24
25-39
40-54
55+

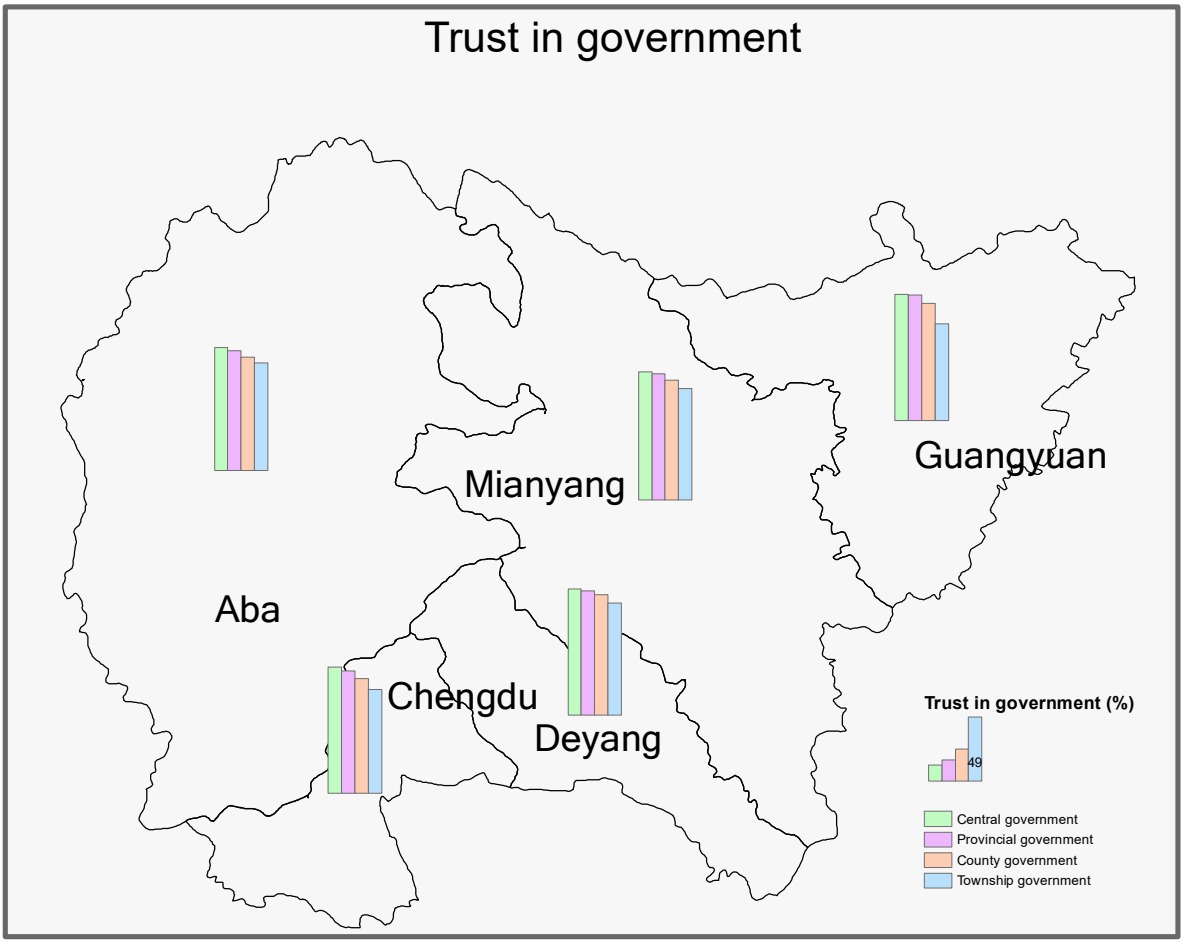

Labor force participation, Men
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Labor force participation, Men (%)
64.0 - 70.0
70.1 - 76.0
76.1 - 81.0


Labor force participation, Women
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Labor force participation, Women (%)
40.0 - 50.0
50.1 - 60.0
60.1 - 66.0


Possession of assets and ability to raise RMB 5000
Guangyuan
Mianyang
Aba
Deyang
Chengdu
Assets (%)
47
Refrigerator
Washing machine
Air condition
Computer
Truck
Car
Motorcycle
Microwave
Water dispenser
Air purifier
Unable to raise RMB 5000 (%)
26
28
32
35


Government registered poverty &
Access to various income sources
Guangyuan
Mianyang
Aba
Chengdu
Deyang
Government registered poverty rate (%)
4
9
11
21
Income sources (%)
24
Transfer income
Gov. transfer income
Private transfer income
Agr. income
Family business income
Other income


Satisfaction
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Satisfaction with life (%)
83
88
89
90
Satisfaction with services (%)
47
Satisfaction with education service
Satisfaction with health service
Satisfaction with house reconstruction


Trust in government
Mianyang
Guangyuan
Aba
Chengdu
Deyang
Trust in government (%)
49
Central government
Provincial government
County government
Township government

Introduction

Jon Pedersen

In the span of a few minutes, at 14:28 May 12, 2008, an 8.0 magnitude earthquake centered 19 km below ground at YingXiu, Wenchuan devastated lives, houses, and infrastructure over a large area in Sichuan and Gansu.

The number of dead reported amounted to 69,226, in addition to 374,643 injured and 18,923 missing. Around 6,525,000 housing units were destroyed, and 23,143,000 damaged. In addition, a large number of roads were severely damaged and telecommunications, electricity, water, and gas were disrupted. Businesses and public institutions were damaged or destroyed (Yong and Booth 2011). Since the quake happened during school hours, many schoolchildren lost their lives. The extent of the damage compares to the total destruction of all the dwellings of a country the size of Peru, or damage to all dwellings of a country the size of Italy. Map 1 (see next page) gives an overview of the geography of the earthquake.

During the ten years that have passed since the Wenchuan earthquake, communities have been rebuilt in what is one of the most comprehensive reconstruction efforts to have ever taken place after a natural disaster. The purpose of this report is to study the outcome of that reconstruction effort by analyzing four social surveys, carried out in the earthquake-affected area of Sichuan in 2008, 2009, 2011 and 2018 by a team of researchers from the Chinese Academy of Science and Technology for Development (CASTED) and the Norwegian research institute Fafo.

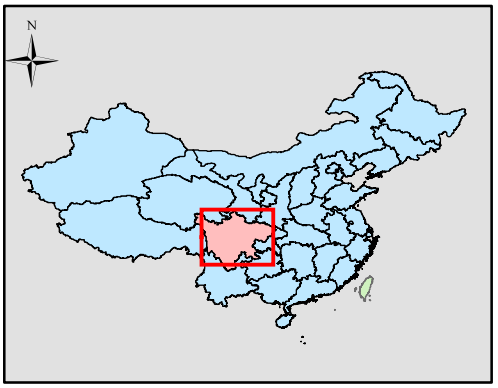
Several recent large natural disasters have seen governments or the international community disorganized, unable, or unwilling to rapidly mobilize resources for emergency aid and reconstruction in an inclusive and comprehensive fashion. Haiti after the 2010 earthquake (Ramachandran and Walz 2015) or New Orleans after the 2005 Hurricane Katrina (Brunsma, Overfelt et al. 2010) come to mind.

However, while it is not difficult to find studies that usefully sum up the natural science behind a given disaster or the functioning of an organization and the specificities of medical relief, there are surprisingly few studies that aim to understand the wider impact of these disasters on society. Moreover, since there are few instances of well-studied apparently successful recovery efforts, the learning that can be distilled from the experiences is limited thus far.

Large-scale disaster reconstruction is a field full of wishful thinking. “Building back better” evokes the idea that communities should be better off after reconstruction than they were before the disaster. This is a natural consequence of the observation that many communities that have been hit by disasters were underprivileged and lacked basic needs even before the disaster. Seizing the chance to make a substantial improvement when resources must be used for reconstruction anyway is an obvious idea.

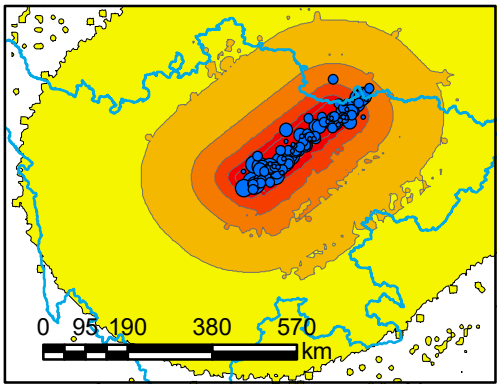
Map 1

Location



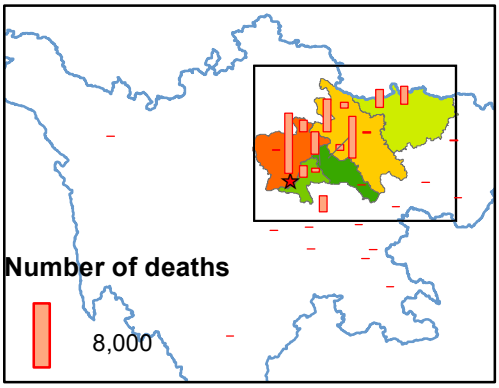
The map shows the location of Sichuan (pink) and and the extent of the map to the right (red square).

The earthquake, aftershocks, and impact zone



The impact zone. Red indicates the most severe shaking of the ground while yellow indicates the least severe. Epicenters of the earthqake and aftershocks are marked with blue circles.

Deaths by May 29, 2008



Number of deaths are proportional to the height of the bars. Most deaths occurred within the study area, but some occurred outside of it.

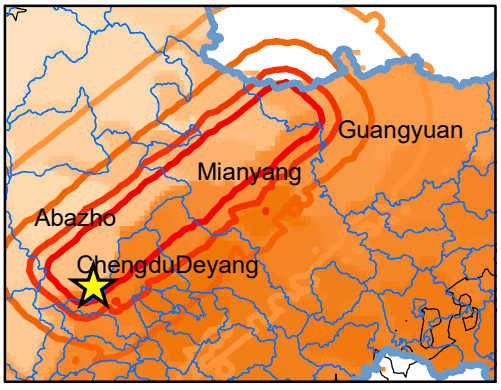
Epicenter and main affected districts

The study area and its administrative districts.Note that some of the districts are larger than the study area, but only the study area is marked.
The epicenter in YingXiu is marked with a yellow star.

Relief

Overall relief of the earthqauke affected area. The area comprises both the Sichuan plain, foothills and high mountains.

Population density



Dark color means higher population density. The categories of earthquake impact (most intense marked with dark red) are indicated.

The idea is also a consequence of seeing a catastrophe as an opportunity because the resource mobilization for the recovery allows thinking in new ways. Nevertheless, the key formulation of Clinton's (2006) disaster recovery proposal, "building back better," was left undefined, with the proposal focusing on processes needed to achieve "building back better" rather than the outcome. Moreover, even among those who complain that the concept has been left essentially undefined (Sandeeka and Suzanne 2014) there is a focus on process.

There are four main scenarios for economic disaster recovery outcomes: The first is creative destruction, where disaster spurs wholesale innovation, the establishment of new institutions, and the invigoration of economic life. The rebuilding after disaster sufficiently stimulates labor markets and businesses to create rapid growth. The second scenario is "build back better," which is similar, but on a more modest scale. It does not necessarily involve qualitatively different approaches to doing things, but economic growth may initially be slow or negative because of destruction of capital assets. Third is the recovery to trend scenario, in which the economy, after an initial slowdown, recovers to it previous path. Fourth, is the no recovery scenario, where the economy does not manage to regain its former strength (Noy and duPont IV 2016). One may in principle add a fifth scenario, namely stagnation or progressive decline, in which a disaster sets in motion a long term negative growth process.

A study of the effects of 6,700 tropical cyclones unfortunately finds little support for the positive scenarios; rather, the no-recovery scenario appears to dominate (Hsiang and Jina 2014). The study demonstrates large negative effects of disasters on the long term economic growth of countries.

The Wenchuan earthquake studies may contribute to this discussion. The four surveys document the living conditions and economic conditions of the earthquake-affected area over a period of ten years. In addition, CASTED and Fafo cooperated on an additional survey Monitoring Economic and Social Development in the Western Regions of China in 2004 (MEDOW). The survey covered the whole of Sichuan, but some of the sample included the area that would later be hit by the Wenchuan earthquake. Together, the five surveys make it possible to trace the development of the area in some detail.

Despite the benefit of having a unique time series, one cannot easily tease out causality from a single case study. The most obvious limitation is the choice of a counterfactual: What would the development in Sichuan have been like in the absence of the Wenchuan earthquake? There is no simple model or example that can serve as a counterfactual. There are several reasons for this. First, area affected by the Wenchuan earthquake is situated in the foothills of the Tibetan plateau between the heavily populated, relatively affluent plain and sparsely populated, much poorer high mountain valleys. It is not like many other places in China. Second, the earthquake happened right at the time of the 2008 financial crisis. Therefore, the earthquake was not the only shock the affected area experienced, and the financial crisis deeply affected other areas in China as well. Moreover, the earthquake response and the crisis response were intertwined. To some extent, the Chinese government actively used the earthquake response to ameliorate the effects of the economic crisis, for example through infrastructure development in Sichuan. Thus, shocks and responses were not totally unique to Sichuan, thus making counterfactuals difficult to identify. Finally, as will be discussed in the following chapter, some of the earthquake response took the form of accelerated implementation of existing poverty alleviation and eradication policies. The government also implemented such policies elsewhere. Methodologically, this creates the same problem in terms of identifying counterfactuals as the previous issue.

Despite these limitations, several questions can be answered. For example, was the aim of rebuilding rapidly met? Was infrastructure improved? Was the government's plan to focus on work and labor followed up? Were people satisfied with the reconstruction efforts? These and other questions will be discussed in the coming chapters.

The questions listed here are purely descriptive. But one should remember that in the context of large-scale disaster reconstruction, as in other areas of social science, description is powerful. Without being able to determine the degree to which regional economic product growth declined or did not decline as a result of the earthquake, or exactly which scenario the reconstruction of Sichuan followed, one may answer binary questions like Was the electricity supply restored within a reasonable time? Was temporary housing faced out within three years, as stipulated in the reconstruction plan? Are the inhabitants of the earthquake-affected area still dependent on government transfers?

These questions can shed light on the overarching issue of whether or not the reconstruction achieved its basic aims. They can also be used to distinguish between the reconstruction effort in Sichuan and, say, Haiti, where dilapidated tent camps could still be found seven years after the 2010 earthquake (Cook 2017).

The report introduces the policies that the Chinese government implemented for dealing with the earthquake before going on to treat some key issues related to the living conditions of the inhabitants following the earthquake. Housing and infrastructure are discussed first, followed by education, health, labor, and income. The topics are then followed up by discussion of the social cohesion and trust in affected communities. The report concludes with a discussion of resilience and disaster preparedness, as well as a summary of the main findings in relation to the different narratives that exist about the Wenchuan earthquake and the reconstruction process.

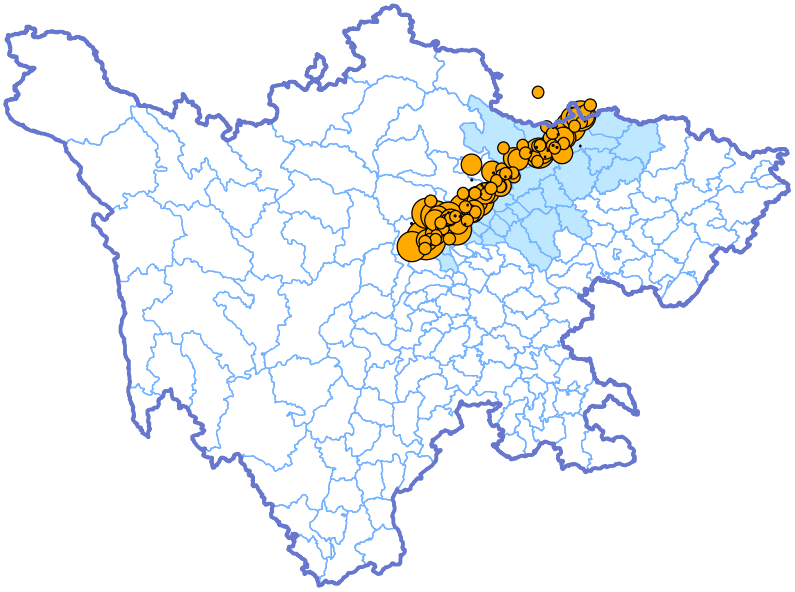
The core of the empirical material on which the report is based is the four surveys. They were all household surveys, with probability sampling comprising about 4,000 households in each survey. The samples were all two stage stratified samples (See Dalen, Flatø et al. 2012 for a discussion of the sampling methods. The 2018 survey uses the same design as the 2011 survey). The first took place in July 2008 and focused on the current situation of those hit by the earthquake as well as comparison to the situation immediately before the quake. The geographic coverage was slightly smaller than the other surveys because some areas were inaccessible (see map 2). The second survey was conducted one year later, and focused on the early recovery process, as did the survey in 2011. Then, in February 2018, the team carried out a new survey focusing on the time that had passed since the earthquake and the current situation of the residents in the earthquake affected area.

Each survey consisted of a household questionnaire, a questionnaire for a randomly selected individual within the household (to answer questions about views and opinions), and a community questionnaire.

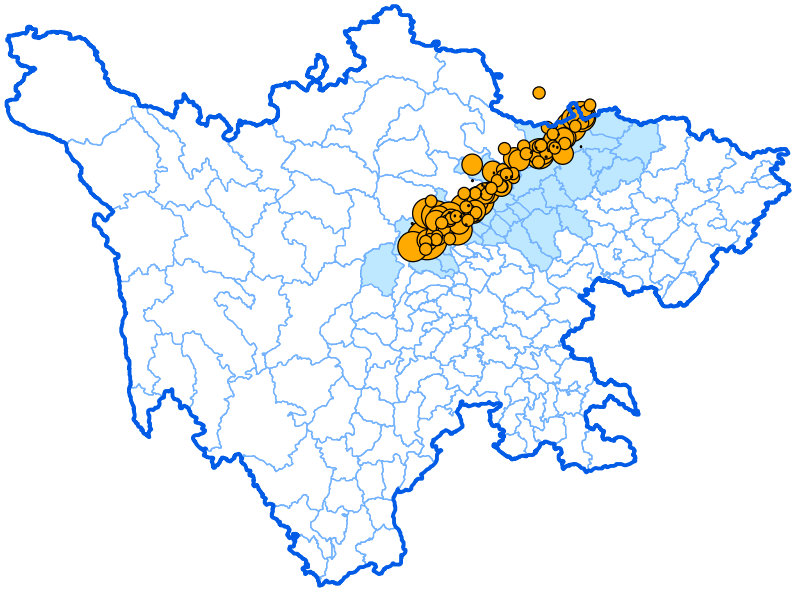
While many studies of disaster-affected populations concentrate on the basic needs of the population with a view to targeting immediate aid, the present studies took as their point of departure that while important, many of these concerns were already satisfied by other means implemented by the Chinese government at central and local levels. The surveys therefore focused on the general adaptation of the population in key areas related to living condition, such as labor, health, education and income, as well as how this adaptation meshed with the aid and reconstruction efforts. Finally, the surveys asked for people's opinions and views about the reconstruction process and institutions.

Map 2

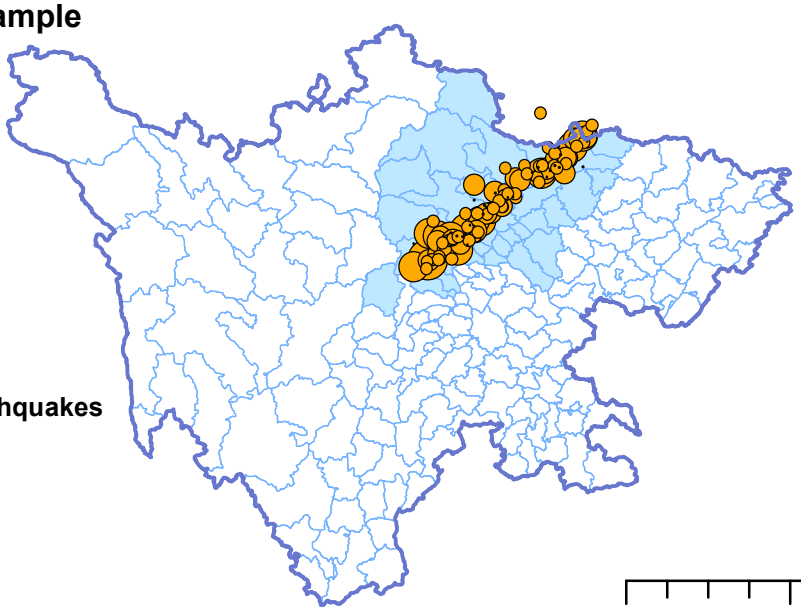
2008 sample



2009 sample



2011 and 2018 sample



1 Disaster policy

Mona Christophersen

Background

Post-disaster recovery and reconstruction for the Wenchuan earthquake included a wide range of responses: search and rescue, medical assistance, sanitation and prevention of epidemics, construction of temporary shelters and schools, resettlement of victims through construction of new houses or financial assistance, recovery of livelihoods, and psychological support.

China is a disaster-prone country exposed to a number of natural hazards, including earthquakes, floods, droughts, and land and mudslides. Faced with such challenges, China developed response and relief systems already in the Sui and Tang Dynasties (AD 581–907) (Zhang et.al. 2018). The policies for these systems developed gradually from keeping granaries in the event of crop failure or natural disasters, and throughout the Ming and Qing Dynasties and the republic period (1368–1949), they included a framework for investigation and reporting, tax exemption, and disaster relief.

Patterns of disaster management after 1949

There have been four main phases in China's disaster management system since 1949 (Zhang et.al. 2018). The first phase, 1949–1978, focused on agriculture. The establishment of the People's Republic of China in 1949 found the country's economy and infrastructure weakened by war. Policies thus focused on agricultural production to stabilize the country. Perceiving disasters as an existential threat to millions of people, as well as to the regime itself, the government made the rapid recovery of agricultural production to secure subsistence the main priority. General awareness of disaster risk and policies to mitigate this risk continued to be weak.

When the policies of "economic development and opening up" embarked on what Chinese describe as "socialist market economy" in 1979, disaster management policies began to serve economic development. The second phase of the People's Republic of China's disaster management policies, 1979–2003, prioritized this economic development. The policies were designed to secure economic progress and not only to protect people's lives and property. Improved disaster response, in combination with a focus on public awareness and disaster mitigation, aimed at general disaster reduction as part of the country's general development policies.

The third phase from 2004 to 2008 started after the outbreak of SARS in 2004 and stressed early warning and improved emergency response to enhance the government's capacity to respond to emergencies and risks. A standardized strategy for emergency response was at the core of the new strategy. It included a legal framework, formulation and revision of contingency plans, and improvement of the emergency response system. Natural disasters were included in the overall emergency management systems, which entailed comprehensive coordination with all relevant commissions and agencies at state, provincial, and local levels. The main transition was a shift from a focus on GDP to a

broader development-oriented approach that included enhanced capacity of emergency management.

The fourth phase identified by Chinese researchers has focused on experiences and challenges from the 2008 Wenchuan Earthquake, particularly the inter-organizational coordination mechanisms connecting the central government, local governments, and non-governmental organizations (NGOs). The inclusion of NGOs in the relief and reconstruction efforts revealed that disaster management goes beyond technical capacity and government response to include risk awareness and general responsibility to reduce risk and possible impact of disasters. This fourth phase is ongoing and suggests a shift from disaster response towards disaster risk reduction and disaster governance, which will be elaborated on further in chapter 8, "Resilience and Risk Reduction."

Government policies for Wenchuan earthquake recovery

With the Wenchuan quake being one of the most destructive earthquakes in China since the founding of the People's Republic of China in 1949,[1] there was a need for special policies to facilitate recovery and reconstruction. In normal disaster response, local governments take the lead, but because of the scale of the Wenchuan earthquake, the central government took a leading role in organizing the recovery and reconstruction, according to one disaster management expert.[2]

In China, the response to natural disasters has three phases: the first is the emergency response, the second is the transitional period, and the third is the reconstruction phase, which were all mirrored in the Wenchuan recovery and reconstruction efforts. Government policies are different for each period. The emergency phase is funded by the emergency relief fund and focuses on food, water, temporary shelter, rescue and medical care, and necessary support for survival.

The second phase, the transitional period, was for the Wenchuan earthquake first estimated to last three months but was later extended to six months. In this phase, assistance shifts from food distribution to living allowances. The last phase is for permanent and sustainable reconstruction. For the Wenchan earthquake Initial plans aimed to complete this phase within three years, while in accordance with the government's bold ambitions; it was completed in two years.

The government in China operates at several levels: the central government, the provincial government, city government, and district or county government. Usually, disaster management is the responsibility of the provincial government. Because of the scale of the Wenchuan earthquake, the central government decided to see the Wenchuan earthquake as a special case and thus took a more central role in the recovery and reconstruction. By December 2008 it had developed a comprehensive plan called the "Overall Plan for Post Wenchuan Earthquake Restoration (NDRC 2008).

First, the central government formulated a fiscal policy to establish the fund for restoration and reconstruction. It provided CNY 25 billion for the initial rescue effort and established a recovery and reconstruction fund of CNY 70 billion for 2008, with some adjustments during the three-year recovery period.[3] The fiscal policy further made adjustments to the finance expenditure structure and supported utilization of foreign emergency loans.

[1] The 1976 Tangshan earthquake had higher casualties, while the Wenchuan earthquake was more destructive in terms of damage and lost property.
[2] Interview with disaster management expert, Beijing April 10, 2018.
[3] http://www.gov.cn/zhengce/content/2008-05/30/content_5718.htm

Second, the government formulated tax and fee policies for the emergency. This policy mainly focused on tax exemption for enterprises and individuals, including both income and import tax for enterprises and personal income, land, and property tax. Further the government waivered construction and administration fees.

The third policy focused on the financial system to resume services and functions. It included recovery of the banks and the ability to implement economic transactions, increase credit guarantees, and make the capital and insurance markets operational.

The fourth policy dealt with land and mineral resources and aimed to readjust plans for land use. This policy included fee and tax exemption for transfer of land-use from agriculture to construction of houses and public facilities. It further incorporated price regulation and compensation for land and increased compensation for mineral resources.

The fifth policy was an industrial policy to support the recovery of industry and improve its ability to produce and assist in necessary adjustments in the aftermath of the earthquake. It aimed to revitalize the tourist economy, promote agricultural production, give support to key enterprises, and encourage local governments to give support to small and medium sized enterprises, including commodities and handcrafts of ethnic minority groups. The policy further aimed to promote innovation, facilitate distribution to markets, and ease several regulations for the industrial sector. It further included a grain policy. Grain availability is traditionally an important factor for keeping social stability. The central government supported the reconstruction of damaged grain depots in Sichuan province, supplied grain for distribution among the affected population, and provided comprehensive agricultural resources to safeguard future grain harvests.

The sixth policy addressed the counterpart assistance by asking 19 provinces to allocate 1 percent of their budget revenues to 24 counterpart counties in the earthquake-affected area. This policy further encouraged enterprises, social groups and individuals to invest in the affected areas.

The seventh policy addressed a variety of assistance. Many schools were destroyed in the earthquake and this policy aimed to bring students quickly back to school, including migrant children and children from poor families. This policy also aimed to supply assistance to disabled persons and other vulnerable groups, including people experiencing particular challenges and difficulties after the disaster. It further addressed employment assistance for persons unemployed after the disaster, aiming at promoting employment and supplying employment opportunities to secure livelihoods. People with financial difficulties after the disaster could be brought into the subsistence allowance system, while offering welfare allowance to injured or retired people, and not least offer legal assistance to those in need of it.

The eighth policy focused on participation and inclusion, encouraging members of society to continue to contribute in cash or in kind and to participate in the reconstruction efforts. The policy aimed at proper resettlement on equal terms for the affected population. Further this policy opened for social groups, such as non-enterprises, private institutions, foundations, trade associations and other institutions to participate the restoration and reconstruction through activities including fundraising, vocational training, and psychological counselling.

At the province level, the government's task was more or less to reproduce these eight policies for disaster relief with some local adjustment. The county-level governments were not supposed to produce local policies. Instead, their task was to implement the policies form the central and province governments.

Recovery policies for households

In the emergency phase, focus was on immediate survival with distribution of in-kind assistance. When the assistance shifted to living allowances in the transitional period, each individual was entitled to CNY 10 and 0.5 kg grain each day. Further, households that had their houses destroyed could get CNY 2000 to build a temporary shelter to live in during the reconstruction period. For partly destroyed houses, the household could get CNY 5000 to repair the house.

Totally damaged houses got the most attention in the reconstruction phase. Depending on the number of household members, the government allocated from CNY 15,000 to 23,000 for reconstruction. Most households, with the exclusion of the poorest, could additionally apply for loans from the Agricultural Credit Bank. Generally, households borrowed CNY 20,000; the loans were exempt from interest the first three years and had a low interest the following years. Usually the loan should be paid back in five years.

In later earthquakes (Yunnan 2013, 2014, Ludian 2014, Jiuzhaigou 2017), the government distributed similar living allowances in the emergency and transitional response phases, but supposedly fewer funds for reconstruction. Fewer casualties and less damage, and consequently less involvement from the central government can explain this change.

Province–county partnerships for recovery

The central government implemented a particular policy to enhance the recovery and reconstruction after the Wenchuan earthquake called the "counterpart citizen assistance policy." The central government asked 19 non-affected provinces, particularly the richer and more developed provinces on the east coast, to form partnerships with the counties most severely affected by the Wenchuan earthquake. [4] Every province had to allocate at least 1 percent of their provincial revenues for three years. These funds facilitated repairing infrastructure, particularly roads and bridges, rebuilding schools, hospitals, local governments, and other public buildings, as well as reconstructing houses for affected families. Each county spent the reconstruction funds in different ways in agreement with their supporting province. One consequence of this policy is differences in local budgets and standards of reconstruction deriving from different economic situations in the counterpart provinces.

The supporting provinces, in cooperation with large enterprises in their province, also contributed to economic recovery. It included recovery of state owned enterprises and forest and agricultural land. They could either invest and develop industries in the earthquake-affected county or facilitate employment opportunities for workers willing to migrate to their province. In addition, these funds granted subsidies to projects for post-earthquake geological disaster management, environmental monitoring facilities, and future initiatives for disaster prevention.

A researcher interviewed in Beijing claimed that although the policy of bridging resourceful provinces with earthquake-affected counties in general was very successful and contributed to a remarkable recovery after the earthquake, the attempts at recovering livelihoods were not similarly successful. [5] This difference disclose the fact that it is easier to build houses than to rebuild lives. Constructing livelihoods is complex processes in a reality of individual choice, opportunity and limitations.

[4] The government's policy document and other sources mention 19 provinces, but in reality it was 20; 18 for Sichuan, 1 for Gansu, and 1 for Shanxi.
[5] Interview with earthquake researcher, Beijing, April 16, 2018.

Non-government actors in the Wenchuan response

Disaster management and response in China has usually been centrally organized and implemented. Yet the scale of the Wenchuan earthquake opened more space for contributions from members of society and different social groups as outlined in the last of the eight policies in the planning document (NDRC 2008).

While the government dominated the response, the Communist Party also took steps to make room for the civil society to participate in the response. Later, a 2009 white paper on disaster prevention recognized the important role of civil society in disaster response (Rooney 2011). In particular, it acknowledged that non-government organizations (NGOs) could supplement the government in emergencies with their ability to raise support and funds from the public, rapidly reach remote areas, and provide psychological assistance to victims.

Whether or not the term NGO can be used accurately in the context of China is up for dispute due to limited autonomy among these types of groups, strict regulations, and the fact that civil society groups are sometimes organized by the government itself (GONGO).[6] We use the term here for registered organizations of civilians with some degree of autonomy from the state.

Local governments welcomed assistance from NGOs and volunteers. The NGOs, on the other hand, were dependent on collaboration with the local governments to get access to disaster areas (Shieh and Deng 2011). One of the main tasks of the NGOs was to form coordinated networks to direct the vast response from volunteers wanting to contribute and people donating funds. Much of this activity took place online through disaster relief web pages. These networks also facilitated NGO operations in the field. The immediate and visible NGO presence in the Wenchuan disaster response was unprecedented in a Chinese context.

Gender polices for the recovery

Experiences show that women and girls tend to be more vulnerable during disasters. For example, in the 2004 tsunami in the Indian Ocean, women were 1.4 times more likely to die than men (Doocey 2007). Because of such statistics, gender mainstreaming is now a key strategy to reduce gender inequality in disaster relief and recovery work (UNDP 2010). The Wenchuan reconstruction plan considered women, children, and the elderly as vulnerable, yet specific gender policies for the Wenchuan recovery and reconstruction are hard to come by. That said, the timing of an earthquake has more significance for how it affects gender and age groups compared to other disasters.

One researcher claimed that the lack of gender-sensitive policies relates to China's family planning policies.[7] The Wenchuan earthquake happened when China's one-child policy still was enforced. As a result, even in rural areas, families had few children, which the researcher claimed equalized the gender gap. Under the one-child policy, families tended to invest more in girls' health and education and it is harder to find significant gender differences. Yet, there are indications that the gender gap in China is currently increasing (Richardson 2017). Our survey confirms this trend by increasing differences in male and female labor force participation.

[6] Examples of GONGOs in China are the All China Women's Federation and the China Disabled Person's Federation.
[7] Interview with researcher, Beijing 16th April 2018.

In the first emergency relief efforts dominated by in-kind assistance, however, it has been pointed out that women's special needs were not met. One example is lack of hygiene articles, such as sanitary pads for menstruating women.[8]

The particular policies for government and non-government cooperation facilitated some efforts directed towards women. One was chatting groups for women, assisting them in processing the traumatic experience of the earthquake. Another was skill trainings to assist women in starting income-generating activities. Many ethnic minority groups live in the area affected by the Wenchuan earthquake and some of the NGOs developed products using traditional embroidery and facilitated bringing the products to the market. Other income-generating projects included raising chicken and livestock.

While labor migration continues to provide an important opportunity for employment among the earthquake-affected population, this migration is gendered. Opportunities for men can be found in construction and roadwork, which demand physical strength considered more relevant for men, although such projects frequently also employ women. Women often search for work considered more suitable for women, often or as babysitters and housekeepers. Yet, most opportunities for both women and men are in the service sector, such as shops or restaurants.

The success of the recovery polices

The government initially planned that the recovery and reconstruction after the earthquake would take three years. Yet they launched the slogan "three-year mission – two years to complete." The government's aim was to have a very quick recovery after the earthquake and it had ambitions to complete the work in only two years. In any context, this was an impressive recovery effort. Despite the program's effectiveness, some criticism emerged. For example, some scholars criticized the high cost of the recovery process.[9]

Evaluation of the success of the different recovery and reconstruction policies points to two main tendencies. One is the more attention a policy gets from the central government, the higher the chance of its implementation's being successful. One example is the central government's emphasis on prioritizing house reconstruction, which resulted in in a very efficient implementation of house reconstruction at the local level. Another finding was that policies that are easy to implement are more successful. For example, it is easier to reconstruct houses than to develop employment opportunities. Therefore, policies for house reconstruction were more successfully implemented than those for recovering work opportunities and livelihoods.

[8] Interview with researcher, Beijing 11 April 2018.
[9] Interview with earthquake researcher, Beijing 16th April 2018.

2 Housing and Infrastructure

Jing Liu

Right after the Wenchuan earthquake in 2008, the Chinese government decided to raise approximately CNY 1 trillion to restore and reconstruct buildings, infrastructure, and so forth in the earthquake-affected areas through more than 200 thousand projects (State Council of China, 2008, p. 56) in about three years (China.net, 2009 March 5). According to the auditing report, most of the projects had been completed by September 2011 (National Audit Office of China, 2012).

Basic supplies such as electricity, water, and sanitation and communication systems were restored in a short time after the earthquake. Many resources reached the affected areas within a week after the quake (Yang, Chen, Liu, & Zheng, 2014, p. 1131) (Dalen, Flatø, Liu, & Zhang, 2012, p. 51). The amount of people living in temporary houses (including tents) fell back to a similar level as in 2004, and conditions in temporary housing have gradually improved. The conditions in permanent houses were found better than they were previously.

The reconstruction plan did not just aim to restore the houses and infrastructure to the same levels as before the earthquake. Long-term development and urbanization had been taken into consideration when the plan was drafted (State Council of China, 2008, p. 12), as well as during its implementation, followed by a continuous plan for urbanization as in the whole of China. For example, 32 percent of the roads to villages in the survey were built between 2008 and 2011 (7 percent in 2008) and 49 percent were built after 2012. By 2018, tap water had become the main drinking water. The percentage of households having installed flush toilets had doubled by 2018 (76 percent) compared to 2004 (34 percent).

Damage and reconstruction of residential houses

Around 4.6 million households (4 million in Sichuan) had their residential dwellings damaged by the earthquake (State Council of China, 2008). Houses in rural areas were more damaged by the earthquake than those in urban areas. Forty-seven percent of the houses in the rural areas either collapsed or were seriously damaged, while in the urban areas, 24 percent collapsed or were seriously damaged, and 37 percent of houses were only slightly damaged. Twenty-one percent of the houses in urban areas were not damaged compared to 6 percent in the rural areas. The most damage was to houses in the very seriously damaged areas of Guangyuan, Deyang, and Aba. Sixty percent of the houses collapsed in the very seriously affected counties in Guangyuan, 40 percent in Deyang, and 31 percent in Aba.

Table 2.1 Evaluation of house damage from households themselves in 2018 (percentages)

2018		Collapse	Serious damage	Medium damage	Minor damage	No damage
Seriously affected area	**Chengdu**	9	17	20	36	18
	Deyang	10	19	20	38	13
	Mianyang	14	24	22	29	10
	Guangyuan	15	33	24	24	4
	Aba	11	27	47	8	8
Very seriously affected area	**Chengdu**	17	34	19	23	8
	Deyang	40	28	13	13	6
	Mianyang	24	26	21	26	3
	Guangyuan	60	28	7	4	1
	Aba	31	20	27	21	2
Rural		20	27	21	26	6
Urban		9	15	19	37	21
All		**18**	**24**	**20**	**28**	**9**

Note: Based on the 2018 survey, all the interviewed households who lived in disaster area during the earthquake Sample size=3,406

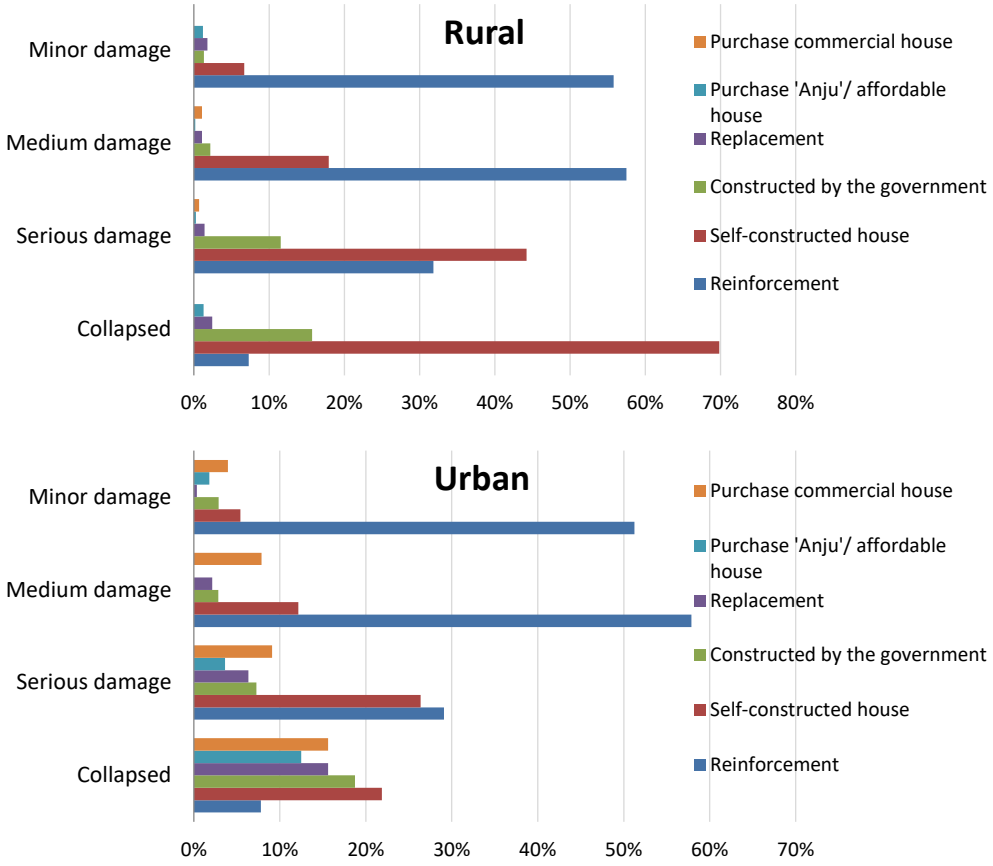
As damage to houses was one of the key measures of the loss from the earthquake, restoring residential houses was also considered to be extremely important in the reconstruction plan. Houses were officially evaluated based on national standards and divided into five categories according to the damage: no damage, minor damage, medium damage, serious damage and collapse. Cash subsidies and methods for supporting re-habitation were generally based on the level of damage, location of residence, household size, and economic situation of the household (Dalen, Flatø, Liu, & Zhang, 2012, p. 37).

Households whose houses had suffered minor damage, medium damage serious damage were offered CNY 1000–2000, 2000–4000, or 4000–5000 in both urban and rural areas. In rural areas, households with collapsed houses were offered CNY 20,000 (CNY 25,000 in urban areas). There were also some other subsidies for households with economic problems. Rural households could choose to reinforce their existing homes, rebuild by themselves or with government help, or buy a new house on the market. If they chose to move away from where their home was originally located, their new housing situation was usually organized by township government or village committees. Households in urban areas had a few more options through local public housing supply system or in the form of cash compensation.

The most important guidelines were included in five main documents: the Overall Reconstruction Plan from the central government, and the "Sichuan Rural Housing Reconstruction Plan" (Civil affairs department in Sichuan province, June 2008), the "Urban Housing Reconstruction Plan" (Sichuan Provincial Government, Oct 2008), the "Technical Guidance on the Seismic Design of the Rural Residential Buildings in Sichuan Earthquake Area" (Construction Department of Sichuan Province, June 2008) and the "Guidance on the Assessment, Reparation, Reinforcement and Demolishment of the Damaged Urban Houses in Sichuan Earthquake Area" (Sichuan Provincial Government, Aug 2008) from the Sichuan government.

Migration for re-habitation occurred on a relatively limited scale due to the governments' acknowledgement of people's preference to stay in their original villages or communities. Only households whose land was seriously damaged by the earthquake or was located in a high disaster-risk area or within a planned urban expansion area were moved to another place nearby (Dalen, Flatø, Liu, & Zhang, 2012, p. 46). According to the 2011 survey, 13 percent of the villages or communities had collective house displacement. Based on the data in 2011 and 2018, more than 90 percent of the households had their houses rebuilt in the same villages or communities, if not on the same location. After the earthquake up to February 2018, 7 percent of the households had their houses damaged or lost again. Around 43 percent of the damages were caused by natural disasters or environmental reasons (30 percent by earthquake, landslide or flood), mainly in the years 2008, 2009, 2012, and 2017; the rest were due to urbanization throughout the period 2008–2018.

Figure 2.1 Damage and methods of restoring houses after the earthquake (percentages)



Note: Based on the 2018 survey, all household members in working age in the interviewed households
Rural sample size=2,168634; Urban sample size=506

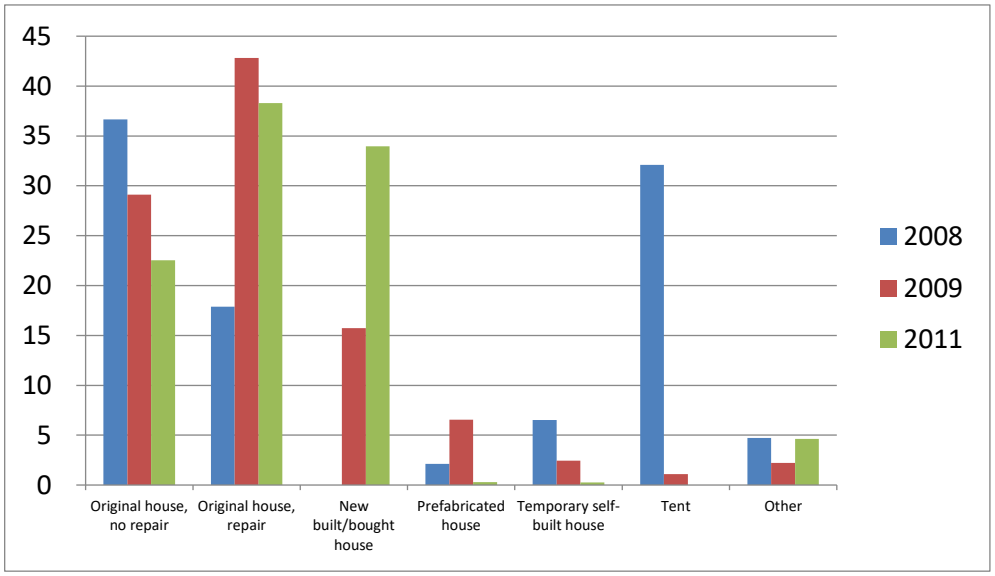
However, in addition to factors such as the large number of dwellings, the difference between urban and rural types of residence, and the various topographic locations of houses, the diverse economic activities and preferences of the residents contributed to the complexity of the plans for restoring houses in the affected areas. Not only did the implementation of reconstruction vary between urban and rural areas and between different counties, but significant differences were also found between villages or communities that

were not far away from each other. Such differences were mainly in the way of rebuilding houses, raising funds and distributing subsidies from different sources. Most of the urban and rural households chose to reinforce the old houses if they were had suffered minor or medium damage. Buying a new household on the market or through the public housing system ("Anju") or replacing the old house with a new one was relatively common among urban households, regardless of the damage to the houses. Rural households, on the other hand, tended to build new houses by themselves, especially if the old ones were seriously damaged or had collapsed.

According to the president of Sichuan province, most of the housing reconstruction had been completed by September 2010 (Jiang, 2010).Two months after the earthquake in 2008, around 41 percent of households had moved into tents, temporary self-built houses or prefabricated houses (Figure 2.2). One year later, the percentage of households without permanent housing had dropped to around 10 percent, with most of these (7 percent) living in prefabricated houses built by the government.

Nevertheless, by the time of the survey in July 2011, 0.6 percent of households were still living in temporary housing and 23 percent of the households had to live in unrepaired damaged houses (8 percent of households with seriously damaged houses and 22 percent of those with houses with medium damage, and 37 percent of those whose houses had minor damage houses) (Dalen, Flatø, Liu, & Zhang, 2012, p. 43). Households that planned to move into newly built houses or to buy houses waited longer than the others. According to the 2018 survey, 59 percent of the households had moved into newly built or bought houses; they reported the moving-in year to be between 2009 and 2010.

Figure 2.2 Type of houses people inhabited after the earthquake[10] (percentages)



Note: Based on the 2008, 2009, 2011 survey, all interviewed households who owned houses
2008 sample size=3,649; 2009 sample size=4,006; 2011 sample size=3,786; 2018 sample size=9,033

[10] Other includes households that lived in other people's houses both before and after the earthquake, and households that used other ways of finding new houses. The graph is figure 2.1 from the report 'Recovering from the Wenchuan Earthquake' (Dalen, Flatø, Liu, & Zhang, 2012, p. 41).

By 2011, the affected households had spent on average around CNY 109,000 on rebuilding or buying a new house, and CNY 19,000 on repairing the damaged houses. The cash subsidies from the governments accounted for around 32 percent of the total cost (40 percent on repairing, 25 percent on rebuilding or buying a new house). Therefore, the households had to raise funding from other sources. A large amount of the funding (43 percent) consisted of savings. They also had to borrow money from banks (9 percent) or from friends or relatives (18 percent). Around 25 percent of the bank loans were paid off between 2012 and 2013, while more than 30 percent of the loans from relatives or friends were paid off after 2013 (Table 2.3). In 2011, over 25 percent of the households had still not paid off their loans.

Table 2.2 Source of funding for repairing, rebuilding or buying a house[11] (percentages)

	Repaired house			Rebuilt/ bought house			All
	Rural	Urban	All	Rural	Urban	All	
Government funding	40	41	40	26	12	25	32
Social support	0	0	0	1	0	1	1
Bank loans	4	3	4	14	17	14	9
Assistance or loans from friends or relatives	14	10	14	22	24	22	18
Own savings	44	48	45	40	49	41	43
Other funding	0	-	0	1	2	1	1

Note: Based on the 2011 survey, all interviewed households that repaired or rebuilt/bought houses
Sample size=2,831

Table 2.3 Loans paid off by year (percentages)

	Repairing		Rebuilding or buying new	
Load paid off	**Bank**	**Relatives or friends**	**Bank**	**Relatives or friends**
2008–2009	7	5	4	1
2010	14	11	7	4
2011	4	13	9	5
2012	15	7	13	7
2013	14	6	11	6
2013–2015	8	15	17	16
2016–2018	12	19	13	22
Outstanding	28	25	25	39
Sample size	*55*	*311*	*683*	*453*

Note: Based on the 2018 survey, all interviewed households who borrowed money for repairing or rebuilding/buying house

[11] Table 2.3 (Dalen, Flatø, Liu, & Zhang, 2012, p. 44).

Damage and reconstruction of infrastructure

The earthquake not only destroyed houses but also cut off the electricity and water supply and damaged roads and public facilities, such as hospitals and schools. Usually, after a large earthquake, shortage of electricity and water, and poor sanitation conditions reduce basic living conditions immediately; damage to roads, hospitals and schools can hinder the development in quality of life in the long term (Johnson & OLSHANSKY, 2016). However, this was not the case in Sichuan.

There was damage to electricity, water supply, sewage, telecommunications. A total of 2.46 million people were affected by power outages due to the damage to power plants and the power grid. A shortage of electricity for pumps and other equipment together with damage to 8,426 water treatment plants and 47,642 km of pipeline generate widespread failure in the water supply; half of the wireless services from China Mobile in Sichuan were lost and the services from China Unicom were cut off in Wenchuan and four nearby counties (Chen & Booth, 2011, pp. 48-52).

Restoring water and electricity supply were prioritized by the government right after the earthquake, and electricity was quickly restored. According to the vice president of Sichuan province, Li Chengyun, electricity had already been reinstalled in 10,028 out of 10,457 villages one week after the earthquake, and telecommunications had been fully restored (china.org, 2008 May 23).Temporary houses had the most problems with electricity supply in 2008 with 38 percent of the households living in temporary housing having no access to electricity (Table 2.4). Electricity supply in the earthquake-affected areas had been restored completely by the summer of 2009.

In 2008, sanitation and drinking water supply had improved since 2004. Tap water supply had increased from 16 percent in 2004 to 22 percent in 2008, 34 percent in 2011 and 59 percent in 2018. By 2008 there had been large improvements. Between 2008 and 2009, the conditions among most of the affected population fell back to the same level as in 2004. The worst conditions existed generally in the camps in 2008 and in the camps with tents and temporary houses in 2009.

Before 2011, drinking water supply was generally obtained from wells (60 percent) due to the fact that most of the affected households lived in rural areas. But the risk of having to drink water from open sources (rivers, streams, etc.) increased among the households living in tents or self-built temporary houses in 2009 (21 percent) compared to 2004 (12 percent).

The sanitation situation, in terms of toilets, waste disposal and food preparation, was similar to the situation in 2004 (Table 2.4). It was different for households living in tents or self-built temporary houses and those living in prefabricated houses. Toilet facilities, waste disposal and water supply were more organized and controlled in the areas with prefabricated houses. Eighty-two percent of the toilets in those areas were flushable (compared to only 10 percent in tents or self-built temporary houses). Eighty-seven percent of drinking water was obtained through the tap (10 percent in tents or self-built temporary houses). And 95 percent of the waste was collected from fixed places (18 percent in tents or self-built temporary houses). The kitchens were more often indoors in the prefabricated houses (66 percent) than in tents or self-built temporary houses (51 percent).

For a period after the earthquake, the affected households had to share rooms with other households. By 2009, the inconvenience had been greatly reduced, with only around 4 percent in temporary houses, down from 19 percent, and 7 percent in permanent houses, down from 13 percent. Thirty one percent of the surveyed households in 2009 still had to share toilets with others.

Other living conditions have also improved since the reconstruction in the earthquake-affected areas. The number of households with access to tap water and a sewage system has increased by over 20 percentage points compared to 2011, and even more for public waste disposal systems.

Table 2.4 Amenities in the household (percentages)[1]

		2004	2008		2009			2011	2018
			Tempo-rary house	Perma-nent	Tent/self-built temporary house	Prefabricated house	Perma-nent		
Access to electricity		99.6	62	98	95	98	99	100	100
Source of drinking water	**Tap water**	16	23	21	10	87	22	34	59
	Well	68	62	71	66	4	66	54	33
	Bottled or barrelled	1	6	3	3	5	2	5	5
	River, stream, spring etc.	15	9	6	21	4	10	7	2
Type of toilet	**Flush toilet**	34	24	30	10	82	35	57	76
	Covered pit latrine	8	10	15	10	2	12	8	6
	Open pit latrine	56	57	53	65	12	50	32	17
	Other	1	3	1	15	3	3	2	1
	No toilet at all		6	2					
Private toilet		89			69	2	92	94	97
Type of kitchen	**Indoor**	91			51	66	90	92	97
	Outdoor	9			48	34	9	8	2
Waste disposal	**Closed container**	2			2	37	5	12	22
	Open container	2			6	33	4	13	19
	Collection place for waste	14			10	25	14	34	45
	Household burns/buries waste	8			17	0	18	14	6
	Other	74			66	5	60	27	7
Shared room with others		3	19	13	5	2	7		12
Sample size		*852*	*2125*	*1526*	*242*	*678*	*3106*	*3808*	*3802*

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all interviewed households

The number of villages or communities with primary schools and middle schools nearby dramatically reduced after the earthquake (Table 2.5). Forty percent of the villages or communities had primary schools nearby before the earthquake while only 15 percent currently do. The percentage of villages or communities having middle schools nearby was reduced from 12 to 8. On the contrary, the number clinics and hospitals increased. Sixty percent of villages or communities had a clinic or hospital nearby before the earthquake, but this figure has since increased to 90 percent.

[1] Estimations for 2004 and 2008–2011 are from table 2.9 (Dalen, Flatø, Liu, & Zhang, 2012, pp. 52,54)

Table 2.5 Village or community with schools and clinics nearby (percentages)

	Before earthquake	2011	2018
Primary	40	19	15
Middle school	12	11	8
Clinic/hospital	60	70	90

Note: Based on the 2008, 2011, 2018 survey, all interviewed villages and communities
2008 sample size=175; 2011 sample size=175; 2018 sample size=197

3 Education

Huafeng Zhang

During the Wenchuan earthquake, many school buildings were damaged, and normal operations of many schools in the disaster areas were hindered immediately after the disaster. However, Fafo's earlier survey found that most students were already back to school few months after the disaster. Right before the earthquake the government had allocated a large amount of funding to promote education among rural poor children (National Student Loan Management Center, Jan 2007). The school fee for nine-year compulsory education was exempted first for rural children and then also for urban children (Ye, 2007). The post-disaster reconstruction offered an opportunity to further improve the educational situation in the area. One decade after the Wenchuan earthquake, Fafo survey has found that the level of education in the earthquake-affected area in Sichuan has improved. The main improvement has been in the rate of dropouts from nine-year compulsory education; also, more children have completed a higher level of education. On the other hand, the proportion of the population having completed senior secondary education has not increased much. Previously, men were better educated than women, but the gender differences in school have disappeared over the past decade in the survey area.

Even though the educational situation has improved in the area, there are challenges with newly built schools located too far away from many households. About half of the interviewed households reported difficulties related to school, among which distance of the schools and school costs were the two main concerns. Therefore, boarding schools were very common among primary and junior high school children in the earthquake area.

Level of education

Over the past 10 years, the level of education has improved in the earthquake-affected area in Sichuan. The main improvement has been in the higher education level. In 2008, 4 percent of the population in the earthquake-affected area in Sichuan had higher education (Table 3.1). By 2018, this figure had increased to 10 percent (Table 3.2). At the same time, the percentage of the population who have completed only primary or junior secondary education has decreased by seven percentage points. Even so, 29 percent of the popula-tion aged 5+ have never been to school or have not completed primary school, while 23 percent have completed only primary school and 26 percent have completed only junior secondary school in 2018 (Table 3.2).

The population with higher education has increased rapidly, while the proportion of the population having completed senior secondary education has not much increased. Even among the young generation (ages16–24), 2 percent had not completed primary school, 7 percent had completed only primary school, and 31 percent had completed only junior secondary school in 2018 (Table 3.2). On the other hand, the graduates of

higher education have more than tripled: about one-third of those aged 16–24 had completed higher edu-cation in 2018, while only 14 percent of the same age group had done so in 2008 (Table 3.1).

Table 3.1 Highest completed level of education among people aged 6 years and older in 2008 (percentages)

		No schooling completed	Kinder-garten	Primary school	Junior secondary	Senior secondary	Vocational school	Higher education	*Total*
All		**30**	**1**	**26**	**30**	**6**	**4**	**4**	***100***
Gender	**Men**	23	1	27	33	7	4	4	*100*
	Women	37	0	25	27	5	4	3	*100*
Area	**Rural**	32	1	28	30	5	3	2	*100*
	Urban	19	1	20	32	11	7	10	*100*
	Camp	15	1	19	32	10	10	13	*100*
Age group	**6–15**	47	6	38	8	0	0	-	*100*
	16–24	3	-	9	48	16	12	11	*100*
	25–39	9	-	27	44	8	7	6	*100*
	40–54	24	-	29	36	7	2	2	*100*
	55+	59	-	26	12	1	1	1	*100*

Note: Based on the 2008 survey, all household members aged 6+ in the interviewed households
Sample size=12,151

The level of education is higher in urban areas than in rural areas in 2018 (Table 3.2). Fewer peo-ple were found in the urban areas who had not completed primary school (17 percent) than in the rural areas (32 percent), and more had completed higher education in the ur-ban areas (20 percent) than those in the rural areas (seven percent). The general level of education was still not high, even in the urban areas. About two-thirds of the population did not continue school after the nine-year mandatory education.

Men were previously more educated than women, but the gender difference in school enrollment has disappeared in the past decade in the survey area. About one-third of women did not complete primary school, compared to one-fourth of men. Gender differ-ences in level of education were mainly found in the two older age groups (40–54 and 55+). As many as 66 percent of women aged 55+ did not complete any school, compared to 42 percent of men in the same age group. For the younger generations, girls had similar access to schooling of various level as boys in the survey areas. Women have even sur-passed men in the higher education level in 2018 (Table 3.3).

Table 3.2 Highest completed level of education among people aged 6 years and older in 2018 (percentages)

		No schooling completed	Kinder-garten	Primary school	Junior secondary	Senior secondary	Vocational school	Higher education	*Total*
All		**29**	**1**	**23**	**26**	**7**	**5**	**10**	***100***
Gender	**Men**	24	1	25	27	8	5	10	*100*
	Women	33	1	21	25	6	4	10	*100*
Area	**Rural**	32	1	24	25	6	4	7	*100*
	Urban	17	1	18	28	10	7	20	*100*
Age group	**6–15**	49	8	33	9	0	-	0	*100*
	16–24	2	-	7	31	16	10	35	*100*
	25–39	6	-	13	34	12	12	23	*100*
	40–54	19	-	32	34	7	3	5	*100*
	55+	54	-	23	17	4	1	1	*100*

Note: Based on the 2018 survey, all household members aged 6+ in the interviewed households
Sample size=13,032

Table 3.3 Highest completed level of education among people aged 6 years and older by gender and age in 2018 (percentages)

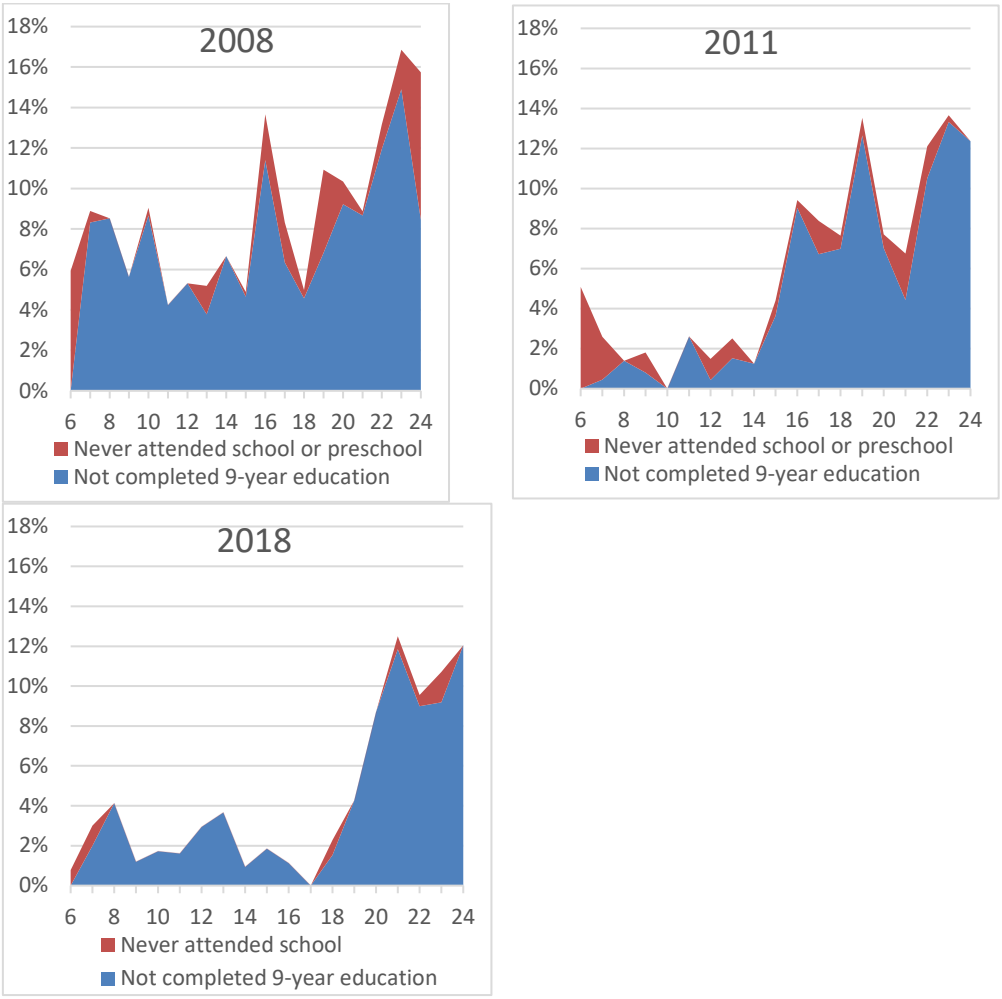
		6–15	16–24	25–39	40–54	55+
Men	**No school completed**	51	2	5	17	42
	Kindergarten	10	-	-	-	-
	Primary school	33	8	13	31	28
	Junior secondary	7	34	34	34	21
	Senior secondary	-	17	12	8	5
	Vocational school	-	10	13	4	2
	Higher education	-	30	22	6	2
	Total	*100*	*100*	*100*	*100*	*100*
Women	**No school completed**	47	2	7	21	66
	Kindergarten	7	-	-	-	-
	Primary school	33	5	13	32	19
	Junior secondary	13	28	35	34	12
	Senior secondary	0	16	12	6	2
	Vocational school	-	11	11	3	1
	Higher education	0	39	23	4	1
	Total	*100*	*100*	*100*	*100*	*100*

Note: Based on the 2018 survey, all household members aged 6+ in the interviewed households
Men sample size=6,541; Women sample size=6,491

School attendance and dropout

School attendance in the Sichuan earthquake–affected area has improved since 2008 (Figure 3.1). In 2008, 2 percent of children/youth aged 6–24 had never been to school. In 2018, only a few cases of children/youth aged 6–24 never having been to school were reported. Most of those who had never attended school were either late enrollments (age 6–8) or older children or youth (ages 17–24).

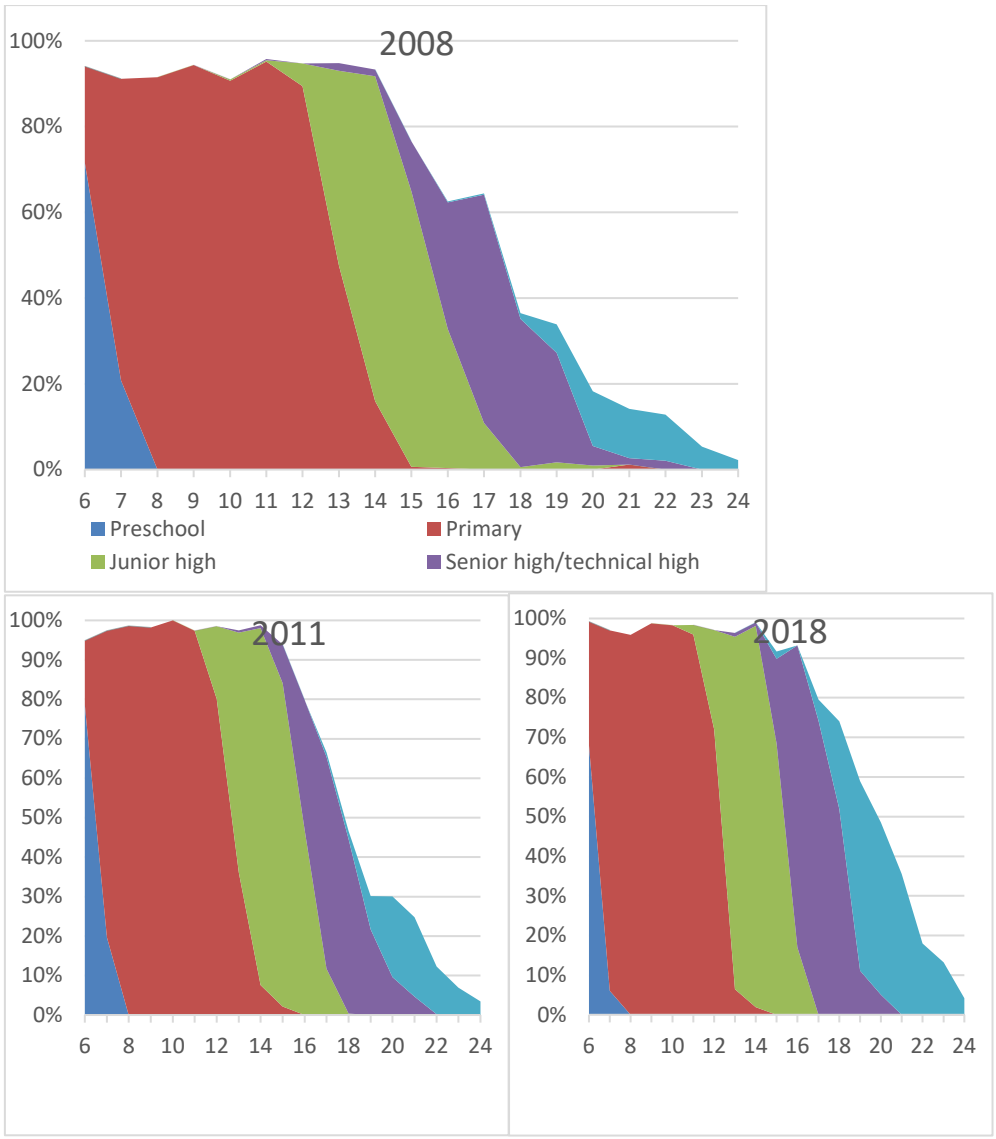
Figure 3.1 Children who never attended school or dropped out of school without completing nine-year compulsory education among children aged 6–24 in 2008, 2011, 2018 (percentages)



Note: Based on the 2008, 2011 and 2018 surveys, all household members aged 6–24 in the interviewed households
2008 sample size=2,759; 2011 sample size=2825; 2018 sample size=2353

School dropout has also decreased over the past 10 years. In 2008, as many as 8percent of children aged 6-24 did not complete their nine-year compulsory education but dropped out of school or never attended school. In 2011, 6 percent of the same age group left school without completing their nine-year compulsory education, while in 2018, this figure decreased to five percent. Furthermore, among the children aged 6-18, 7 percent could not complete nine- year compulsory education in 2008, but only 2 percent in 2018.

Figure 3.2 School attendance among children aged 6–24 in 2008, 2011, 2018 (percentages)



Note: Based on the 2008, 2011 and 2018 surveys, all household members aged 6–24 in the interviewed households
2008 sample size=2,759; 2011 sample size=2825; 2018 sample size=2353

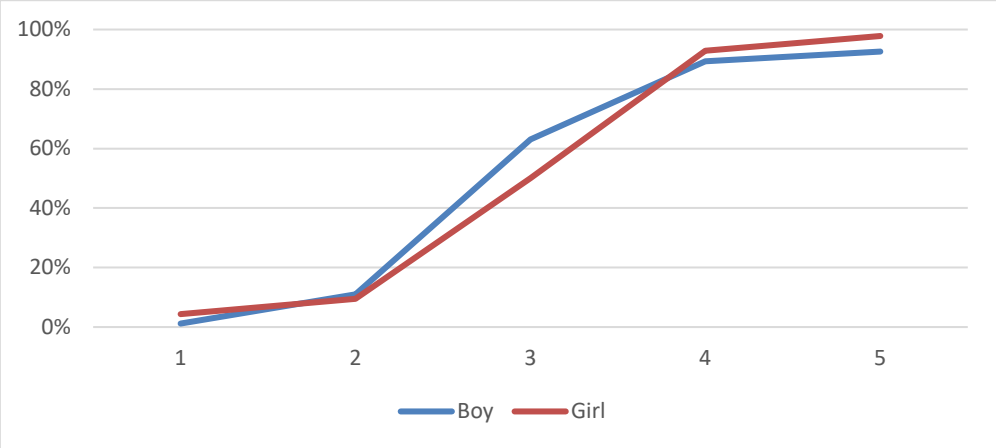
In 2008, school dropout spread out over various age groups. Even among seven-year-olds, the dropout rate was as high as 9 percent. In 2011, the school dropout rate decreased to less than 4 percent for those under 15 years old, while in 2018 only among those aged 20

or older was the school dropout rate still higher than 4 percent. School dropout in earlier stages has apparently declined and has been diminishing over the past 10 years, which contributed most to the lower school dropout rate among the younger generation.

Youth today have a greater tendency to continue in school after completing nine-year compulsory education (Figure 3.2). In 2008, one-fifth of 15- and 16-year-olds chose not to continue after junior high school, while in 2018 only about 6 percent did so. In 2008, about one-third of 19-year-olds and 18 percent of 20-year-olds were still in school, while in 2018, three-fifths of 19-year-olds and almost half of 20-year-olds continued on to college or higher education.

The 2018 survey showed that relatively few children started kindergarten before age of three, but most children of four or five were in kindergarten (Figure 3.3). About half of three-year-old children and nine in ten of four-year-olds in the survey area were in kindergarten. Kindergarten enrollments among boys and girls were quite similar: 93 percent of four-year-old girls and 98 percent of five-year-old girls were in kindergarten, as were 89 percent and 93 percent of boys at the same ages the in 2017/2018 school year.

Figure 3.3 Enrollment in preschool among children aged 1–5 in 2018 (percentages)



Note: Based on the 2018 survey, all household members aged 1–5 in the interviewed households
Boy sample size=358; Girl sample size=227

Boarding school for nine-year compulsory schooling

Table 3.4 School distance and boarding school for primary and junior high students in 2018 (percentages)

		School within half an hour	School over half an hour	Boarding at school	Other	*Total*
All		**53**	**7**	**36**	**4**	***100***
Gender	Male	53	6	35	6	*100*
	Female	53	8	37	2	*100*
Degree of disaster	Seriously affected	53	7	36	4	*100*
	Very seriously affected	54	6	36	5	*100*
Area	Village	49	7	39	5	*100*
	Community	69	5	25	1	*100*
School level	Primary school	67	9	19	5	*100*
	Junior high school	25	3	71	2	*100*

Note: Based on the 2018 survey, children currently enrolled in primary or junior high school in the interviewed households
Sample size=961

Boarding school is common among primary and junior high school children (Table 3.4). As many as 71 percent of junior high school students and 19 percent of primary school students in the earthquake affected areas were in boarding school. Boarding school was more common in rural villages (39 percent) than in urban communities (25 percent). About two-thirds of primary students and one-fourth of junior high school students were enrolled in a school that required less than half an hour travel to reach from home. As many as 9 percent of primary school students had to travel over an hour to reach school, which explained why such high percentages of primary and junior high school children in the survey area were enrolled in boarding schools.

Difficulties related to attending school

The households who had school children enrolled in primary or secondary schools during the survey period were asked about any difficulties the family encountered with their children's attending school. About half of the interviewed households reported difficulties, among which distance of the schools and school costs were the two main concerns (Table 3.5). One in ten households complained that the main problem was that the school was too far from home, and 28 percent of the households were worried about high school costs or living costs (including school boarding fees).

More girls' parents were worried about school and living costs than boys' parents. More households in rural areas (50 percent) reported difficulties sending children to school than households in urban areas (38 percent). The worries about school and living costs increased by the school level of their children: 42 percent of households with children in senior secondary school were concerned about the cost of school.

Table 3.5 Difficulties related to attending school among those enrolled in primary and secondary schools in 2018 (percentages)

		No problem	School too far	High school and living costs	Other	Sample size
Total		**53**	**11**	**28**	**8**	***1,150***
Gender of child	Boy	54	11	27	8	*610*
	Girl	52	11	30	8	*540*
Area	Village	50	11	30	9	*873*
	Community	62	9	23	6	*277*
School level	Primary school	60	10	21	9	*631*
	Junior secondary school	47	12	34	7	*286*
	Senior secondary school	44	9	42	5	*233*

Note: Based on the 2018 survey, children currently enrolled in primary, junior or senior secondary school in the interviewed households
Sample size=1,150

4 Health and Social Security

Huafeng Zhang

The reconstruction after the Wenchuan earthquake provided an opportunity to build an improved healthcare system in accordance with the ongoing health system reforms in the disaster affected area (Wang, 2008). Besides new health services and hospitals built in the earthquake areas, a basic medical insurance system covering the whole population was also established at that period (State Council Document no. 20, 2007; Wegstaff, A. et.).

The utilization rate of healthcare services right after the earthquake was similar to what was found in the 2018 survey, but higher than it was in 2011. The healthcare services were found to be much more used by children and the elderly than others. Women also used healthcare services more than men in all the surveys, but the gender differences in healthcare had been decreasing over the years. Furthermore, increasingly fewer people who did not seek medical care when sick reported being restrained by the cost of medical care. In contrast, more considered it unnecessary to use healthcare services.

Rural residents and the elderly more often visited low quality service providers, such as village doctors. In contrast, the urban population and small children were more likely to visit county hospitals. Relatively few among elderly and those with chronic sickness chose private services.

Health insurance coverage has been increasing since the early 2000s in both urban and rural areas. The three main types of health insurance (New Rural Cooperative Medical Scheme, Basic Medical Insurance for Urban Residents, Basic Medical Insurance for Urban Employees) now cover the majority of the Chinese population.

Although most people in the survey area were covered by some form of health insurance, health insurance still played limited role in terms of number of people whose health costs were actually covered and amount of the medical costs compensated.

Use of healthcare services

The 2009 and 2011 surveys showed that the utilization rate of healthcare service was high right after the earthquake and dropped when reconstruction was completed in 2011. The 2018 survey found that the utilization rate of healthcare service had rebounded to a similar level as in 2009. In 2018, among the total population in earthquake-affected areas, 28 percent had used some form of health services during the month preceding the survey. Both the total utilization rate of healthcare services and the utilization rates by various socioeconomic background variables were quite similar in 2009 and 2018, and higher than in 2011 (Table 4.1).

Perceived health needs were the main determinant of healthcare service utilization. Over 90 percent of those who reported acute sickness or injury and half of those with chronic disease or disability used health services during the 30 days preceding the survey in 2018. There was an increase in the rate of healthcare utilization among those without

acute sickness or injury in the 30 days preceding the survey, indicating a higher healthcare utilization for health checkups among the population.

The healthcare services are also much more used by children and the elderly than others. However, in 2018, children's utilization of healthcare services decreased by 7 percentage points compared to 2009, while healthcare utilization among the elderly increased slightly.

The rural population had slightly higher healthcare utilization, which might be explained by the fact that the population in rural areas is older than that in urban areas. Women used healthcare services more than men in all the surveys, but the gender gap in healthcare utilization has been decreasing over the years, from seven percentage points in 2009 to five percentage points in 2011 and three percentage points in 2018.

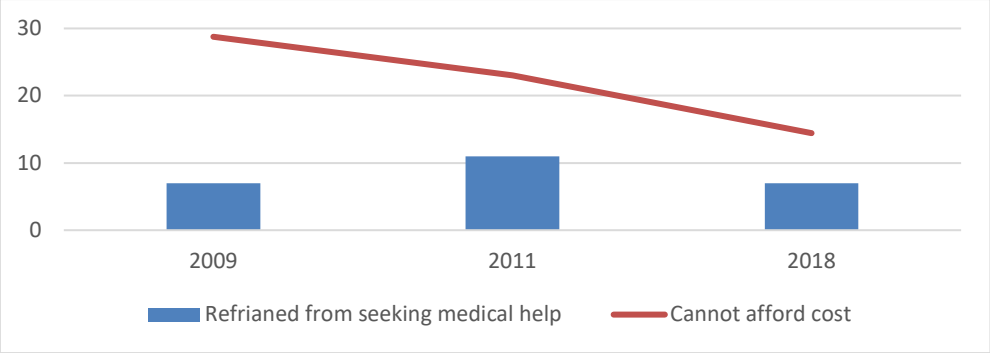
Table 4.1 Household members who had used healthcare services during the previous 30 days, by socioeconomic variables (percentages)

		2009	2011	2018	*Total*
All		**29**	**23**	**28**	***100***
Gender	Male	25	27	27	*100*
	Female	32	30	30	*100*
Area	Village	30	29	29	*100*
	Community	27	25	25	*100*
Age group	Children 0-5	43	36	36	*100*
	Age 6-60	26	22	22	*100*
	Elderly 60+	42	44	44	*100*
Sick or injured past 30 days	Yes	93	93	93	*100*
	No	13	16	16	*100*
Health problem	Had chronic disease or disability	50	50	50	*100*
	No chronic disease or disability	21	15	20	*100*

Note: Based on the 2009, 2011, 2018 survey, all household members in the interviewed households
2009 Sample size=13,518; 2011 Sample size=13,309; 2018 Sample size=13,224

Similar to 2009, 7 percent of those who had been sick or injured in the past 30 days did not use healthcare services in 2018 (Figure 4.1). In 2011, more people reported not using the health services (12 percent). However, when asked about the reason for not seeking medical help, fewer people reported being restrained by the cost of medical care and more considered it unnecessary to use healthcare services. In 2009, 29 percent of those who had been sick or injured did not seek healthcare because of concerns about cost; this figure dropped to 23 percent in 2011 and further to 14 percent in 2018.

Figure 4.1 Refrained from seeking medical help and unable to afford cost in 2009, 2011 and 2018 (percentages)



Note: Based on the 2009, 2011 and 2018 surveys, all household members who had been sick or injured in the past 30 days in the interviewed households
2009 sample size=2733; 2011 sample size=1932; 2018 sample size=2130

Type of healthcare service provider

The quality of healthcare services varies quite a lot in China. Capital city hospitals and county hospitals are generally better equipped and have more qualified doctors and health personnel, and therefore provide better quality healthcare than township/community clinics.

Table 4.2 Type of health service provider visited by those who sought health services in the past 30 days, by socioeconomic variables (percentages)

		Village doctor	Township/ community clinic	County hospital	Capital city hospital	Private clinic/ hospital	Other	*Total*
All		**23**	**34**	**36**	**5**	**10**	**4**	***100***
Gender	Male	23	33	36	5	10	4	*100*
	Female	23	36	37	5	10	3	*100*
Area	Rural	26	35	34	4	9	3	*100*
	Urban	10	31	46	6	14	4	*100*
Age group	Children 0–5	18	33	43	5	9	2	*100*
	Age 6–60	20	30	38	6	12	5	*100*
	Elderly 60+	27	40	33	3	7	2	*100*
Sick or injured past 30 days	Yes	22	38	36	5	10	3	*100*
	No	23	31	37	4	10	4	100
Health problem	Had chronic disease or disability	23	37	39	5	8	2	100
	No chronic disease or disability	22	32	34	4	12	4	100

Note: Based on the 2018 surveys, all household members who sought health services in the past 30 days in the interviewed households
Sample size=3746
Each person could report more than one type of service provider, therefore the sum of the percentages can be more than 100.

On the other hand, many village doctors do not have qualified education but charge much less than others. Close to one in four in the survey areas who chose to seek medical services visited village doctors. Rural residents and the elderly had a greater tendency to use village doctors. In contrast, the urban population and small children were more likely to visit county hospitals. About one in ten visited a private clinic or hospital. Relatively fewer among the elderly and those with chronic sickness chose private services. Finally, there was no apparent gender difference in choice of service provider (Table 4.2).

Medical insurance and social security coverage

Medical insurance coverage has increased rapidly in the past decade. The large-scale survey in Western China that Fafo and CASTED conducted in 2004 showed that as much as 80 percent of the population in the Sichuan earthquake survey area had no health insurance. This figure dropped to 6 percent in 2009 and 2011, and even further to 4 percent in 2018 (Table 4.3).

The health system reforms implemented beginning in the early 2000s introduced the New Rural Cooperative Medical Scheme (NRCMS) in rural areas. During the late 2000s, the Basic Medical Insurance for Urban Residents (BMISUR) was established in urban areas. It covers all urban residents who were not covered by the previously established medical insurance for urban employees (BMISUE). By 2018, NRCMS (82 percent of rural population and 38 percent of urban population), BMISUR (30 percent of urban population and 7 percent of rural population) and BMISUE (17 percent of urban population and 4 percent rural population) had become the main types of medical insurance, covering the majority of the population in China. Commercial health insurance, which provides extra access to health insurance for 14 percent of the urban population and 8 percent of the rural population, was the main supplement to the primary types of medical insurance.

Since the introduction of the New Rural Cooperative Medical Scheme in the early 2000s, rural health insurance coverage has increased rapidly. Our earlier survey indicated that by 2009, health insurance coverage had reached 96 percent in the rural parts of the survey area.

Since the new Basic Medical Insurance for Urban Residents was introduced later than the new rural system, urban health insurance coverage lagged behind rural coverage. Urban coverage was 79 percent in 2009. It increased to 86 percent in 2011 and 94 percent in 2018, close to the rural coverage in 2018.

BMISUR coverage has increased among both urban and rural population in 2018. On the other hand, NRCMS coverage has been decreasing since 2009 among the rural population, although it has been steadily increasing among people living in urban areas. This apparent displacement of rural health insurance to urban areas might be because rural migrants may continue to use rural insurance even though they work in urban areas. At same time, the urban health insurance for urban employees (BMISUE) now has lower coverage for the urban population than before. BMISUE is usually based on formal contracts and therefore not all those who are employed in the urban areas can get it.

The Medical Financial Assistance program was implemented in order to provide special support for the poorest households, of which very few were captured by the survey. Public health insurance only covers state employees, and its coverage has dropped over time. Commercial and other types of medical insurance were quite important, especially for the urban population in 2009, and about one-fourth of urban residents had some kind of commercial or other medical insurance. This figure had dropped sharply by 2011, but by 2018 it had increased again, albeit to a lower level than in 2009.

Table 4.3 Health insurance in 2009, 2011 and 2018 by area (percentages)

	Urban			Rural		
	2009	**2011**	**2018**	**2009**	**2011**	**2018**
New Rural Cooperative Medical Insurance	15	21	38	93	90	82
Basic Medical Insurance for Urban Residents	22	27	30	0	1	7
Basic Medical Insurance for Urban Employees	23	22	17	0	1	4
Medical Financial Assistance	-	1	0	-	0	0
Public health insurance	5	4	2	0	0	1
Commercial or other medical insurance	24	9	14	13	5	8
No medical insurance	21	14	6	4	4	4
Total insurance rate	**79**	**86**	**94**	**96**	**96**	**96**
Sample size	*2468*	*2795*	3,066	*11484*	*11011*	10539

Note: Based on the 2009, 2011, 2018 surveys, all household members in the interviewed households
2009 urban sample size=3746, rural sample size=11484; 2011 urban sample size=2795, rural sample size=11011; 2018 urban sample size=3066, rural sample size=10539
Each person could report more than one type of medical insurance, therefore the sum of the percentages can be more than 100.

Although most people in the survey area were covered by some form of health insurance, health insurance still played limited role in reimbursing medical costs. In 2011, among as many as 87 percent of people who had medical expenses in 2010 reported that they did not receive reimbursement from their health insurance. The 2018 survey showed that while more people got a refund for medical expenses incurred in 2017, there were still 76 percent who did not get paid from their health insurance. Furthermore, among those who had medical expenses of over CNY 1000 in 2017, about half had their medical expenses covered by their insurance. There were also differences in insurance reimbursement between the various insurance types. Those who had insurance for urban employees were better covered than those who had insurance for urban residents or rural insurance (Table 4.4).

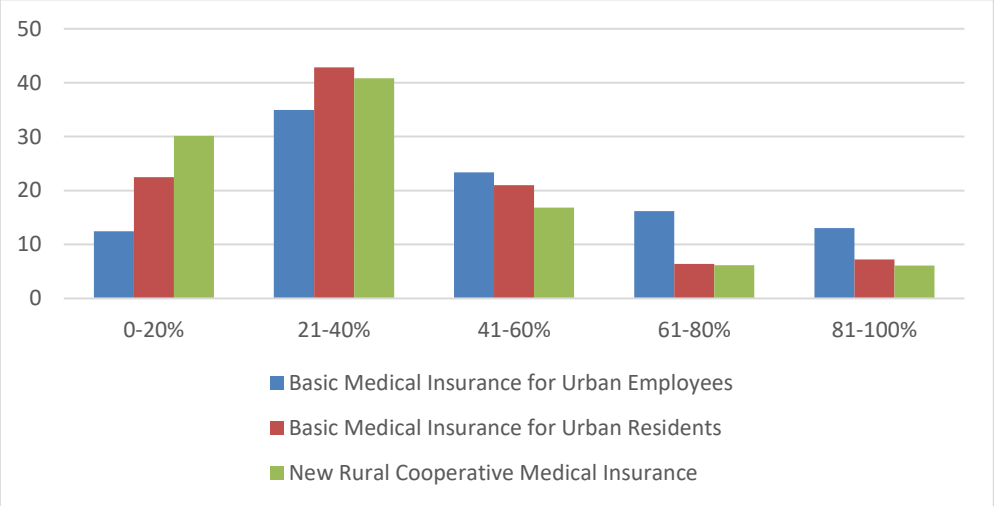
Table 4.4 No insurance reimbursement for medical expenses incurred in 2010/2017, by primary insurance type (percentages of those who had expenses in 2010/2017)

	2011	2018	
	All	**All**	**Medical expenses over CNY 1000**
All	87	76	52
New Rural Cooperative Medical Insurance	87	75	52
Basic Medical Insurance for Urban Residents	85	77	55
Basic Medical Insurance for Urban Employees	78	70	47

Note: Based on the 2011, 2018 surveys, all household members who had primary medical insurances in the interviewed households
2011 sample size=10946; 2018 sample size=11155, sample size for medical expenses over CNY 1000=4347

There are also differences between the various insurance types in terms of percentage of medical expenses refunded (Figure 4.2). Medical insurance for urban employees had better coverage of medical expenses. Among those who had their medical expenses reimbursed, about 13 percent of those with insurance for urban employees got 81–100 percent refunded, and 16 percent got 61–80 percent refunded; for the other two types of health insurance only 6–7 percent got 81–100 percent refunded, and 6percent got 61–80 percent refunded. About 30 percent of those with rural health insurance only got less than 20 percent refunded.

Figure 4.2 Reimbursement received 2018, by primary insurance type (percentages)



Note: Based on the 2018 survey, all household members who got reimbursement from health insurance in the interviewed households
Sample size=1,828

People with different types of health insurance chose different health service providers. As many as 59 percent of those with insurance for urban employees chose county hospitals, and another 10 percent chose capital city hospitals, while among those with medical insurance for urban residents, 48 percent chose county hospitals and 7 percent chose capital city hospitals. People who had rural medical insurance were more likely to visit village doctors (25 percent) and township/community clinics (38 percent). Those with medical insurance for urban residents or rural medical insurance were also more likely to visit private clinics or hospitals (Table 4.5).

Table 4.5 Health service utilization by insurance type, 2018 (percentages)

	Village doctor	Township/ community clinic	County hospital	Capital city hospital	Private clinic/ hospital	Other	*Total*
Basic Medical Insurance for Urban Employees	11	26	59	11	6	5	*100*
Basic Medical Insurance for Urban Residents	16	24	48	7	12	4	*100*
New Rural Cooperative Medical Insurance	25	38	33	4	9	3	*100*

Note: Based on the 2018 survey, all household members who had primary medical insurances in the interviewed households
Sample size=3,341
Each person could report more than one type of service provider, therefore the sum of the percentages can be more than 100.

5 Labor Force and Employment

Jing Liu

Even though the economic losses after disasters are estimated mostly based on the losses of infrastructure and of buildings (State Council of China, 2008), there is understandably a focus on lives and homes in large-scale disasters. However, losses to businesses because of damage to buildings and equipment, as well as disruptions of markets, are just as important (Johnson & Olshansky, After Great Disasters How Six Countries Managed Community Recovery, 2016). When businesses are affected, so is the labor market and people's ability to find or retain jobs.

The labor market in the earthquake area was affected not only by the damage to the local economy caused by the earthquake, but also by other key factors, such as the global financial crisis that started in 2008, change in population structure due to low fertility rate, and labor migration. Efforts from the Chinese government at all levels had been directed at encouraging employment though infrastructure reconstruction projects, vocational training, employment offices, and so on (Dalen, Flatø, Liu, & Zhang, 2012, pp. 60-62).

Both the central and provincial governments had emphasized the importance of having at least one member in an affected household employed. That goal had not been achieved between 2009 and 2011, with a maximum of 93 percent of the surveyed households in 2011 having at least one member being employed. Eighty-seven percent of households reported having at least one member being employed in 2018.

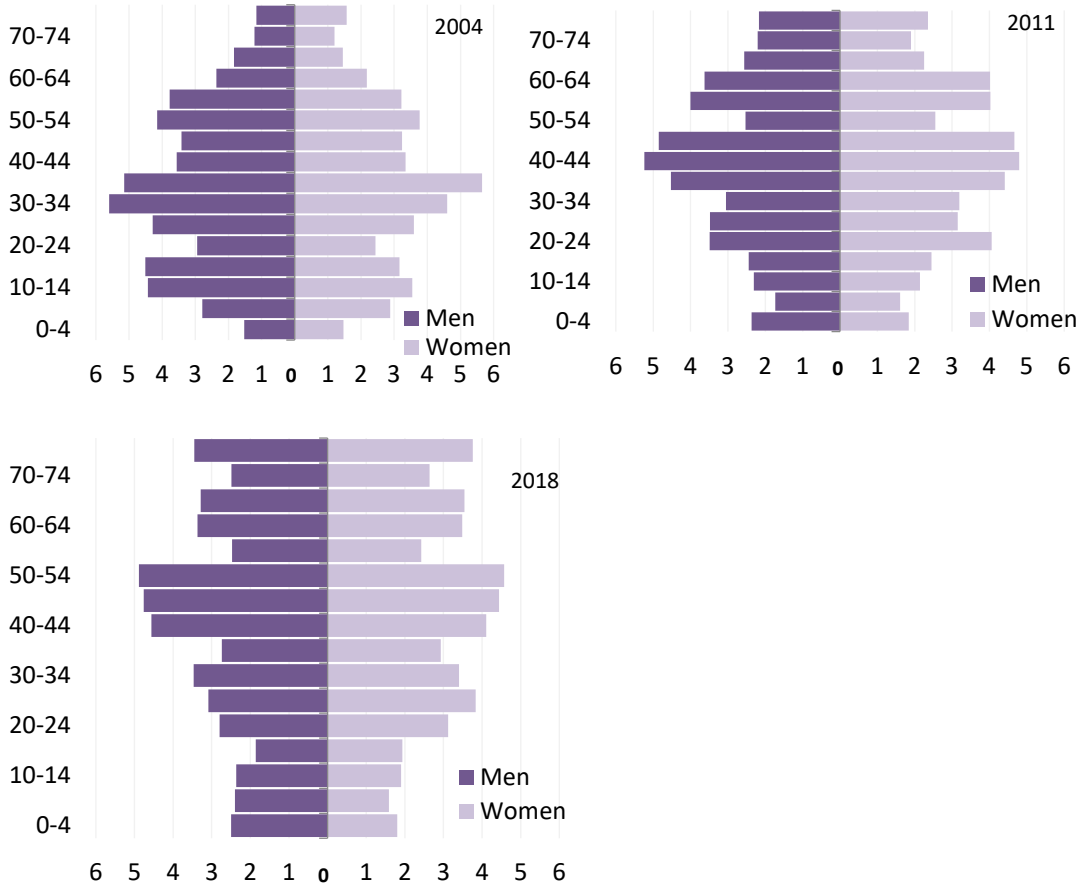
The labor force participation rate dropped between 2004 and 2018. The local labor force participation rate in the earthquake-affected areas stayed stable at around 70 percent between 2008 and 2011 and then dropped to 59 percent in 2018. The unemployment rate in the earthquake-affected areas was as low as 1.5 percent during the whole period. A clear tendency of labor leaving agriculture for business and services, driven by higher income, is also found in the affected areas. Personal income of local labor increased more than 10 percent per year after the earthquake. Labor migrants' incomes were higher than those of locals.

Due to the general labor market liberalization in China introduced as part of the "Reform and Opening Up" (started in the 1980s), the barrier between urban and rural labor markets has been gradually broken down. Observing the changes in labor force structure between 2004 and 2018, we see that the difference in labor market participation, expectations, and choices of job between the urban and rural labor markets have been largely reduced. Nevertheless, income in urban areas is still significantly higher than that in rural areas due to differences in occupations and pension systems.

Population

The age pyramids of the earthquake area exhibit classical examples of "ageing at the base", i.e. a shift in the age structure towards more and more old people because of declining fertility. The low birth rate lead to a significant reduction in population among young age groups, as shown in the age pyramids graphs for 2004, 2011 and 2018 (Figure 5.1). The largest proportion of the population was in the age group 25 to 39 in 2004, shifting to the age group 35 to 49 in 2011 and then 40 to 54 in 2018. Potential labor supply has thus been reduced in the earthquake-affected areas due to the decrease in the young population.

Figure 5.1 Population pyramid



Note: Based on the 2004, 2011, 2018 survey, all household members in the interviewed households
2004 sample size=14,230; 2011 sample size=13,819; 2018 sample size=14,041

Because around 80 percent of the affected population lived in rural areas, migration was common in the earthquake-affected areas, as in other places in West China. Among all the 31 provinces, Sichuan has the second largest number of population emigrating out of the province in China (National Bureau of Statistics of China, Census data: National Bureau of Statistics of China, 2013). Half of the households in 2018 had at least one member either not living with the main household or in the same township or neighborhood committee area, corresponding to around 22 percent of the population. Migration changed the structure of the local population living in the earthquake affected areas. The

local population dependency ratio increased from 45 in 2004 to 62 in 2018. The percentage of households with only members aged 14 years or less or 65 years or more increased from 6 percent in 2004 to 12 percent in 2018.

There was a significant difference between locals and emigrants in terms of the proportion of people between 15 and 44 years old. Around 28 percent of the local population was between 15 and 44 years old in 2018, while 70 percent of the emigrants were in the same age group (Table 5.1). In addition, the gender difference seen in migration between 2008 and 2011 (Dalen, Flatø, Liu, & Zhang, Recovering from the Wenchuan Earthquake, 2012, p. 63) still existed in 2018: more men than women migrated out. The sex ratio of the population as a whole was 102 males to 100 females, compared to 94 males to 100 females in the local population in the earthquake-affected areas.

Table 5.1 Age distribution of local population and population migrated out (percentages)

	2004		2008		2009		2011		2018	
Age	**Emigrants**	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**
0-14	13	19	8	13	9	13	8	13	8	14
15-44	79	36	81	38	81	35	79	34	70	28
45-59	6	26	8	27	8	28	10	26	18	25
60+	1	18	3	22	1	24	3	26	4	33
Sample size	*3434*	*10647*	*2454*	*10248*	*3021*	*11117*	*3284*	*10535*	*3309*	*10667*

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in the interviewed households

Labor Force participation

Unemployment rates have always been low in China (around 4.5 percent) compared to other countries (International Labor Organization, 2017). The earthquake-affected areas are no exception with unemployment rates around 1.5 percent among the local population (those who lived in the main survey household in survey or in the same township or neighborhood committee). The unemployment rate had always been higher in urban areas than in rural areas, but this difference appeared to be disappearing.

The unemployment rate only takes into consideration the amount of population that is active in the labor market, whether employed or unemployed. However, not all people of working age are active in the labor market. Instead, more and more people, especially among those aged 20 to 45 years old, have stopped seeking jobs, and thus choose to remain out of the labor market.

On the other hand, the labor force participation rate, as a measure of the proportion of the working age population (16 years old or more in China) that engages actively in the labor market, either by working or by seeking work, shows more variation in the earthquake-affected areas. The local participation rate (82 percent) in 2004 was higher than the average national level between 2005 and 2016 (70 percent) (International Labor Organization, 2017) while the rate immediately after the earthquake (71 percent) was around 10 percentage points less than the rate in 2004. It was close to the national level between 2008 and 2011 (around 70 percent), but by 2018 it had dropped as low as 59 percent, which was around 12 percentage points less than the national estimation in 2016 and 23 percentage points lower than that in 2004.

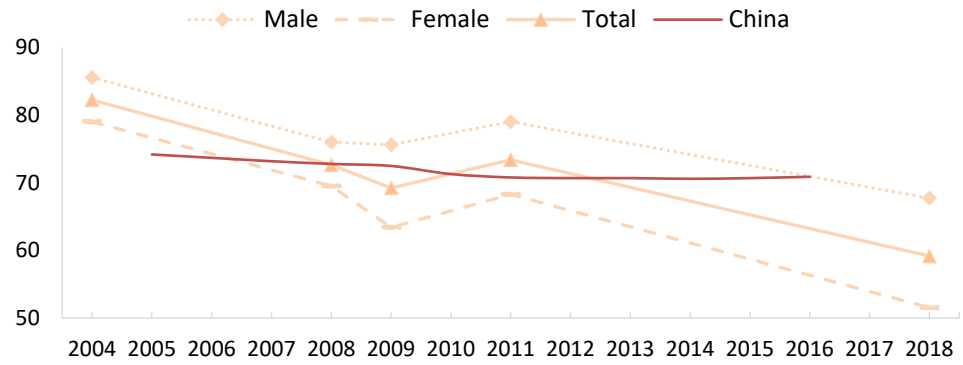
Table 5.2 Labor force status of the local population in working age by gender[13] (percentages)

	2004[14]			2008			2009			2011			2018		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Employed	84	78	81	74	68	71	74	62	68	78	67	72	66	51	58
Unemployed	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1
Out of labor force	14	21	18	24	30	27	24	37	31	21	32	27	32	48	41
Labor force participation rate	86	79	82	76	70	73	76	63	69	79	68	73	68	52	59
Unemployed rate	1.5	1.4	1.5	2.6	2.6	2.6	1.6	2.4	2.0	1.7	1.8	1.7	2.1	1.4	1.8

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in working age in the interviewed households
2004 sample size=8,462; 2008 sample size=8,797; 2009 sample size=9,610; 2011 sample size=9,022; 2018 sample size=9,033

The decrease was much more significant among women than men, though both male and female labor participation showed a decreasing trend between 2004 and 2018 with a slight rebound in 2011. The female participation rate dropped from 79 percent in 2004 to 52 percent in 2018, while the male participation rate dropped from 86 percent to 68 percent. The difference (7 percentage points) between male and female labor participation was not immediately increased by the earthquake. But since 2009, the difference between the male and female labor force participation rates has been increasing, finally reaching around 16 percentage points in 2018.

Figure 5.2 Labor force participation rate in the earthquake affected area (percentages)



Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in working age in the interviewed households
2004 sample size=8,462; 2008 sample size=8,797; 2009 sample size=9,610; 2011 sample size=9,022; 2018 sample size=9,033

[13] Estimations of the percentage of employed, unemployed and out of the labor force between 2004 and 2011 are from Table 3.7 (Dalen, Flatø, Liu, & Zhang, Recovering from the Wenchuan Earthquake, 2012, p. 73).
[14] The estimations for 2004 were based on data for the whole Sichuan province from the survey "Monitoring Social and Economic Development in Western China."

Women more often than men said that they were not working or seeking work because they had to take care of family members or do housework. In 2008 and 2009, around 25 percent of women chose housework and family members over a job, compared to 9 percent of men. The difference has increased substantially to around 20 percentage points since 2011 (Table 5.3) and is more pronounced in rural than urban areas. In the rural areas in 2018, 30 percent of women chose to remain out of the labor market due to housework or family obligations, compared to only 4 percent of men; in urban areas 24 percent of women to 4 percent of men made the same choice.

Table 5.3 Reason for being out of the labor force among local population (percentages)

	2008		2009		2011		2018 Urban		2018 Rural	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Cannot find a job /lost hope	9	7	10	10	4	4	5	2	5	3
Studying or training	0	1	10	5	23	12	9	6	4	3
Housework / taking care of family members	9	27	10	25	1	20	4	24	4	30
Disabled	21	9	15	11	14	14	9	8	21	13
Retired	45	43	50	43	51	43	65	55	58	45
Other	16	13	7	6	7	5	8	6	8	6

Note: Based on the 2008, 2009, 2011, 2018 survey, all household members who are out of the labor force among local population in the interviewed households
2008 sample size=1,834; 2009 sample size=2,877; 2011 sample size=3,634; 2018 urban sample size=937; 2018 rural sample size=2600

Rural labor force participation rates were generally higher than the urban rates (Table 5.4), especially in the older age groups beyond 55 (Figure 5.3). This is because the pension system in China is mainly available to people with urban Hukou registration or those whose employers have been paying them for at least 15 years. Retirement starts from age 55 for most women and age 60 for men. People with only rural Hukou registration or who are self-employed or work in agriculture usually have to largely depend on themselves and therefore to continue working into old age.

The decrease in labor participation in the earthquake-affected areas was mostly driven by the rural labor market. The reduction in labor force participation among rural residents was much more significant than among urban ones after the earthquake. Rural participation rates dropped from 87 percent to 60 percent between 2004 and 2018, while the urban rate was 63 percent in 2004 and has remained around 56 percent since 2008 (Table 5.4).

Table 5.4 Labor force status of the local population in working age by residence (percentages)

	2004			2008			2009			2011			2018		
	Urban	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Employed	58	87	81	54	76	71	53	71	68	54	78	72	55	59	58
Unemployed	5	0	1	4	1	2	2	1	1	2	1	1	1	1	1
Out of labor force	37	13	18	42	23	27	44	28	31	44	21	27	44	40	41
Labor force participation rate	63	87	82	58	77	73	56	72	69	56	79	73	56	60	59
Unemployment rate	7.3	0.4	1.5	6.3	1.8	2.6	4.1	1.6	2.0	3.7	1.3	1.7	0.9	2.0	1.8

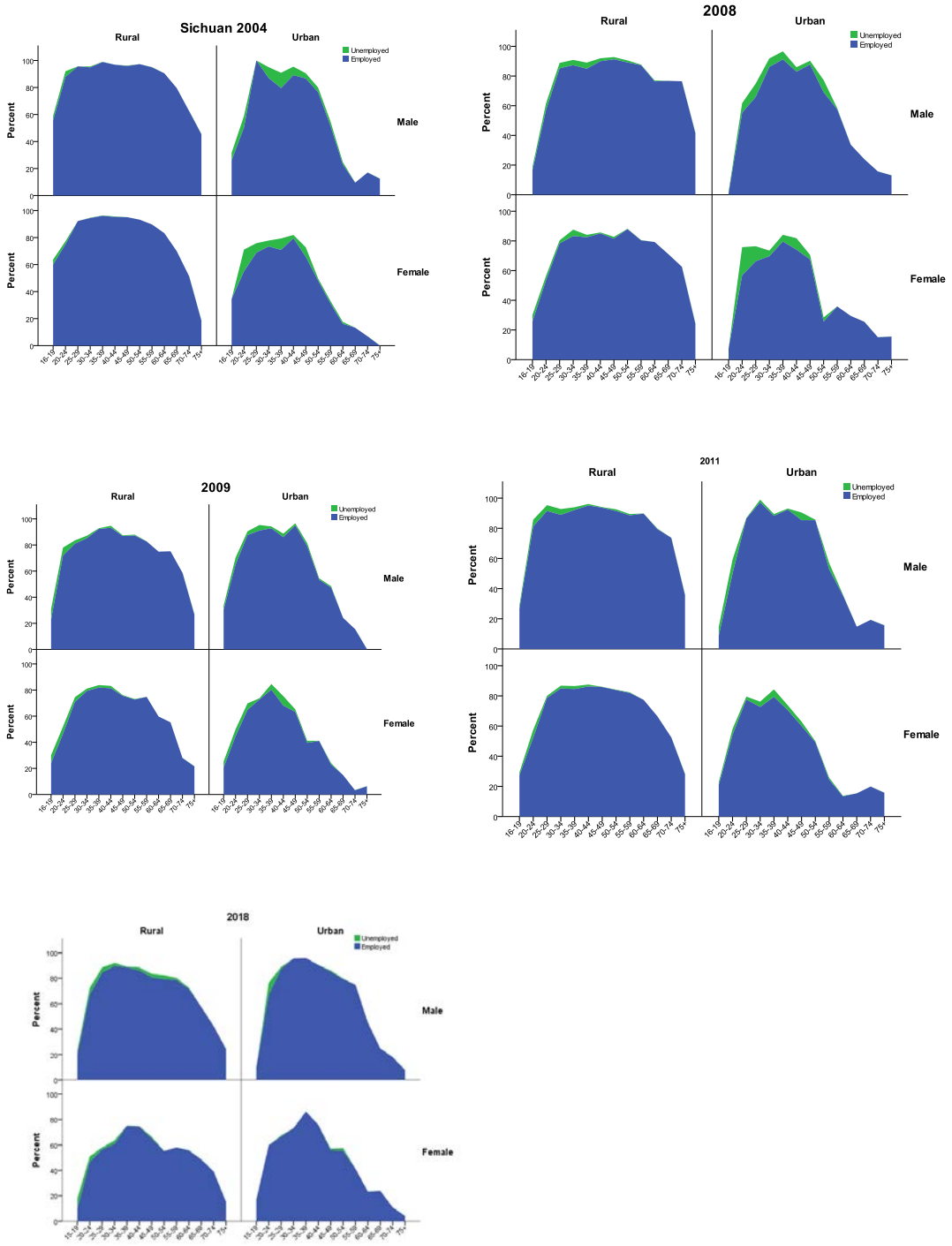
Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in the working age in the interviewed households
2004 sample size=8,462; 2008 sample size=8,797; 2009 sample size=9,610; 2011 sample size=9,022; 2018 sample size=9,033

Labor Force structure

Differences in age patterns of participation in the labor market between urban and rural labor can be easily distinguished (Women functioned more as a reserve workforce in the earthquake-affected areas. They were more sensitive than men to labor market changes after the earthquake (Figure 5.3). However, by 2018 the age patterns of the rural labor market had started resembling those of the urban labor market due to the large decrease in rural labor participation. Male labor participation profiles were much more stable than female participation profiles during the reconstruction period, but a change in the age pattern of male labor was also in evidence in 2018.

Women functioned more as a reserve workforce in the earthquake-affected areas. They were more sensitive than men to labor market changes after the earthquake (Figure5.3). Immediately after the earthquake, more women than men dropped out of the labor market. The change was most significant among urban women aged 50–54 years old. In 2009, both urban and rural women had more important age pattern changes than men. In 2011, with the slight increase in labor participation among people aged 65 and above, the pattern of urban women became similar to that of men. By 2018, the age pattern of the rural female was much more closely resembled that of the urban female, especially among women younger than 55 years old (urban women start to retire after age 55).

Figure 5.3 Labor force participation rate and employment status among local population (percentages)[15]



Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in the working age in the interviewed households
2004 sample size=8,462; 2008 sample size=8,797; 2009 sample size=9,610; 2011 sample size=9,022; 2018 sample size=9,033

[15] The graphs for 2004, 2008, 2009 and 2011 are from Figure 3.6 (Dalen, Flatø, Liu, & Zhang, Recovering from the Wenchuan Earthquake, 2012, p. 77).

Decrease in labor participation was related to the changes in occupational structure in the labor market in the earthquake-affected areas. Agricultural work dominated among local labor in 2004, but the importance of agriculture in providing job opportunities was largely reduced by 2018 (Table 5.5). Seventy-two percent of the local labor force worked in agriculture in 2004. The proportion of the employed taking jobs in agriculture was stable at around 50 percent between 2008 and 2011. But by 2018 this figure had been reduced almost by half (37 percent). On the other hand, the percentage of self-employed increased from 4 percent in 2004 to more than 25 percent since 2008. The increase was mainly associated with the increase in people working in business and services (from 4 to 20 percent).

Table 5.5 Self-employment (percentages of the employed)

	2004		2008		2009		2011		2018	
	Emi-grated	Local	Emi-grated	Local	Emi-grated	Local	Emi-grated	Local	Emi-grated	Local
Self-employed	6	4	20	26	44	28	41	25	30	23
Agriculture	5	72	8	50	4	54	5	54	3	37
Sample size	*1976*	*6841*	*1627*	*5455*	*2044*	*6286*	*2404*	*6447*	*2114*	*5237*

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all employed household members in the interviewed households

The difference between urban and rural individual income[16] among the local population was reduced during the reconstruction (Table 5.6). Individual income was always higher in urban areas than in rural areas (Table 5.6). The urban income had already been more than CNY 800 since 2004, whereas the rural income only surpassed that figure in 2011. In 2004, the ratio of urban to rural individual income was 1.8. This dropped to around 1.2 between 2008 and 2009 before going back up to 1.7 by 2011.

[16] Individual income was defined in the surveys as any kind of income for a specific household member (e.g., wages, bonuses). Income from agricultural activities or family businesses was not counted as individual income because it is considered as income for all household members rather than for a specific person.
Average individual income per month is imputed using the hot deck method. The records are first sorted by location, gender, age and education. Then the income records are imputed under two conditions: first, 0 and less than 100; second, more than 10,000 (more than 80,000 in 2018).

Table 5.6 Individual income among local population (CNY per month, imputed)[17]

	Rural			Urban			Total			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	*Sample size*
Sichuan 2004	552	456	531	1065	841	968	746	696	730	*1392*
Pre-earthquake 2008	833	583	758	983	720	863	876	643	794	*3500*
Post earthquake 2008	761	552	696	933	728	849	805	613	740	*2357*
2009	883	566	785	1023	790	926	911	630	817	*3511*
2011	1067	744	951	1785	1318	1582	1244	923	1122	*3372*
2018	1817	1514	1693	3169	2669	2939	2109	1806	1981	*3506*

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members with individual income in the interviewed households

Different ratios of urban to rural individual income over years were driven by different increasing income curves in the urban and the rural areas (Table 5.6). Rural individual income had been constantly increasing by around 10 percent per year since 2004, except for immediately after the earthquake. However, there was a significant change in individual income in urban areas from before to after the earthquake. Income in urban areas went down by 3 percent per year from 2004 until before the earthquake, but it has been increasing since the earthquake. Urban income increased by 8 percent between 2008 and 2009. The increase in urban areas reached 31 percent between 2009 and 2011, which was the highest increase during the whole reconstruction period. Then the increase (11 percent) leveled off to a similar level as the rural one (10 percent) by 2018.

Women's and men's incomes did not increase equally. Men's income was higher than that of women by 10 percent in 2004, and was in general 40 percent higher than that of women after the earthquake (Table 5.6). In 2004, the gender difference in income was higher in urban areas, but it became higher in rural areas immediately after the earthquake. The gender ratio reached its highest value, 1.6, in rural areas in 2009, perhaps due to the large amount of construction projects going on in that year; it then dropped back to 1.2 by 2018. The gender difference in urban areas in income remained relatively stable around 1.3 after the earthquake.

Labor migration

Besides the change in the population age structure, migration has been one of the most important factors shaping the labor market in China since the opening up in the 1980s. The rapid but unequal economic growth in China created a sudden high labor demand in the more developed areas which could not be met only with local labor supply. Labor migrants were not isolated from the population remaining in the earthquake-affected areas. As members of earthquake area households, these labor migrants still contributed to im-

[17] Estimation on 2004–2011 is from table 3.14 (Dalen, Flatø, Liu, & Zhang, Recovering from the Wenchuan Earthquake, 2012, p. 84). Individual income per month before the Wenchuan earthquake was addressed in each of the three earthquake surveys. The figure reported here is calculated based on the data from 2008.

proving the living conditions of households in the earthquake-affected areas through income sharing. At the same time, labor migration towards developed areas also had consequences for the labor market in the areas from which labor migrated.

Labor migrants had characteristics that were beneficial to competition in the labor market. More than 70 percent of the emigrants were between 15 and 44 years old in 2018 (Table 5.1). The sex ratio of emigrants was 131:100, compared to a sex ratio of around 102:100 in the total population. Migrants also had relatively more education than the locals with 73 percent of migrants having completed at least secondary school (Table 5.7), compared to 45 percent of the local population.

Table 5.7 Education of local population and population migrated out aged 16 and more (percentages)

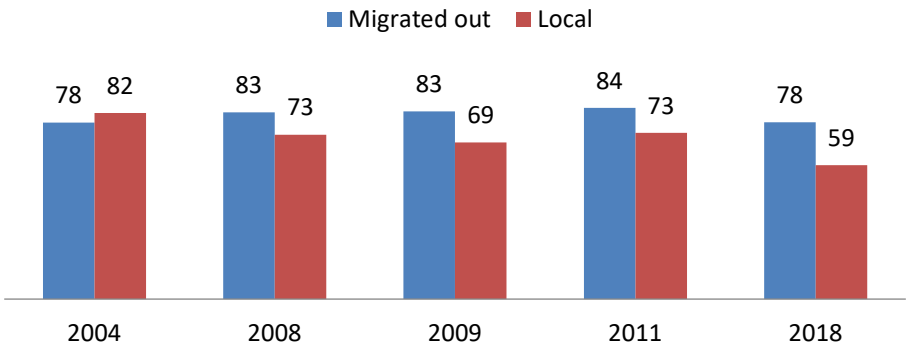
	2004		2008		2009		2011		2018	
	Emigrants	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**	**Emigrants**	**Local**
Illiterate/No schooling completed	19	54	9	33	13	44	11	36	8	32
Primary	23	16	22	26	20	20	18	24	18	23
Secondary	44	21	44	29	45	29	39	27	30	27
High school and above	14	7	25	12	22	8	32	13	43	18
Other	0	1	0	0	0	0	0	0	0	0
Sample size	*2778*	*8542*	*2216*	*8780*	*2346*	*9491*	*2753*	*9111*	*2951*	*8946*

Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all employed household members in the interviewed households

The labor force participation rate was higher among the emigrants than among the local population. The participation rates among the emigrants (83 percent) were around 13 percentage points higher than those of the local labor (70 percent) between 2008 and 2011. In 2018, when the local labor force participation rate went down to 58 percent, 74 percent of the household members living in other places in Sichuan were in the labor market and 84 percent of those living outside Sichuan were in labor market.

Labor emigrants left agriculture-related jobs for industry and service related jobs. Only 4 percent of the emigrants still worked in agriculture in 2018, while 31 percent of them had become professional technicians or industry workers and 23 percent worked as business or service staff. Most of the labor emigrants worked in private enterprises (36 percent in 2018) or were self-employed (30 percent in 2018. With this different occupational structure, the personal income of the emigrants was around 20 percent higher than the amount earned by the locals (Table 5.7).

Figure 5.4 Labor force status locals and emigrants (percentages)



Note: Based on the 2004, 2008, 2009, 2011, 2018 survey, all household members in working age in the interviewed households
2004 sample size=11,340; 2008 sample size=11,019; 2009 sample size=12,273; 2011 sample size=11,964; 2018 sample size=11,978

6 Household Income

Huafeng Zhang

The surveys over the past years have shown a transformation in the income sources on which households in the disaster depend. Households are now more dependent on personal income and less on agricultural income or transfer incomes; this is especially the case for rural households. The government and private assistance were important income sources after the disaster, but they have played a less important role over time. At same time, in recent years, government assistance to rural households has been targeting poor households.

Rural households are to large extent much less dependent on agricultural income now than before. Urban households are more involved in family businesses than rural households. Moreover, the percentage of households with family businesses has been quite stable over the years in both urban and rural areas. Finally, people have more income from "other income sources."

Rural households and male-headed household tended to be involved in several economic activities that generate income. In contrast, more female-headed households, households in the lowest income quintile and those with illiterate household heads were more dependent on transfer income than other households. Finally, the level of education of the household head played an important role in the household economic situation.

At the end of 2015, Chinese President Xi Jinping made an important speech, promising to eradicate poverty in China by 2020. The Chinese government has made great efforts to target poor households and has launched various policies to help the poor. The government defines four types of poor households: Di Bao, Wu Bao households, general poor households and Di Bao poor households. When poor households were asked about the reason for their poverty, they most often cited lack of household members of working age and high medical costs. Poor personal ability, education costs and lack of employment opportunities were also cited as important reasons for poverty.

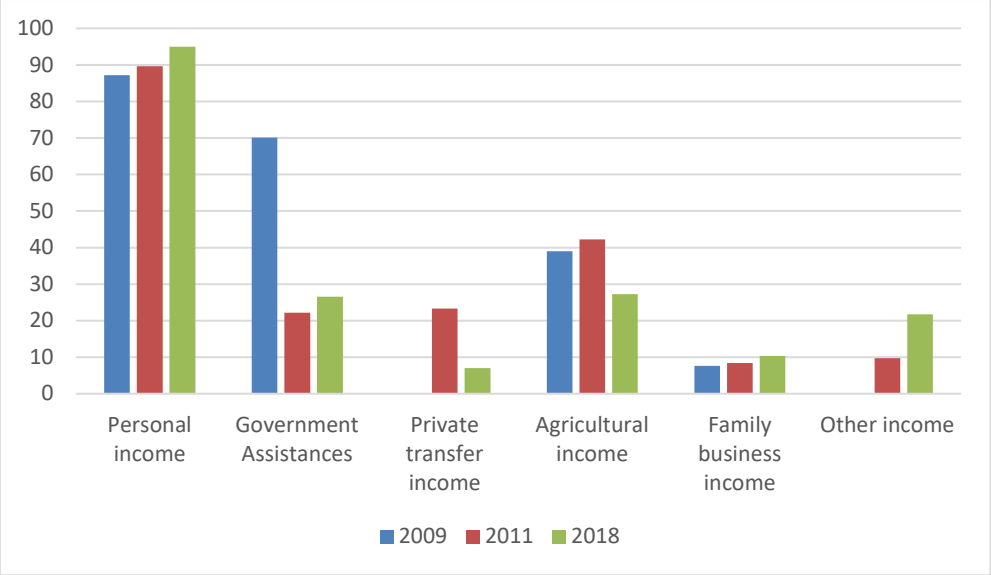
Although the living conditions in the disaster areas had generally been improved over the ten years. Six percent of the households in the disaster areas were still struggling and had not yet recovered from the disaster.

Household income sources

The surveys taken over the past years indicate that the income sources on which the households in the disaster area depend have been transforming. Households are now more dependent on personal income and less on agricultural income or transfer incomes. Personal income here refers not only to wages, bonuses and all kinds of payment from work, but also to pensions, unemployment insurance, lay-off allowance and severance payments paid to all household members. Figure 6.1 shows that in 2009, about 87 percent

of households had personal income; this figure increased to 95 percent in 2018. Furthermore, as Table 6.1 shows, the main reason for the overall increase in access to personal income was the higher access to personal income among rural households.

Figure 6.1 Households with access to various income sources in 2009, 2011, 2018 (percentages)[18]



Note: Based on the 2018 survey, all interviewed households
2009 sample size=3,984; 2011 sample size=3,725; 2018 sample size=3,660

All the surveys asked the households whether they had received any government assistance during the one-year period preceding the survey. During the first year after the disaster, about 70 percent of the households in the area received some form of government assistance.[19] This figure dropped to 22 percent after the reconstruction was completed in 2011 and has increased slightly since then.[20] However, government assistance to urban households has been dropping over the past years, although it has increased in rural areas (Table 6.1 . This might indicate a better targeting of poor households or reflect the gov-ernment's efforts to combat poverty in rural areas in recent years. On the other hand, private transfer income decreased sharply between 2011 and 2018 in the survey areas. In 2009, part of the sample was households living in camps after the disaster. Most of the camp households (94 percent) received government assistance.

Rural households are to large extent much less dependent on agricultural income now than before. Households were asked to report the net cash income from their agricultural activities, which did not include products for self-consumption and from all the costs for the activities were deducted. After the earthquake, about 50 percent of the households reported cash income from their agricultural activities,[21] but in 2018 only 33 percent did

[18] The questions about private transfer income and other income were not included in the 2009 survey.
[19] The housing rebuilding assistance after the earthquake was not included here.
[20] Government assistance includes any minimum living assistance or assistance of Wu Bao/ Di Bao and other kinds of government allowances and subsidies.
[21] Agricultural income here refers to any net cash income from crop production, animal husbandry, fishing, or livestock breeding, excluding the cost of fertilizer, pesticide, seed, fodder and other costs of agricultural activities.

so. In both 2009 and 2011, slightly more than 70 percent of the households in the survey areas reported conducting some form of agricultural activity; in 2018, about half were still conducting agricultural activities. That means that about one-third of those who conducted agricultural activities did not have any net income from those activities. They might produce only for self-consumption and it is important for them to have additional income from other activities.

Table 6.1 Access to various income sources in 2009, 2011, 2018 by area (percentages)

		Personal income	Government Assistance	Private transfer income	Agricultural income	Family business income	Other income
Urban	**2009**	96	66		5	19	
	2011	95	20	18	8	16	17
	2018	97	12	6	8	18	18
Rural	**2009**	86	70		47	6	
	2011	88	23	25	53	6	7
	2018	95	31	7	33	8	23
Camp	**2009**	90	94		5	6	

Note: Based on the 2009, 2011, 2018 survey, all interviewed households
2009 urban sample size=600, rural sample size 2,876, camp sample size 508; 2011 urban sample size=887, rural sample size 2,838; 2018 urban sample size=875, rural sample size 2,785

Urban households are more involved in family business than rural households. Moreover, the percentage of households with family businesses has been quite stable over the years in both urban and rural areas. Finally, people have more income from "other income sources." Other income source here refers to any income from house and land rental and income from rent, interest, stock dividends and investment dividends. Rural households are now more involved in renting housing or land and investment activities than before. A higher percentage of rural households than urban ones now have access to such incomes. During the recent period of urbanization, some rural households got extra houses to compensate for the land they lost, and they in turn received income from renting out these houses. In other cases, some members of rural households migrated to cities for work and therefore rented out their land.

Table 6.1 shows the number of different types of household economic activities that generated income, that is, work-related personal income, agricultural income, family business income and other income. Transfer income is not counted as an income source from household economic activities. In the survey areas, about half of the households were dependent on one type of income source, 41 percent had access to two types of in-come source, and 7 percent had three or more types of income source. The survey affirms that rural households tend to be involved in several economic activities that generate in-come: 44 percent of the rural households had two different types of income source, and 8 percent had three or more different types of income source. On the other hand, 62 percent of the urban households were dependent on only one type of economic activity. Male-headed households had more varieties of economic activity than female-headed house-holds. Households in the lowest income quintile were more dependent on only one type of income source. However, households with higher educated household heads also tended to focus on only one income source, namely personal income, as will be discussed later.

Table 6.2 also presents the households that are dependent on transfer income only. About 1 percent of interviewed households did not have access to any other type of income-generating economic activities and transfer income was their only income source. More female-headed households (3 percent) were only dependent on transfer income than male-headed households (1 percent). Households in the lowest income quintile (5 percent) and those with illiterate household heads (3 percent) were more likely to depend only on transfer income.

Table 6.2 Number of income sources, by socioeconomic variables (percentages)

		1	2	3 or more	Only transfer income	*Sample size*
Total		**51**	**41**	**7**	**1**	***3,660***
Area	**Rural**	47	44	8	1	*2,785*
	Urban	62	31	5	1	*875*
Gender of household head	**Men**	49	43	8	1	*3,046*
	Women	59	33	5	3	*614*
Household income per capita in quintile	**Lowest**	57	34	4	5	*852*
	Low	46	47	7	0	*629*
	Middle	50	43	7	0	*696*
	High	48	42	10	-	*682*
	Highest	50	41	8	0	*801*
Highest completed education for household head	**Not complete any school**	51	41	5	3	*1,121*
	Primary	45	46	9	1	*1,004*
	Junior secondary	49	43	7	0	*998*
	Senior secondary	58	31	10	1	*315*
	Higher education	69	29	2	0	*185*

Note: Based on the 2018 survey, all interviewed households
Sample size=3,660

Households with a highly educated household head tended to rely only on personal income and had very little access to other types of income sources, as indicated by Table 13. In contrast, households with lower educated household head tended to rely on transfer income, agricultural income and other income.

The 2018 survey showed that fewer female-headed households conducted agricultural activity, and they were more likely to receive private transfer income than male-headed households (Table 6.3). However, female-headed households were not necessarily poorer than the male-headed households, as will be discussed later.

The poorest households, as shown in lowest income quintile in Table 6.3, had much less access to personal income compared to other groups. At same time, they relied more on agricultural income and public or private transfer income than did other households.

Table 6.3 Access to various income sources by gender and level of education of household head in 2018 (percentages)

		Personal income	Government assistance	Private transfer income	Agricultural income	Family business income	Other income
Total		**95**	**27**	**7**	**27**	**10**	**22**
Gender of household head	**Men**	96	27	6	30	10	22
	Women	93	25	11	16	11	20
Highest completed education of household head	**Never been to school**	92	33	10	30	6	20
	Primary	95	26	6	32	11	25
	Junior secondary	96	26	6	26	14	22
	Senior secondary	98	18	5	17	14	21
	Higher education	99	7	4	7	9	17
Household income per capita in quintile	**Lowest**	82	33	10	33	5	17
	Low	98	30	8	35	8	19
	Middle	99	28	6	28	8	22
	High	99	25	7	23	13	26
	Highest	99	18	5	19	17	24

Note: Based on the 2018 survey, all interviewed households
Sample size=3,660

Household income differentiation

Sorted by household income per capita, all the interviewed households can be divided into 5 quintile groups. Table 6.4 shows the quintile groups of household income per capita in the survey areas. More urban households are in the highest income quintile (42 percent) while more rural households are in the lowest income quintile (27 percent).

Female-headed households had similar economic situation to male-headed households, except that slightly more female-headed households were in the highest income quintile (25 percent) than the male-headed households (21 percent). That there were more female-headed households in the highest income quintile might be because more female-headed households were urban households. The 2018 survey showed that more than one-fourth of urban households were female-headed; while in rural area, 15 percent of households were female-headed. Although many households were female-headed simply because there were no adult men in the household, some were female-headed because women had high status in the family. The latter is quite often the case in highly educated families.

The survey found that one in four female-headed households did not have a male household member aged 18 or above. Furthermore, among the female-headed households in the urban areas, about 43 percent had a household head with higher education.

The level of education of the household head plays an important role in the household's economic situation. As many as 63 percent of the households with a highly educated household head were in the highest income quintile, compared to only 12 percent of the households with an illiterate household head. On the other hand, more than one-

third of the households with an illiterate household head were in the lowest income quintile, compared to only 5 percent of the households with a highly educated household head. Households with an old household head were more likely to be among the poorest. Many of them were the elderly left behind in rural areas when their children had migrated to the urban cities for work.

Table 6.4 Household income per capita quintile, by socioeconomic variables in 2018[22] (percentages)

		Lowest	Low	Middle	High	Highest
Area	**Rural**	27	20	19	19	15
	Urban	11	10	17	21	42
Gender of household head	**Men**	23	18	19	19	21
	Women	23	14	16	21	25
Highest completed education for household head	**Not complete any school**	34	19	18	17	12
	Primary	21	18	23	20	18
	Junior secondary	19	18	17	21	25
	Senior secondary	13	14	17	21	35
	Higher education	5	7	10	14	63
Age of household head	**20–39**	15	17	20	19	30
	40–49	16	18	22	20	25
	50–59	20	18	20	19	23
	60–69	27	20	17	19	18
	70+	39	13	13	18	17

Note: Based on the 2018 survey, all interviewed households
Sample size=3,660

Poverty and vulnerable households

Poverty alleviation is at the top of the Chinese government's agenda. At the end of 2015, Chinese President Xi Jinping made an important speech, promising to eradicate poverty in China by 2020. The Chinese government has made great efforts to target poor households and has launched various policies to help the poor.

The government defines four types of poor households: Di Bao households, Wu Bao households, general poor households, and Di Bao poor households. Both Di Bao and Wu Bao households are evaluated and designated by the Ministry of Civil affairs every year. Di Bao households are defined as households with a monthly income lower than the local minimum living standard. Wu Bao households are rural households with only household members who are elderly, disabled or children and are not able to work. Government-registered Di Bao and Wu Bao households receive a government allowance from the Ministry of Civil affairs.

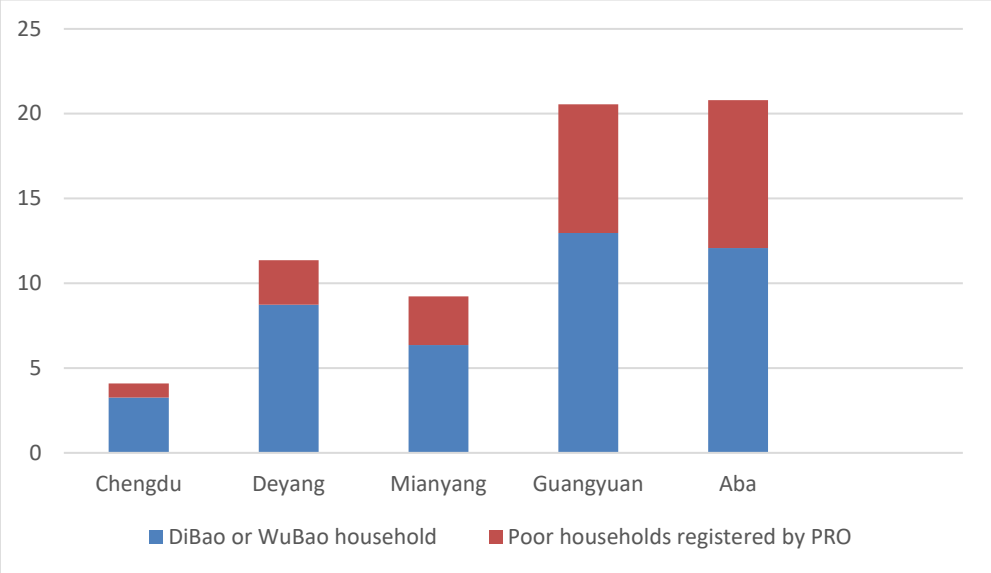
General poor households are evaluated and registered by the poverty reduction office (PRO).[23] General poor households are those whose annual yearly net income is lower than the national standard. Di Bao poor households are evaluated and registered by both the

[22] Income per capita quintile is calculated based on population level, not household level.
[23] See http://www.cpad.gov.cn/col/col282/index.html

poverty reduction office and the Ministry of Civil Affairs. Di Bao poor households' income levels are not only lower than the national standard but also lower than the local minimum living standard. The main differences between Di Bao/Wu Bao households and general/Di Bao poor households registered by the PRO are that Di Bao/Wu Bao households are considered to have lost the ability to generate income; therefore, the government provides a living allowance to guarantee their basic needs. In contrast, general/Di Bao poor households are those with very low income but who still have the ability to generate income. The aim of government's poverty alleviation program is to help them out of poverty. All four types of government-defined poor households are evaluated every year, and the figure reported in this report was based on 2017 registration data.

Our 2018 survey found that in the disaster area, about 3 percent of households were classified by the government as poor households (including general poor households and Di Bao poor households), and 7 percent were registered as Di Bao or Wu Bao households (Figure 6.2). The distribution of the general poor/Di Bao poor households varies by region. One-fifth of the households in the Guangyuan and Aba disaster areas were still registered as general poor/Di Bao poor households or Di Bao/Wu Bao households, while this figure was only 4 percent in Chengdu.

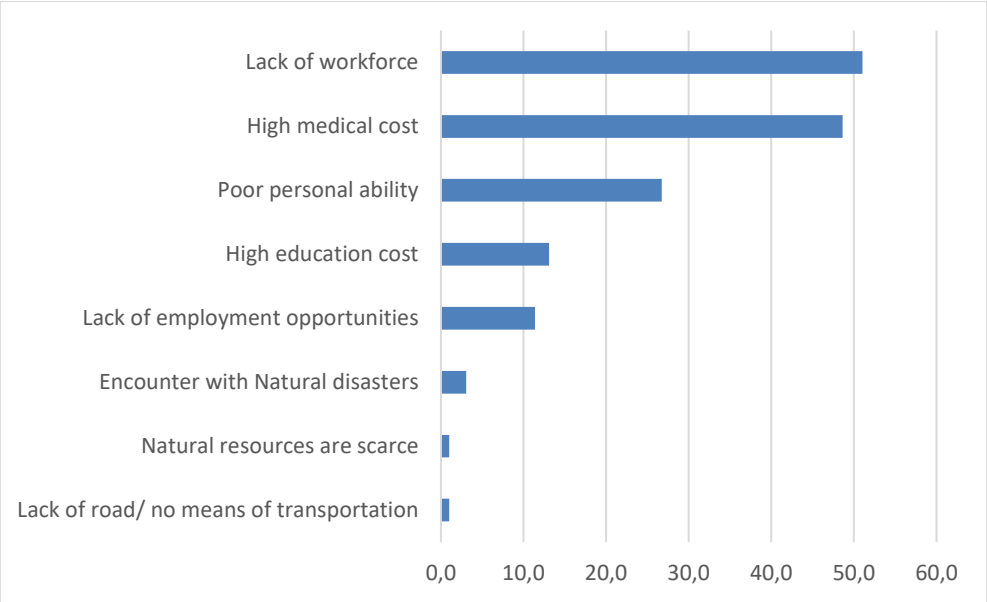
Figure 6.2 Government classified poor households in 2017 by district (percentages)



Note: Based on the 2018 survey, all interviewed households
Sample size=3,715

When asked about the reason for their poverty, Figure 6.3 shows that most respondents cited lack of people of working age in the household and high medical costs. Twenty-seven percent of the poor households reported poor personal ability, which was quite often related to a low level of education. Education cost and lack of employment opportunities were cited by over 10 percent of the poor households. Natural disaster, scarcity of natural resources and lack of roads were not considered main reasons for poverty, having been cited by 3 percent, 1 percent and 1 percent of poor households, respectively.

Figure 6.3 Reasons for poverty in 2018 (percentages)



Note: Based on the 2018 survey, all current and past government-registered poor households
Sample size=514
Each poor household could report more than one reason of the poverty, and the total therefore sums up to more than 100 percent.

Rural households and urban households are faced with different challenges. More than half of the rural poor households reported problem of "lack of workforce" and "high medical costs"; one in four urban poor households were concerned about medical costs and 44 percent lacked labor force. On the other hand, the urban poor were more concerned about educational costs (23 percent) and lack of employment opportunities (31 percent) than the rural poor (12 percent and 8 percent, respectively). Finally, more female-headed poor households had the problem of having few household members capable of working than male-headed households (Table 6.5).

Table 6.5 Reasons for poverty by area and gender in 2018 (percentages)

		Lack of workforce	High medical cost	Poor personal ability	High education cost	Lack of employment opportunities	Natural disasters	Natural resources are scarce	Lack of road
Area	**Rural**	52.1	52.3	26.2	11.6	8.3	3.2	1.0	1.0
	Urban	44.1	25.5	30.4	22.9	31.1	2.1	1.1	0.8
Gender of household head	**Men**	50.0	48.4	27.3	12.4	11.8	2.9	1.2	1.0
	Women	56.3	49.9	23.9	16.7	9.2	3.8	-	0.9

Note: Based on the 2018 survey, all current and past government-registered poor households
Sample size=514

Besides government allowances, local government also provided various types of assistance to poor households in different forms. About 43 percent of the poor households received government assistance, such as agricultural skills or employment training (11

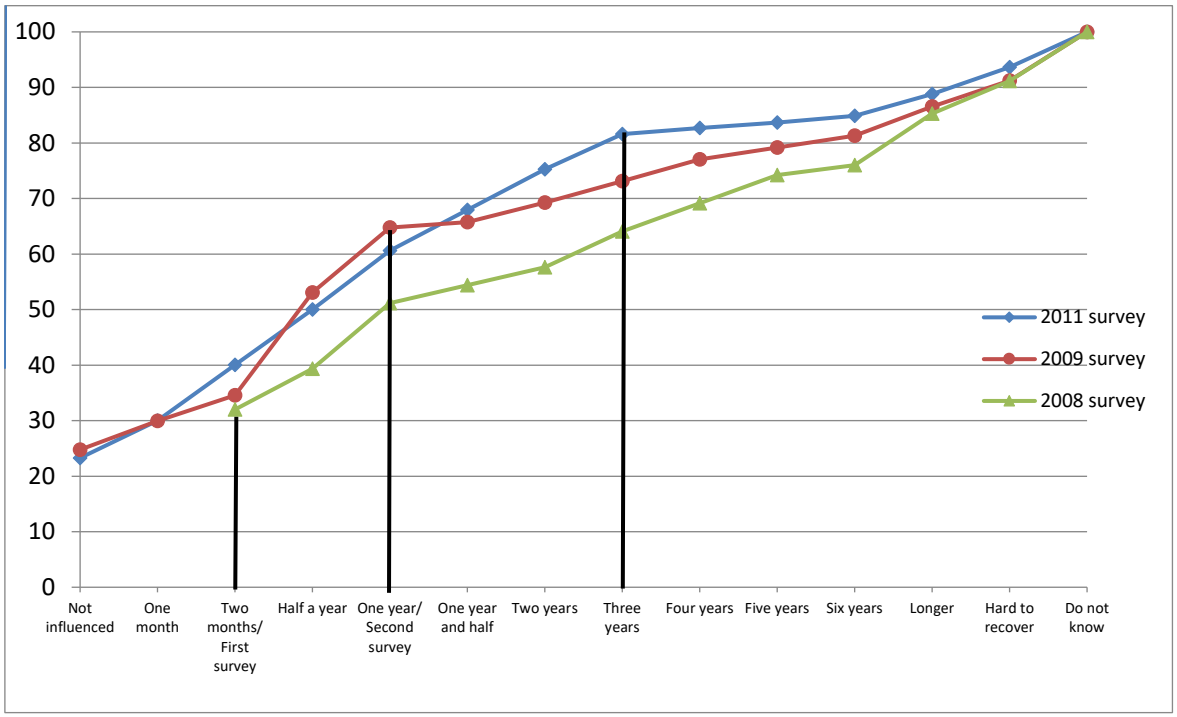
percent), low-interest loans (13 percent), relocation by government (14 percent), farmland reconstruction and building or infrastructure construction (14 percent), job opportunities (9 percent) and help establishing or joining agricultural cooperatives (6 percent).

Economic recovery after the earthquake

The three surveys in 2008, 2009 and 2011 interviewed households in the disaster areas about the impact of the earthquake on their living conditions. Households were asked whether their living conditions had recovered to pre-earthquake levels and when they expected them to recover. Figure 6.4 indicates that the economic recovery of households' living conditions after the earthquake turned out to be more rapid than the households themselves expected. In the 2008 survey, about one-third of the interviewed households did not expect to recover within three years. In 2011, only one in five households in the disaster region had not managed to recover to pre-earthquake levels. However, over the three surveys, the percentage of households that were very pessimistic about recovery was quite stable. About 5 percent of the interviewed households did not believe that their living condition would recover to its pre-earthquake level.

Ten years after the earthquake, 13 percent of all the interviewed households reported that their living conditions had been significantly affected after the disaster. Seven percent of the households had managed to recover over the past 10 years. However, the remaining 6 percent were still struggling and had not yet recovered from the disaster.

Figure 6.4 Households' own perceptions or expectations of household living conditions' reaching pre-earthquake levels (cumulative percentages) in 2008, 2009, 2011



Note: Based on the 2008, 2009, 2011 surveys, all interviewed households
2008 sample size=3,642; 2009 sample size=4,018; 2011 sample size=3,803

7 Social cohesion ten years after

Kristin Dalen

Introduction

In what state do we find the earthquake-stricken societies in Sichuan province ten years after disaster happened? In this chapter, we focus on how relationships between people and between people and institutions in the areas affected by the 2008 Wenchuan earthquake have changed over the last ten years. What is the state of social relations and how, if at all, have they changed since the earthquake hit these societies on May 12, 2008?

We look at relationships between people within their local communities, including social trust, social cohesion and the feeling of unity, the level of participation and social engagement. Further, we look at the relationship between people and the government and other institutions, focusing on feelings of trust in these institutions and satisfaction with performance. Finally, we look into people's satisfaction with life, their expectations for the future and their perceptions of inequalities and possibilities for success.

Some theoretical approaches indicate that societies "build back better and stronger" after major disasters such as the Wenchuan earthquake while others find that disasters significantly weaken societies and that it takes generations for them to get back to the state they were in before the disaster. Concerning the role of social structures in societies' ability to recover after disasters, the level of social capital and trust in a society is pointed to as consequential for its ability to recover (Chamlee-Write, 2010A; Chamlee-Write, 2010B; Chamlee-Write, 2008; Putnam 1993; Aldrich 2012, Buckland and Rahman 1999). Disasters, and recovery from disasters, may contribute to the building of new social infrastructure and the establishment of new social capital, but depending on the way it is organized and implemented, reconstruction may also weaken previous structures and cause distrust and lack of social cohesion.

The unique possibility to compare results from the survey done 10 years after the Wenchuan earthquake with results from surveys done in the immediate aftermath of the earthquake, one and three years after, provides an exceptional database for understanding more about how societies cope with disaster, how they recover, whether they build their social infrastructure "back better" or whether disrupted relationships continue to challenge social cohesion and trust.

Social trust and social cohesion in local communities

Ten years after the earthquake, the feeling of unity in local communities was strong in the earthquake-affected areas. Eighty-seven percent of all respondents agreed that the level of unity in their local community had increased after the earthquake. Compared to the data from previous surveys, the percentage of people who felt that their communities were more united now than they were before the earthquake was stable. One might have expected that the feeling of increased unity would be particularly strong in the relatively immediate aftermath of the disaster, but the data show that the feeling of increased unity seems to have lasted even ten years after.

Trust in other people

Social trust has remained stable, yet we found small nuances over time with regard to trust in strangers and in volunteers (national NGOs). Trust in both NGOs and strangers increased from 2009 to 2011, and since then we have seen some indications of declining trust towards these groups of strangers in the earthquake-affected populations. In 2008 and 2009, people in the most seriously affected areas trusted strangers and volunteers significantly more than people in other affected areas did. This may be due to a stronger presence of both strangers and volunteers in these areas in the immediate aftermath of the earthquake. In 2011 and 2018, we no longer found these differences between very seriously and seriously affected areas.

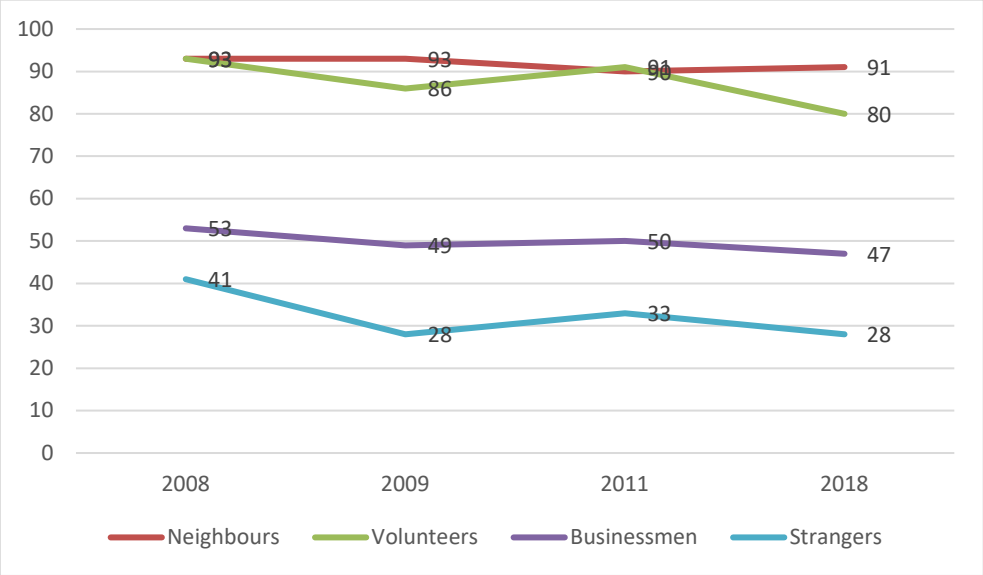
Table 7.1 People who trust groups of others very much or somewhat by level of damage (percentages)

	2008			2009			2011			2018		
	Serious	Very serious	Total	Serious	Very serious	Total	Serious	Very serious	Total	Serious	Very serious	Total
Family	99	98	**99**	99	99	**99**	99	99	**99**	99	99	**99**
Neighbors	93	93	**93**	93	92	**93**	90	90	**90**	91	92	**91**
Volunteers	93	94	**93**	84	93	**86**	90	93	**91**	79	81	**80**
Businessmen	52	57	**53**	49	50	**49**	50	51	**50**	47	46	**47**
Strangers	38	49	**41**	24	38	**28**	33	34	**33**	28	28	**28**

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs
2008 sample size=3,588; 2009 sample size=3,984; 2011 sample size=3,574; 2018 sample size=3,505

The high levels of trust seemed to be echoed in fact that people generally felt respected in their societies; only about 5 percent of respondents indicated that they felt they lacked respect from others in their community (16 percent felt very much respected, the other 73 percent thought that the level of respect was generally ok). Women felt more respected than men and those with education felt more respected than those without, but even among those without education the majority felt that others in their local communities respected them.

Figure 7.1 People who trust others very much or somewhat (percentages)



Note: Based on the 2018 survey, all RSIs
Sample size=3,505

Participation and social engagement

In addition to trust in others and feelings of respect, participation in public activities is an important indicator of how a society is consciously or unconsciously nurturing social capital. In previous surveys of the earthquake-affected population in Sichuan, we found that participation in public activities was highest in the most seriously affected areas right after the earthquake and in 2011. At that time, as much as half the population indicated that they had taken part in such activities. Ten years after the earthquake, one in five said they participated in public activities and there were no significant differences between very seriously affected and seriously affected areas. Nevertheless, there were clear differences between different parts of the population; urban dwellers, young people and those with higher education participated more actively in public activities.

These same patterns of differences between groups in the population were reproduced in terms of whether or not people had helped other people (not including family and friends) for free over the previous 12 months. Young, educated people in the cities were more likely to help others for free.

Table 7.2 People who participated in public activities or helped others for free during the last 12 months (percentages)

		Participate in public activity	Help others for free
Area	**Urban**	27	18
	Rural	19	13
Age	**15–24**	46	28
	25–45	27	21
	46–64	18	14
	65+	14	7
Gender	**Men**	21	15
	Women	20	14
Degree of disaster	**Very serious**	21	12
	Serious	20	15
Education	**No schooling**	11	9
	Completed primary	19	13
	Completed secondary	24	15
	High school	29	24
	Higher education	47	30
All		**21**	**14**
***Sample size*[24]**		***1696****	***1759****

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs

Feeling of unity

Close to nine in ten respondents said that they experienced a higher level of unity in their local communities in 2018 than before the earthquake struck. Even though we found a decrease in the percentage of people who felt that unity was strengthened from 2009 to 2011, we saw that ten years after the earthquake the percentage of people who felt that their communities were more united now than before the earthquake was on the rise again. As with the previous surveys, we found only minor differences between very seriously and seriously affected areas in 2018.

Despite the fact that young and educated people participated to a higher degree in social activities such as public activities and helping others for free, they also agreed the least that the feeling of unity in their communities was stronger now than before. About 20 percent of the youngest cohort disagreed with the statement about increased unity since the earthquake in 2008; this was also the case among those with higher education. That said, 80 percent of both the youngest and the most educated still agreed that their community is more united now that before the earthquake.

[24] Sample sizes marked with * indicates that half of the total sample were asked these questions

Table 7.3 People who agree that the feeling of unity in their community has increased after the earthquake (percentages)

	2009			2011			2018		
	Serious	**Very serious**	**Total**	**Serious**	**Very serious**	**Total**	**Serious**	**Very serious**	**Total**
Totally agree	41	45	42	34	32	33	47	47	47
Somewhat agree	48	43	46	48	51	49	40	41	40
Agree	88	87	88	82	83	83	86	88	87
Sample size			*3938*			*3528*			*1630**

Note: Based on the 2009, 2011, 2018 survey, all RSIs
2009 sample size=3,938; 2011 sample size=3,528; 2018 sample size=1630

Satisfaction with—and trust in—government

In general, we found that people in the earthquake-affected areas were satisfied with the government's reconstruction work after the earthquake. Eighty-three percent said that they were very or somewhat satisfied with the reconstruction work. People in the very seriously affected areas were somewhat less satisfied than people in the seriously affected areas, but in general, the large majority expressed satisfaction with the reconstruction work. The previous rounds of surveys showed that the satisfaction with central government was generally very high, but that people were less satisfied with the performance of local governments.

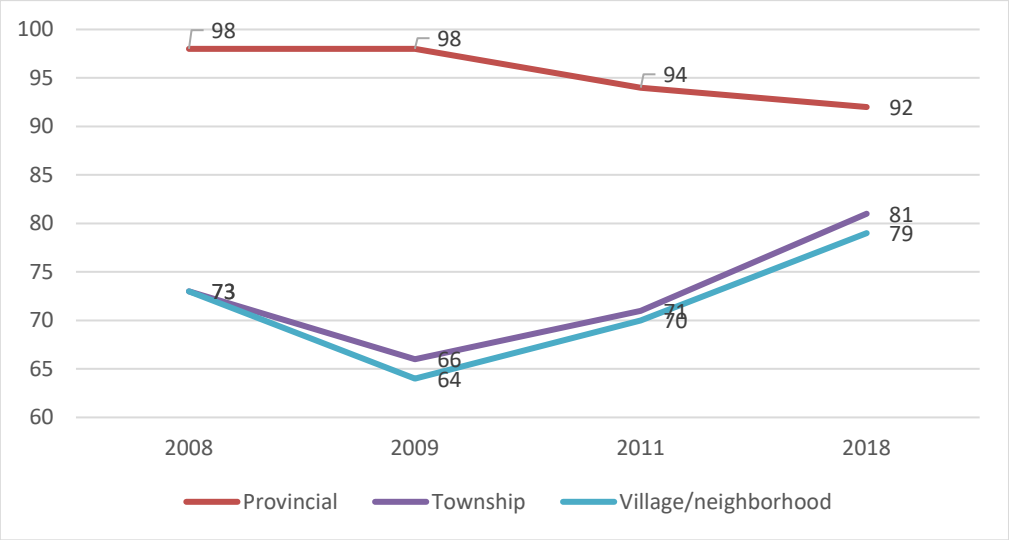
Table 7.4 People who were very or somewhat satisfied by the government's performance during reconstruction (percentages)

	2008	**2009**	**2011**	**2018**
Central	100	99	-	
Provincial	98	98	94	92
County	84	82	-	
Township	73	66	71	81
Village/neighborhood	73	64	70	79

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs
2008 sample size=3,594; 2009 sample size=4,013; 2011 sample size=3,576; 2018 sample size=3,505

Ten years after, the satisfaction with local governments' role in the reconstruction had increased. After the earthquake, especially in 2009, we found that trust in local governments had declined. At that time, many people were still waiting for the reconstruction to be implemented and many experienced problems with the organization of reconstruction efforts. Even though we still found the "inverted paradox of distance" (higher trust in central than local government), trust in township and village/neighborhood governments increased significantly between 2009 and 2018. This was particularly true in the very seriously affected areas, where the level of satisfaction with local government was the lowest in 2009 and 2011.

Figure 7.2 Satisfaction with the performance of different levels of government in the reconstruction (percentages)



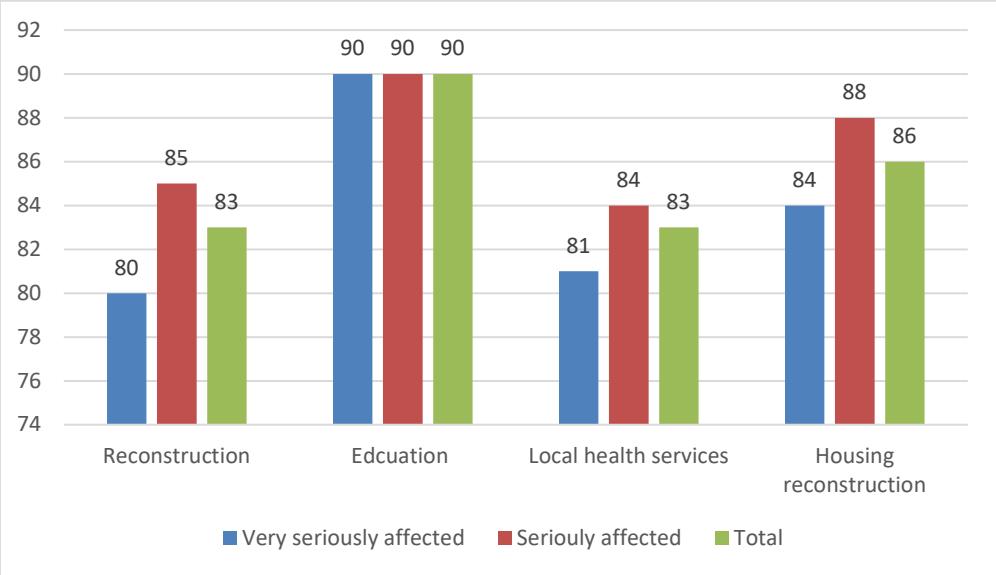
Note: Based on the 2018 survey, all RSIs
Sample size=3,505

Satisfaction with government services

Increased satisfaction with local government delivery of public services has enhanced legitimacy and led to increased trust in local governments all over China over the last 5–10 years (Dalen forthcoming). The expansion of the Chinese welfare state and more centrally financed programs have given local governments more room to deliver social services. This development is also seen in the earthquake-affected areas; one might even assume that some of these reforms were introduced earlier in Sichuan earthquake areas as a part of the general reconstruction efforts (see the chapter on policies).

Overall, we found high degrees of satisfaction with the general reconstruction, housing reconstruction, education and local health services. Our results indicate that people in the most seriously affected areas were somewhat less satisfied that others affected by the earthquake, but the differences were small and the main finding indicated an overall high satisfaction with government reconstruction and service provision. Disaggregating the results across different groups of the population, we found that younger people were somewhat less satisfied with education than their older counterparts, the elderly were somewhat less satisfied than the young about local health services, and villagers were somewhat more satisfied about housing reconstruction then their counterparts in the city.

Figure 7.3 People who are very or somewhat satisfied with government services in their local community (percentages)



Note: Based on the 2018 survey, all RSIs
Sample size=3,505

In both 2011 and 2018, households were asked about their perceptions of the convenience of various services in the community where they currently live compared to where they lived before the earthquake. In 2011, the majority of households believed that services were back to the same level as before or better (Table 7.5). By 2018, more than 70 percent of all households reported that access to shopping, work, transportation, medical care and entertainment was more convenient than before the earthquake, while only 4 percent or less indicated that access to services had become less convenient than before the earthquake.

Table 7.5 Perception of convenience of access to services in the local community (percentages)

	Shopping		Work		Transportation		Medical care		Entertainment	
	2011	2018	2011	2018	2011	2018	2011	2018	2011	2018
Much better	11	48	7	33	17	54	10	40	8	33
Better	35	31	30	37	39	32	37	36	27	37
The same	50	19	56	27	39	11	48	20	63	28
Worse	3	1	5	3	3	2	3	3	2	2
Much worse	1	0	2	1	2	1	2	1	1	1
Sample size	***3735***	***3382***	***3556***	***3045***	***3736***	***3395***	***3704***	***3352***	***2889***	***2791***

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs
The sample size varies for different questions, due to different number of non-responses

Trust in government

Trust in central government remained very high in 2018 and local governments seemed to have regained peoples trust. In 2009 and 2011, we found that trust in local governments was declining. This was particularly true for the very seriously affected areas. In 2009, only one in two respondents stated that they trusted the local government in the very seriously affected areas. Ten years after the earthquake, local governments have experienced an increase in trust from their citizens. Although still lower than trust in the central government, trust in local governments has increased from 51 to 79 percent in the worst affected areas over the last nine years (2009–2018). In 2018 there was no longer a significant difference in the level of trust in local governments between the seriously and the very seriously affected areas. Increased trust in local governments was coupled with higher levels of satisfaction with the performance of local governments as described above.

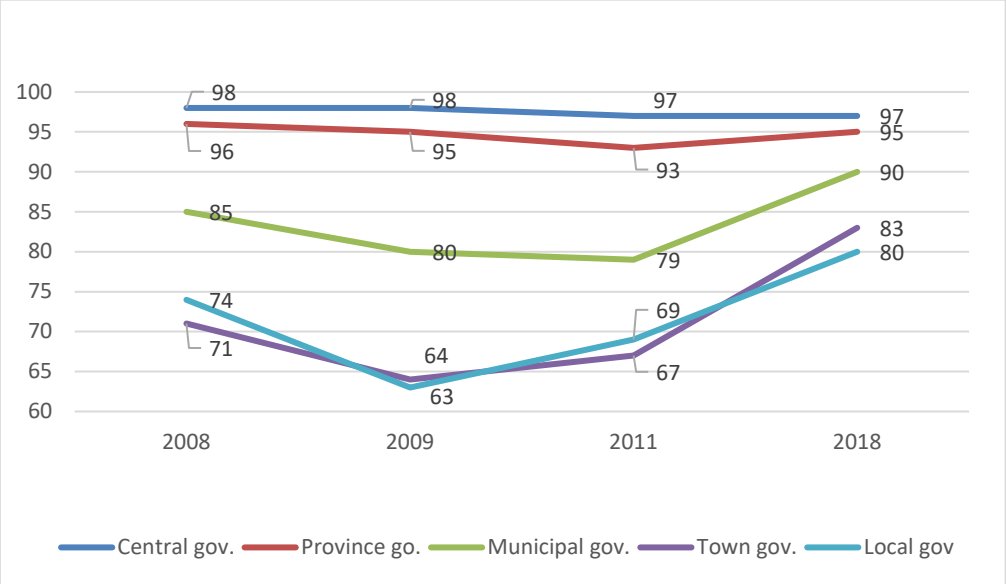
Table 7.6 People who trust government very much or somewhat (percentages)

	2008			2009			2011			2018		
	Serious	Very serious	Total	Serious	Very serious	Total	Serious	Very serious	Total	Serious	Very serious	Total
Central gov.	98	98	**98**	97	99	**98**	98	96	**97**	96	97	**97**
Provincial gov.	97	96	**96**	96	94	**95**	94	92	**93**	95	96	**95**
Municipal gov.	87	78	**85**	83	72	**80**	82	74	**79**	91	90	**90**
Town gov.	73	65	**71**	68	54	**64**	71	60	**67**	82	83	**83**
Local gov.	76	67	**74**	67	51	**63**	73	61	**69**	80	79	**80**

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs
2008 sample size=3,588; 2009 sample size=3,984; 2011 sample size=3,574; 2018 sample size=3,505

Over the ten-year period from 2008 to 2018, the legitimacy of local governments has been strengthened; the reconstruction efforts in the area may have contributed to this, yet other important developments may have also had an effect on perceptions of legitimacy. The central government has initiated substantial reforms to improve local governments' ability to deliver services to their constituencies. Reforms of financing mechanisms and more dedicated funds from the central government have strengthened local governments' ability to provide basic services such as education, basic health care, and poverty alleviation measures

Figure 7.4 People who trust different levels of government very much or somewhat (percentages)



Note: Based on the 2018 survey, all RSIs
Sample size=3,505

Satisfaction with life and perceptions about the future

Satisfaction with life is high in the earthquake-affected areas in 2018. Close to nine in ten of the population reported being satisfied with their current lives. Beyond being pleased with their current life, the vast majority of people said they were happier now than they were five years ago. Only 4 percent said that they were less happy than they were five years ago, while 15 percent thought their situation was about the same and 80 percent were happier at the time of the last survey. People in the earthquake-affected areas indicated overwhelming optimism about the future. Eighty-seven percent thought that they would be even more happy five years from now, 11 percent thought that their situation would be somewhat the same and only 2 percent thought that they would be worse off in five years than they are now. In the immediate aftermath of the earthquake, we found that people in the most seriously affected areas were somewhat less optimistic about their future than those in the seriously affected areas. By 2018, there were only minor differences between the different areas. In the previous surveys, we also found that young people were significantly less optimistic about the future then their parents and grandparents. In 2018, we still found the oldest cohorts to be the most optimistic, but the youth had become significantly more optimistic than they were right after the earthquake.

Table 7.7 Perople who are satisfied with their current lives (percentages)

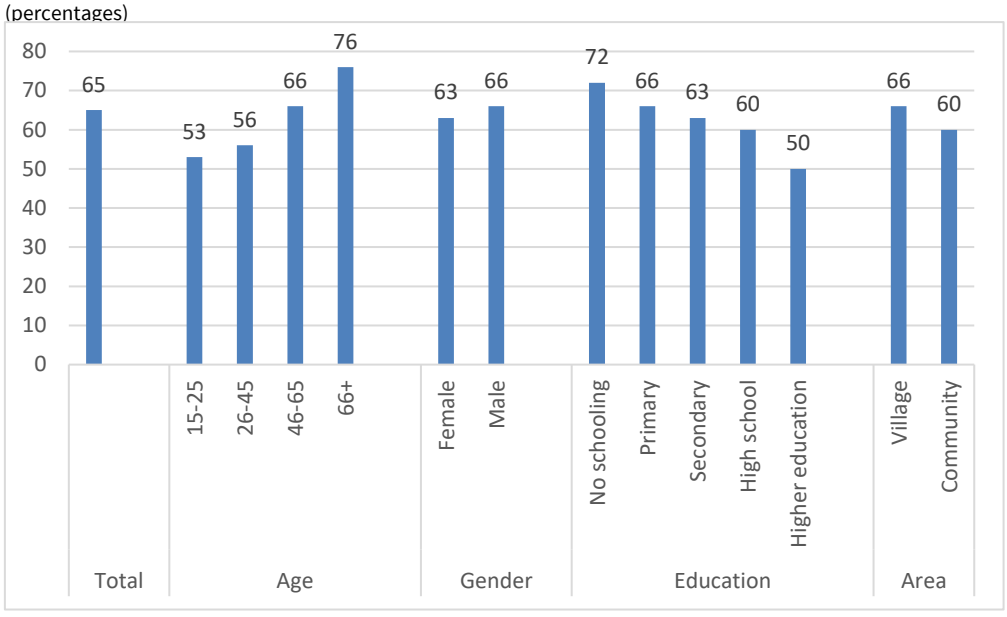
		2008	2009	2011	2018
Degree of damage	**Serious**	84	82	83	88
	Very serious	75	74	82	85
Area	**Rural**	84	82	84	87
	Urban	74	74	78	88
Age group	**16–24**	73	80	76	86
	25–64	80	79	81	86
	65+	89	86	89	90
Gender	**Male**	83	81	83	87
	Female	81	78	82	88
All		***82***	***80***	***82***	***87***

Note: Based on the 2008, 2009, 2011, 2018 survey, all RSIs
2008 sample size=3,575; 2009 sample size=3,992; 2011 sample size=3,556; 2018 sample size=3,505

Opportunities for all to be successful

There were clear differences across population groups when it came to the belief in equal life chances in the earthquake stricken areas. Even though the results were the same in the seriously and the very seriously affected areas, there was a clear difference between elderly and younger people. Young people had much less faith in equal opportunities. Whereas 76 percent of those 65 years or older agreed to the statement about equal opportunities, only 53 percent of those 24 or younger felt the same way.

Figure 7.5 People who agree that all people have the same opportunities to succeed in today's society (percentages)



Note: Based on the 2018 survey, all RSIs
Sample size=3,505

These perceptions are also mirrored in the differences between those with high and low education. The higher their education level, the less optimistic people were about equal life chances. Only one in two college graduates thought that everyone enjoys the same chances to succeed in life.

Perceptions of inequality

One in four respondents thought the gap between rich and poor in their own community was a very serious problem. We found no significant differences between people in urban and rural areas, between women and men, or between very seriously and seriously affected areas. Yet it was clear that more people above 45 and those without higher education saw inequality as a very serious problem in their communities. On the other hand, the socially active highly educated youth, who had less faith in equal opportunities for all, did not express as much concern about social inequality as their elderly counterparts. Nineteen percent of those under 45 saw the gap between rich and poor as a very serious problem, compared to 28 percent of those above 45. Seventeen percent of those with higher education saw the gap as a serious problem compared to 27 percent of those with secondary or lower education. It is important to be aware that the education and age variables are linked in that more young people have higher education, indicating that education may to some degree be a proxy for age.

Asking whether inequalities were on the rise in the earthquake-affected areas, we found that half of the respondents thought that the differences between rich and poor in their communities had gotten bigger since 2008, whereas one in four thought the gap had decreased.

The results from the survey also showed that people think that there is a real risk of danger if the gap between rich and poor continues to grow. Sixty percent saw a continued rise in inequality as a serious or very serious danger to society. To many, this is not a theoretical danger: 42 percent of the population saw rising inequality as likely or very likely to happen in the near future. These perceptions lend legitimacy to the government's focus not only on developing policies to eradicate extreme poverty but also on securing more equal opportunities and basic services for the population.

8 Resilience and risk reduction

Mona Christophersen

Disaster risk reduction in China

China's frequent exposure to disaster has historically put relief policies aiming both to offer aid to victims and to maintain social stability high on the agenda. Since the founding of the People's Republic of China, disaster management has continued to be a government priority. In the introduction to this report, we identified four main phases in China's management of disaster response since 1949. While the three first phases mainly focused on relief and recovery after a disaster has happened, the last and current policy aims to shift from the previous passive response to disasters towards disaster risk management and prevention. Disaster risks include the potential loss of life or injury as well as damaged assets as a result of vulnerability of natural disasters (UNISDR 2017)

When the United Nations launched its International Decade for Natural Disaster Reduction in 1989, China's government responded by setting up its own committee in charge of disaster risk reduction (Ke et al. 2015). This committee became the National Commission for Disaster Reduction in 2015 and the country has committed to the Sendai Framework for Disaster Risk Reduction, which replaced its predecessor, the Hyogo framework, in 2015.[25]

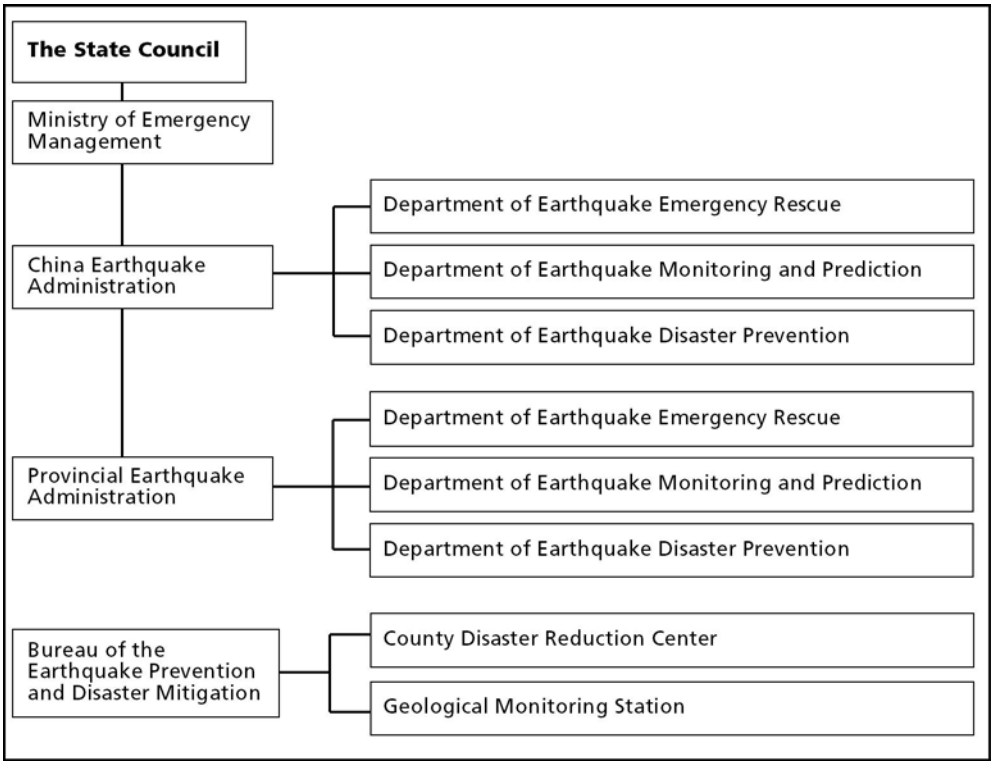
Under these frameworks, China has developed policies and legislation for disaster prevention and impact reduction. The devastating impact of the 2008 Wenchuan earthquake contributed to a renewed effort to reduce disaster risk, with a particular focus on significantly reducing the number of casualties and the economic loss caused by disasters, increasing people's awareness and knowledge about disasters, and developing sophisticated mechanisms for disaster reduction. Ke and colleagues attributed the limited number of casualties in the 2014 Ludian earthquake (Sichuan province) to these policy changes (Ke et. al. 2015). However, this assumption might be somewhat simplistic as the Liudan earthquake was much less destructive than the Wenchuan earthquake. Further, the timing of the Liudan earthquake meant that fewer children were in school, while the timing of the Wenchuan earthquake was devastating for schoolchildren.

[25] In 2005, governments around the world committed to take action to reduce disaster risk and adopted guidelines to reduce vulnerabilities to natural hazards called the Hyogo Framework for Action. At the third World Conference on Disaster Risk Reduction in Sendai City, Japan, 2015, UN Member States adopted the Sendai Framework for Disaster Risk Reduction 2015–2030, a concise, focused, forward-looking and action-oriented framework for disaster risk reduction, see https://www.preventionweb.net/english/hyogo/framework/

China's earthquake and risk management

China used to organize its disaster management by disaster type and the National Earthquake Relief Headquarters was in charge of all matters related to earthquakes such as monitoring hazards, developing warning systems, and implementing rescue and recovery. In April 2018, China established the Ministry for Emergency Management, replacing the National Emergency Office at the State Council. As of May 2018, the extent of the new ministry's mandate is not clear; the state councilor is expected to announce assignments and tasks for the new ministry in June.

Figure 8.1 The new political structure for Chinese disaster management:[26]



China's Earthquake Administration is the implementing body of earthquake management policies. It is responsible for formulating strategies, guidelines and policies, and laws and regulations for disaster mitigation, including earthquake prediction and preparedness initiatives, emergency response plans for destructive earthquakes, and recovery and reconstruction in disaster areas.[27]

Although disaster risk reduction is more frequently mentioned as a priority for disaster management, one disaster management expert warned that improvement in this area continues to be limited.[28] The expert claimed that budgets for preparedness and prevention, for example, are limited, which indirectly encourages provincial and local governments to focus more on relief and recovery where funds from the national budget are

[26] Courtesy of Yang Xinmeng, CASTED
[27] China Earthquake Administration, available at: http://english.gov.cn/state_council/2014/10/01/content_281474991089800.htm
[28] Interview with disaster management expert, Beijing 10th April 2018.

available. The expert further said that the name of the new ministry, "emergency management," indicated that the focus would continue to be on emergency and crisis management. Preparedness and prevention will be included, but are not yet expected to reach the same systematic level found for relief and recovery.

Earthquake prevention and preparedness

Earthquakes have proved very difficult to predict, which was also valid for the Wenchuan earthquake. The high number of casualties and the scale of destruction impelled the Chinese government to focus more on disaster risk reduction and prevention. Since 2007, China has issued national plans for comprehensive disaster risk reduction. The latest plan spans from 2006 to 2020 and focuses on people's safety and protecting economic development while adopting a policy of putting prevention first. The aim is to strengthen all three phases in the disaster cycle: earthquake monitoring and pre-warning, prevention, and rescue, recovery and reconstruction.

The establishment of the earthquake assessment network is an important achievement in the country's earthquake prevention efforts. This is a network monitoring seismic activity all over China. By using artificial intelligence, the government, press and other relevant stakeholders can get vital information about any earthquake within two minutes. This includes the location of the earthquake on a map, the earthquake's magnitude, and an assessment of rescue needs. For comparison, it took 20 minutes to disseminate this information after the Wenchuan earthquake. It is claimed that this improvement has significantly enhanced the emergency response in critical situations where time is a life-saving factor.[29]

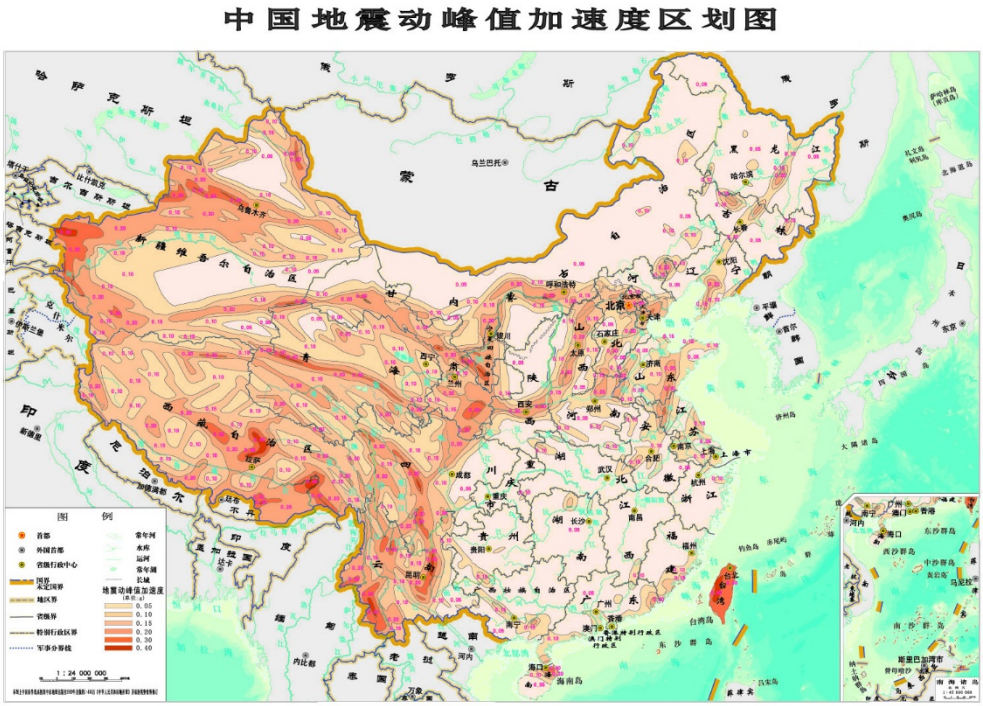
The second improvement is an update of a more detailed map of earthquake risk in China. The map has color codes for areas or zones with different levels of risk. By including new standards for risk indicators, the risk areas both expanded and got more detailed. For example, the Wenchuan earthquake, which had a relatively low risk of happening, had disastrous consequences when it happened, so the area has been marked as a high-risk area in the new map. The zoning map thus suggest criteria for building standards that correspond to the level of risk in each area. If there is a low risk of earthquakes in an area, the building standard can be simpler than for an area with higher risk of earthquakes or risk of high magnitude earthquakes.[30]

It is important to have good risk analysis and follow up with regulations for building standards, which in itself is a good preventive policy to reduce the risk of loss of life and destruction of property. Another thing is control mechanisms guaranteeing that the standards and regulations are met. All public buildings such as schools, hospitals and government buildings, as well as "high-occupancy" buildings such as high-rise apartment buildings, malls, and stadiums, need building permits and have improved systems for controlling that they are built according to the required standard. Yet in rural areas where households themselves are constructing private dwellings, it is more challenging to enforce that they follow a certain standard.

[29] Interview with disaster management expert, Beijing 13th April 2018.
[30] Interview with disaster management expert, Beijing 13th April 2018.

Figure 8.2 Zone map for earthquake risk by China Earthquake Administration

The map uses color codes specifying the risk of destruction from earthquakes; light yellow color indicates low risk of destruction and dark red color indicates high risk of destruction from earthquakes. Zones with a high risk of destruction will have building codes calculated to withstand earthquakes up to a designated magnitude on the Richter scale, while areas marked with lower risk can use a simpler building code.



One reason that families in poor rural areas do not follow the recommended standard when building new houses is that following the standards makes it more expensive to build. To encourage earthquake-resistant building methods, the central and local governments jointly initiated some financial aid projects. These projects have been only partly successful. The co-funding method requires that the local government raise money for the needed subsidies. The result is that interest and willingness to participate in such programs will differ from county to county according to their economic situation. Further, the county government also has to raise money and resources to spread information about the program in every village under their jurisdiction.

Disaster awareness at the household level

Our survey of 2018 included some questions about disaster preparedness for the first time. Questions on knowledge of the location of the main switch for gas, electricity, and water in the home and knowledge of the exit of the house in an emergency found very high awareness. More than 90 percent of respondents claimed to have this knowledge regardless of urban/rural location, gender, or education level. These are important survival skills in the case of an emergency.

The survey also found high awareness in the case of having emergency lights or flashlights available in the house. Nearly 80 percent of the households were prepared in this way. Again, the survey found few differences between urban and rural households or between genders, but found that preparedness increased slightly among respondents that had completed any level of education compared to those without such educational

achievements. However, anticipated power cuts might also explain the handy availability of flashlights.

Preparedness in the form of two or three days' worth of stored water and food is also relatively high at almost 70 percent. Again, there is higher awareness among respondents that have completed any level of education compared to those that have not. Only 61 percent in the last category reported having stored food and water in preparation for a disaster. We also found slightly higher preparedness in the rural population and more preparedness among women than among men. This can be explained by rural household's self-production of food, and that women take more responsibility for food in the household.

Emergency preparedness in the form of an emergency package (first aid kit), a radio with extra batteries, and a fire extinguisher is low; between 10 and 14 percent of the households had prepared in this way. More urban families, 21 percent, had prepared first aid kits than rural households, of which 12 percent had done the same. There are no gendered differences related to the preparation of emergency packages, but awareness of the importance of doing so seems to increase with the level of education. Among families with higher education, 25 percent had prepared emergency packages, while only 9 percent of primary education level families had done the same. These findings reveal that there is a need to raise awareness around emergency preparedness.

Keeping a radio with batteries for an emergency is not very common and there are no significant differences between gender or between rural and urban households. There are some differences related to education level with the highest preparedness found among those with senior secondary education at 14 percent, with only 9 percent of families with higher education having the same preparation. Overall, these findings indicate that most people rely on different sources of information in the case of an emergency, such as TV.

Not many families keep a fire extinguisher in their house, although more urban families do so (16 percent) than rural ones (8 percent). Again, it is the families with members that have completed senior secondary education that are best prepared at 17 percent, compared to only 5 percent among those whose members have not completed any level of education. Keeping a fire extinguisher is important not only in the case of a natural disaster, but also to prevent the spread of any house fires. This is thus another area in need of more training and awareness raising.

Table 8.1 Preparedness at the household-level (percentages) [31]

		Emergency lights or flashlights	Water and food for two or three days	Emergency package	Radio with battery	Fire exting uisher	Knowledge of the location of the main switch of gas, electricity or water in the home	Knowledge of the exit of the house in an emergency
Total		**78**	**67**	**14**	**10**	**10**	**93**	**93**
Area	**Rural**	78	68	12	10	8	92	93
	Urban	79	63	21	12	16	94	94
Gender	**Men**	79	65	14	12	10	95	95
	Women	78	68	14	9	9	91	92
Highest completed education	**No school completed**	74	61	12	9	5	89	90
	Primary	80	69	9	11	7	96	94
	Junior secondary	80	69	16	10	15	95	95
	Senior secondary	82	71	23	14	17	94	98
	Higher education	79	69	25	9	12	92	98

Note: Based on the 2018 survey, RSIs
Sample size=1,703

Disaster preparedness at the community level

China's approach to disaster risk reduction includes decentralization of responsibilities and community participation. As a result, many communities are increasingly involved in addressing disaster risk. Activities include providing education in survival skills and disaster risk reduction, identifying vulnerable groups in the community, developing local disaster risk maps, localizing evacuation routes and emergency meeting points, equipping emergency shelters, and implementing disaster prevention drills.

Our survey found that knowledge of the location of the emergency shelter nearest to the house is common among 46 percent of the households. More urban than rural households have this knowledge, 51 percent and 46 percent respectively. There is also a gendered difference with 49 percent of men knowing the location of the nearest emergency shelter compared to 43 percent women. More than 50 percent of those who had completed secondary education or more knew where the nearest shelter is, while only 36 percent of those who never completed any education had this knowledge.

Although community leaders are increasingly concerned about emergency preparedness, only 16 percent of our respondents had participated in any emergency or training drills. Such drills are more common in urban neighborhoods where 25 percent had such experience than in rural areas where only 13 percent had. A few more men (18 percent) had participated in emergency drills men compared to women (14 percent.) The likelihood of participating in emergency drills increased with education; only 6 percent of those that never completed any level of education had participated in training or drills, while 52 percent of those with higher education had this experience. One reason for this difference could be that schools are a common venue for both emergency training and exercise drills, reflecting the need to do drills in other contexts such as villages and private homes.

[31] Half of the total sample were asked these questions.

Table 8.2 Preparedness at the community level (percentages) [32]

		Knowledge of the nearest emergency shelter to the house	Ever attended any emergency training or drills	Ever discussed about what to do in case of an earthquake	Volunteer of the community, the Red Cross or other organizations
Total		**46**	**16**	**44**	**3**
Area	**Rural**	44	13	42	3
	Urban	51	25	50	4
Gender	**Men**	49	18	42	4
	Women	43	14	46	2
Highest completed education	**No school completed**	36	6	37	1
	Primary	46	6	42	2
	Junior secondary	53	20	48	3
	Senior secondary	54	35	54	7
	Higher education	53	52	63	12

Note: Based on the 2018 survey, RSIs

Sample size=1,703

Discussions about what to do in case of an earthquake took place more often than training drills, drawing 44 percent positive answers from our respondents. These discussions were more common in urban than in rural places (50 and 42 percent), and took place more often among women than among men (46 compared to 42 percent). Discussions about what to do in case of an earthquake also increased with the level of education, starting at 37 percent among those who have never completed any level of education and reaching 63 percent among those with higher education. This reflects that the general level of awareness increases the chance of discussing and preparing for emergencies.

Volunteering in the community, for example with the Red Cross or other organizations, remains limited, with a level of participation of on average 3 percent. There is however, an increased chance that a person has had this experience when the person has more education, reaching 12 percent among those that have completed higher education

Risk of disaster can be transferred to third parties, for example to insurance companies. This option, however, is only available to private persons or private companies; the government does not have this option and has to deal directly with the risk (Olson and Wu 2010). Some communities are also included in different natural disaster insurance programs. Currently there are five cities in different provinces, which have joined these programs: Dali in Yunnan, Shenzhen in Guangzhou, Ningbo in Zhejiang, Xiamen in Fujian, and Chongqing in Sichuan.[33] In Dali, the insurance is officially financed and costs 10 RMB per year, which covers damage to the house caused by earthquake. In Shenzhen, however, there is a joint public/private insurance program, which costs more but covers all natural disasters and includes human injuries as well as damage to property. The insurance model is complex and available through different packages according to individual needs. These variations indicate that there is further need to streamline insurance programs for natural disasters in China.

[32] Half of the total sample were asked these questions.

[33] Interview with disaster management expert, Beijing 13th April 2018.

Our survey found that the willingness to buy insurance to cover losses in the event of a new earthquake is 62 percent, with no significant variation between genders. There is slightly more interest in buying insurance in the very seriously affected areas compared to the seriously affected areas (64 percent and 60 percent) and, similarly, there is more interest among rural households than urban households (63 percent and 58 percent). There is also a tendency to be more interested in insurance among those with a higher level of education, starting at 57 percent for those that have never completed any level of education and up to 71 percent for those with a higher education.

Table 8.3 Willingness to buy insurance (percentages) [34]

		Yes	No	Total
All		62	38	100
Degree of disaster	**Seriously affected area**	60	40	100
	Very seriously affected area	64	36	100
Area	**Rural**	63	37	100
	Urban	58	42	100
Gender	**Men**	62	38	100
	Women	61	39	100
Highest completed education	**No school completed**	57	43	100
	Primary	59	41	100
	Junior secondary	66	34	100
	Senior secondary	61	39	100
	Higher education	71	29	100

Note: Based on the 2018 survey, RSIs

Sample size=1,448

The last finding is interesting when considering the answers to the question on reasons for not buying insurance. About 18 percent said they lack trust in the insurance companies. This lack of trust also increased with the level of education. While 13 percent of those without completing any education cited lack of trust as a reason for not buying insurance, 37 percent of those with higher education gave the same reason. These two last seemingly contradictory answers indicate that level of education not only has implications for awareness of the availability of insurance programs but also instils some critical thinking as to whether these insurance programs are beneficial for the insured or the insurance company.

Lack of trust in the insurance companies also tends to increase in the less affected area where 20 percent lack such trust compared to 15 percent in the very serious affected areas. Urban people similarly tend to have a greater lack of trust than rural people do (29 percent and 16 percent). Further, 22 percent of men reported being skeptical towards the insurance companies, while 14 percent of the women shared this lack of trust.

This lack of trust corresponds somewhat with the (lack of) knowledge on disaster insurance and 13 percent gave this as the reason for not buying insurance. The tendencies are the same as for lack of trust in the insurance companies; there is more knowledge

[34] Half of the total sample were asked these questions.

about insurance in the less serious affected areas, in urban households, and among people with education. For gender, however an opposite tendency appears as 20 percent of the women said they lack this knowledge and 14 percent of the men said the same.

Around 30 percent said they could not afford the insurance, with more reporting this to be the case in the very seriously affected areas than in the seriously affected areas (40 percent compared to 27 percent). Rural households found the insurance less affordable than urban households do (35 percent compared to 21 percent). In addition, more women found it difficult to afford the insurance than men did (34 percent vs 28 percent). Moreover, the households with little education found insurance too expensive: 48 percent of households with no members having completed any education found the insurance unaffordable, while only 2 percent of those that have completed higher education felt the same.

Few people (13 percent) found that insurance is not necessary because they do not expect another disaster, and even fewer (1 percent) agreed that insurance is not necessary because the government will cover all their losses in the event of a new disaster.

Table 8.4 Reason why not willing to buy insurance (percentages) [35]

		Not familiar with insurance	Not trust the insurance company	Could not afford the insurance	Do not think there will be a disaster	With the governmental relief, insurance is not needed	Others	Total
Total		17	18	31	13	1	20	100
Degree of disaster	**Seriously affected area**	19	20	27	13	1	20	100
	Very seriously affected area	12	15	40	13	2	18	100
Area	**Rural**	15	16	35	15	1	18	100
	Urban	22	25	21	8	1	24	100
Gender	**Men**	14	22	28	13	1	21	100
	Women	20	14	34	12	1	18	100
Highest completed education	**No school completed**	15	13	48	10	2	12	100
	Primary	23	16	26	16	1	18	100
	Junior secondary	12	24	24	15	2	24	100
	Senior secondary	16	19	21	13	-	31	100
	Higher education	22	37	2	8	-	31	100

Note: Based on the 2018 survey, RSIs who were not willing to buy the insurance

Sample size=541

Mitigating risk and building resilience

Because of its size and complex geological conditions, China is very vulnerable to natural disasters such as earthquakes. The country has been taking a comprehensive approach to disaster management for more than 25 years, including centrally coordinated responses to rescue and reconstruction and disaster risk reduction. Yet since the experience of the

[35] Half of the total sample were asked these questions.

devastating earthquake in Wenchuan in 2008, there is a growing recognition of the need to mitigate risk and reduce the impact of disasters. By mitigating risk, we mean minimizing the negative impacts of natural disasters, such as earthquakes (UNISDR 2017).
Much had been done in the field of disaster risk reduction, particularly in the field of rapid information sharing on earthquakes. The development of the zoning map for earthquake risk has further increased the government's ability to enhance building standards according to risk level in different areas. Solid buildings are perhaps the most important way to reduce the loss of life and property during an earthquake. If buildings can withstand earthquakes with high impact, there is less need to plan evacuation routes and disaster meeting points. There will also be reduced requirements for emergency equipment and contingency plans for rescue and reconstruction.

Another important factor in mitigating risk is to work more closely with local populations, particularly on spreading information about disaster and what each individual and household can do to prepare for the event of a disaster. As a signatory to the Sendai and Hyogo frameworks for disaster risk reduction, China has endorsed community-based disaster risk reduction in its 11th, 12th, and 13th five-year plans for comprehensive disaster risk reduction (Sim et.al. 2017). Community-based disaster risk reduction aims at transforming passive community members into action and resilience. Usually such frameworks imply initiatives and knowledge generated in the community, while the Chinese model follows a top-down, government-led approach, which mostly is excluding local governments and communities from the decision-making processes.

The aim of disaster risk reduction policies and programs goes beyond mitigating risk to building resilience. As Judith Rodin (2014) claims, when living in a world that is defined by disruption, building resilience becomes urgent. By managing disruption, individuals and societies not only become better able to respond to disasters but also develop better capacity to bounce back from the crisis, to learn from it, and to adapt and transform. In Sichuan, 10 years after the earthquake, we find that many lessons have been learned; schools and other public buildings have been improved and are more earthquake resilient, and there is more awareness of disaster risk prevention among leaders and common people. In a community exposed to earthquakes, these are all important steps to manage risk and build resilience.

9 Success, failure, or something in between?

Jon Pedersen

The government reconstruction plan for the Wenchuan earthquake established that the major reconstruction should be finished within three years of the earthquake and that "the basic living conditions and economic conditions should reach or surpass the pre-disaster level" (Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction of the Earthquake Relief Headquarters under the State Council 2008). It stipulated that reconstruction should take be carried out respecting the principle of people first; respecting ecological constraints, protecting farmland and increasing agricultural output; taking advantage of innovation; and making the natural and social environment as safe as possible in preparation for future disasters.

It is easy to find success stories: By 2011, less than 1 percent of the surveyed households were still living in temporary houses or tents. In comparison, two months after the quake, 46 percent of the households were living in temporary shelters.

Electrification had already taken place in the western regions of China before 2004, and practically all households in the earthquake area had electricity by that time. While many villages had lost their supply during the earthquake, nearly all had their supply restored within a week after the quake (see the chapter on housing and infrastructure). Whether or not there was a house to restore the electricity to was, of course, another issue. Of those in temporary housing, 62 percent had access to electricity two months after the quake, while overall, 83 percent had electricity in their homes.

In contrast, two months after hurricane Maria hit Puerto Rico in September, 2017, more than half of the population were without power (Lu and Alcantara 2018). It is true that the demand on the power grid from each consumer in Puerto Rico is much larger than it was in Sichuan. In 2004, the power grid in villages in Sichuan basically served lighting needs, whereas now in 2018 it also serves a large number of electric appliances, including power-hungry ones such as air conditioners (Table 9.1). Thus, the unchanging 100 percent electricity coverage hides an important expansion of the grid's capacity.

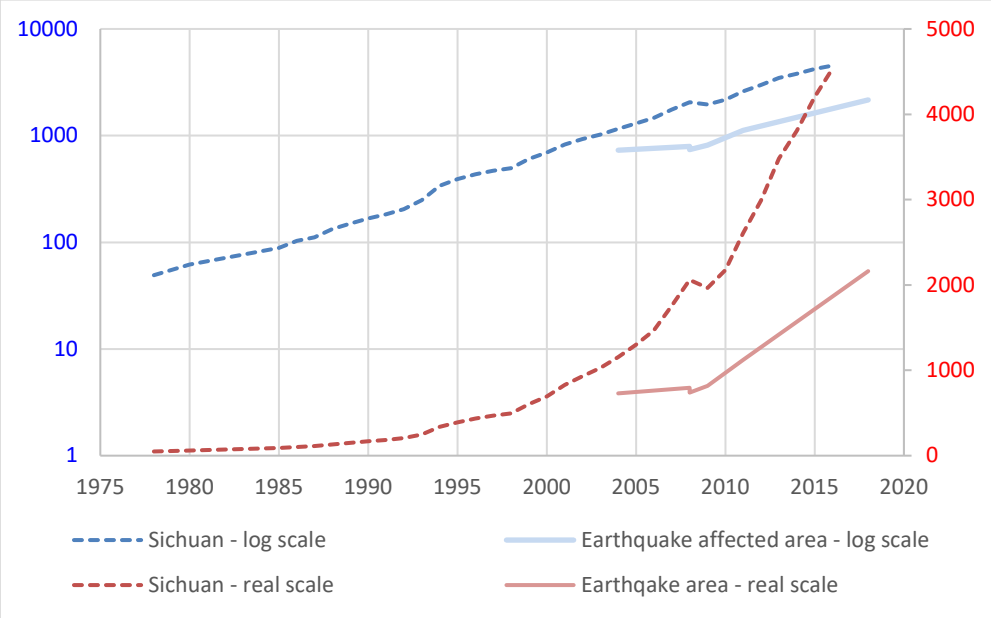
Before the earthquake, there had been rapid socio-economic development in the area that was to be affected by the earthquake (Figure 9.1).

Average wages outside of the agricultural sector also increased rapidly, both before and after the earthquake, except in 2008. However, before the earthquake, the wages appear to have increased more rapidly in Sichuan than in the earthquake-affected area. This is most easily seen on the log scale in the plot in Figure 9.1 (which indicates the growth rate with a solid line) where the earthquake area appears quite stagnant before 2008 but nearly catches up with the overall growth rate after the earthquake. However, on the real scale it is clear that the difference in wages between the earthquake area and Sichuan increases, partly because of a higher starting level in Sichuan overall, and partly because of a slightly higher growth rate.

Table 9.1 Some characteristics of infrastructure and possessions 2004– 2018

Characteristic	2004	2011	2018
Improved drinking water (tap or covered well)	61	83	89
Electricity	100	100	100
Private flush toilet (not shared or public)	34	55	74
Refrigerator	12	70	90
Washing machine	27	76	89
Drinking water dispenser	6	49	58
Air conditioner	4	16	44
Car	2	11	30
Motorcycle	19	47	49
Computer	2	22	38
Median number of rooms in dwelling	3	4	4

Figure 9.1 Development of monthly wages, Sichuan and the earthquake-affected area



Note: Sources – Sichuan: Sichuan Statistics Office 2017, Earthquake area: CASTED/Fafo Surveys

Thus, in terms of wages (and indeed generally) the earthquake area was a backward area in Sichuan when the earthquake struck, and despite material growth it was rapidly falling farther behind, both absolutely and in relative terms. Nevertheless, after the earthquake, the growth rate in wages in the earthquake-affected area picked up to nearly the level of Sichuan, creating a situation in which the relative difference in wages remained similar while the absolute difference increased.

The overall reconstruction plan emphasizes a focus on work: every household is meant to have at least one family member in a stable job and that the income is supposed be

higher than before the disaster. As discussed above, as well as in the chapter on labor, wages have now increased beyond the pre-disaster level. Moreover, there was full employment in 2018 and, as the wage data show, pressure on wages.

Notwithstanding the stated policy and these positive developments, there was a drop in labor force participation, especially among women (see the labor chapter). Indeed, from an overall labor force participation of 81 percent in 2004 there was a fall to 58 percent in 2018. Some of this decline happened before 2008, and the participation was stable in the first two years after the earthquake, possibly because of the need for workers in the earthquake-affected area.

There are probably several reasons for the decline in labor force participation. One is the general aging of the population combined with improved economic conditions for retired people because of the introduction and expansion of retirement schemes, medical insurance, and anti-poverty programs. Thus, the senior part of the population has increased in size while their participation rate has dropped. Another reason is the high migration rates from the earthquake area—around half of the surveyed households include a person that is considered a household member who has migrated. Thus, many people that could have been counted in the labor force were not present. Yet another reason for the drop in labor force participation may be the shift from away from agriculture to other types of jobs, although this may simply be a consequence of the overall reduction in farming that seems to have taken place.

There have also been improvements outside of the economic field. The destruction of a large number of schools necessitated a major rebuilding program, which was largely complete by 2010 (Yong and Booth 2011: 237). The schools were, to a considerable extent, rebuilt in place or in the new location a community was moved to, as evidenced by the fact that the percentage of children attending boarding schools remained relatively constant between 2008 and 2018. In 2009, three quarters of the surveyed parents said that the travel time to school had not changed after the earthquake. Still, around half of the primary and junior high school students attended boarding schools.

School enrollment improved slightly between 2008 and 2018, but was already at around 95 percent in 2008 for primary and junior high school (the compulsory levels) and is now nearly 100 percent. It is, however, difficult to ascribe this to the rebuilding efforts after the earthquake, since it also must be understood in the context of the general improvements in China's education system.

Health offers a similar story to that of education in that there was a concentrated effort to rebuild destroyed hospitals and other health facilities. However, in contrast to the number of schools, which did not need to be increased in because of the falling number of children, the number of hospital beds was increased and the quality of hospital facilities upgraded (Yong and Booth 2011: 239).

The increase in the number of hospital beds and the improvements of equipment have not translated into significantly higher utilization rates of the health services since the earthquake. (See the chapter on health.) Thus, the field of health is also like that of education in that it is difficult to find any earthquake-specific effects on the development trends. As was the case for education, the earthquake did not set in motion negative trends in health care that were left unaddressed during the reconstruction. The main policies appear to have been rebuilding infrastructure and then following the policies for reform of the respective sectors. However, appreciation of the services among the population seems to have improved: as many as 76 percent of respondents considered that the convenience of utilizing health services had improved since the time of the earthquake.

A key point in the overall plan for reconstruction was to ensure safety and quality in the reconstruction projects. As discussed in the chapter on resilience and risk reduction,

many of the responses to the Wenchuan earthquake were on the national level in the form of risk mapping and modifications of laws and regulations.

Despite the central efforts, and despite some efforts to instigate and implement risk awareness strategies and knowledge on the local level, about 3 percent of the houses in the earthquake area were lost or have remained damaged during the 10 years that have passed since the earthquake. That level of loss, however, is lower than what was found in the western regions of China in 2004, where around 4 percent of the households had lost their house due to natural disasters in the five years preceding the survey.

How does this relate to the discussion in the introduction of "building back better" and the other scenarios of creative destruction, recovery to trend, no recovery, and progressive decline?

The Wenchuan earthquake recovery so far appears to have achieved many of the aims set in the overall reconstruction plan in terms of building back better, as defined by increased income and material well-being compared to conditions before the earthquake. Thus, "building back better" has been largely achieved, but there is little evidence of the earthquake having set in motion a creative destruction that led to substantial innovation and a new mode of growth. Growth appears to have been achieved through massive use of traditional methods like infrastructure development and construction.

Still, on the international scale, the results are impressive. The very dismal predictions discussed in the introduction, that of natural disasters leading to the no recovery scenario, appear not to have been fulfilled in Sichuan.

The overall results of the surveys in mapping the development of the living conditions of the residents of the earthquake area are reflected in the opinions of the respondents: When asked about their perception of their life now compared to five years ago, 81 percent stated that they were happier at the time of the interview than five years previously, and 87 percent believe that they will be still happier five years in the future.

The optimistic attitude held by the people in Sichuan may also be the reason for a general high level of trust in the government. A very high trust in the central government was recorded in all surveys (97 percent or more reporting that they trusted the government very much or somewhat), while people expressed more skepticism about local and town government. During the first year of reconstruction, the level of trust in low-level government institutions also declined, but had picked up by 2011 and is now at around 80 percent. The high trust probably reflects the fact that the reconstruction of Sichuan was a top-down driven, generally well-organized operation that was well resourced and went surprisingly well.

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Reconstructing a future: Ten years after the Wenchuan earthquake

On May 12, 2008 a magnitude 8 earthquake struck Sichuan province in southwestern China. One of the worst natural disasters in modern Chinese history, it left 87,000 people dead or missing, 370,000 injured and more than 5 million homeless. Roads, villages, schools, homes and lives were lost and destroyed. What is the situation in the earthquake affected areas like today after 10 years of massive reconstruction efforts and rapid development?

Two months after the Wenchuan earthquake, a joint research team of Chinese Academy for Science and Technology for Development (CASTED) and Fafo conducted a rapid needs assessment of the earthquake-stricken areas. The survey was repeated in 2009, 2011 and 2018. Four rounds of large-scale surveys make up a unique source to track the living conditions and reconstruction efforts in the earthquake affected areas. The report "Constructing a Future: Ten years after the Wenchuan Earthquake" gives a glimpse of the overall reconstruction efforts, developments and changes within the area over the decade since the earthquake struck.

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