UNIVERSITY OF OSLO

Earthquake and poverty with Chinese characteristics

Wenchuan earthquake affected communities ten years after the
disaster

Dragana Grulovic

Earthquake and poverty with Chinese characteristics

Wenchuan earthquake affected communities ten years after the disaster

Abstract

In May 2008, China was struck by a massive earthquake that killed closed to 70,000 people. Communities were torn to the ground, and the economic losses were enormous. Ten years have passed since the massive forces took place, and communities and lives have been rebuilt, with some preceding their pre-disaster economic levels. This study applies survey data to estimate the poverty rates in the Wenchuan earthquake affected communities ten years after the disaster. I find that in 2018, the poverty incidence was 3% in the overall area, as compared to 9% before the earthquake. Of the total of 198 sampled communities, 27 reported having no government-designated poor people. However, 23 communities have a poverty prevalence of 10% or higher. These communities have few characteristics in common in terms of demographic structure and access to public services. About half of the communities are located in government-designated poor counties, while the rest are not. Altogether, the poverty situation in the Wenchuan earthquake affected area reflects the complexity of poverty in China. Great challenges remain be solved if the government is to reach the goal of eradicating all poverty within the year 2020.

Acknowledgements

No one accomplishes anything alone. Finishing my master's project was only possible because of the strong support of colleagues, friends and family, who cheered me on, even when I thought all efforts were wasted. Without them, there would be no thesis today.

First and foremost, I want to express my gratitude to my supervisor, Anna Lisa Ahlers. Thank you, Anna, for all the valuable guidance, and for being an inspiration throughout this process.

A very special thanks to all my colleagues at Fafo. Hedda Flatø, Kristin Dalen and Zhang Huafeng, your support has been monumental in finishing this project. Thank you for never shutting the door on me and for lifting the ones of us who feel so small in the world of research.

To my fellow students – we finally did it! And what a ride it has been. Thank you for all the cake days, long conversations, occasional therapy session, and reassuring words that this will all work out in the end. You've made this process so much more fun!

To all my friends and family who picked me up whenever I was down – I am forever thankful for every kind word and gesture. A special thanks to Sumaiya Khan who was my ray of sunshine through all the cloudy days. Summi, I could not have done this without your help. I promise you all my love and support when your turn comes next year!

Dragana Grulovic

Oslo, May 31, 2019

Table of contents

1. Introduction

2008 was a year of great challenges for the Chinese government. As the financial crisis was taking its toll on the global community, the Wenchuan earthquake struck, just three months before the anticipated Olympic games. The enormous forces left over 40 million people affected by the earthquake (Dalen, Flatø, Liu, & Zhang, 2012). Ten years later, the earthquake-stricken area is, in some respect, flourishing (Huafeng Zhang, Christophersen, Dalen, Liu, & Pedersen, 2018). The Wenchuan earthquake struck areas in Sichuan Province were underdeveloped with high levels of poverty, prior to the earthquake (Dunford & Li, 2011). Many more people fell into poverty as a direct cause of the disaster (Dalen et al., 2012; Jia, Chen, Pan, & Zhang, 2018). However, ten years later, the earthquake affected area has a strikingly low level of poverty. In 2018, the disaster hit area in Sichuan had a share of 3% government designated poor households, as opposed to 11% one year after the earthquake (Dalen et al., 2012, p. 160; Huafeng Zhang et al., 2018, p. 77). The strong decline in poverty rates is much due to the post-earthquake reconstruction process, as well as the general poverty alleviation and development in China (Dunford & Li, 2011; Jia et al., 2018).

Years of studies on disasters and poverty have found that natural hazards often bring about more poverty, especially in underdeveloped areas (Shepard et al., 2013). In the case of the Wenchuan earthquake, the national government sought to integrate disaster vulnerability reduction with poverty alleviation and disaster reconstruction (Dunford & Li, 2011). The results are seemingly impressive, considering that the earthquake reconstruction was completed within three years (Huafeng Zhang et al., 2018), and the affected communities show few visible traces of the earthquake today. However, looking at the vast area as a whole, one can easily overlook places in which poverty still prevails. Even with all the tremendous development and reconstruction, there were still certain highly impoverished places with a poverty rate far above the total for the whole disaster-affected area. Despite the overall area showing impressive improvement after the earthquake, one must not ignore the communities who still have large proportions of impoverished individuals and households.

1.1 Research questions

In this thesis, I want to estimate the poverty levels on a smaller scale. Therefore, I have chosen to focus my study on the earthquake affected communities in Sichuan, rather than the area as a whole. My aim is to explore poverty on a community level to see which communities have high levels of poverty in 2018. I want to find out how these high-poverty communities differ from communities with lower prevalence of poverty, to see if they can tell something more broadly about the poverty situation in the earthquake affected area. My thesis will explore the following two research questions:

> *1. What is the prevalence of poverty in communities affected by the Wenchuan earthquake, ten years after the disaster?*
>
> *2. What are the characteristics of communities with high levels of poverty?*

This is a quantitative study based on two surveys conducted by the Fafo Institute for Labor and Social Research (Fafo) and the Chinese Academy of Science and Technology for Development (CASTED). The surveys were conducted in 2011 and 2018 in the Wenchuan earthquake affected communities in Sichuan Province. Sichuan was the province hardest hit by the earthquake and will therefore be the only province I focus my study on. I was not a part of the team who gathered the data, but I was granted access to it by working as research assistant at Fafo during the time I worked on my master's thesis. In this study, I will not be focusing on household level characteristics, but rather explore community related features.

1.2 Why does this matter?

Poverty eradication is high on the global agenda. In fact, eradicating all poverty is at the very top of the United Nations (UN) priorities. In 2015, the UN formulated a set of 17 overarching sustainable development goals (SDGs). The goals serve as a blueprint for how to achieve a better, more sustainable, future for everyone in the world (United Nations, 2019). Eradicating poverty is the very first SDG, which highlights the great importance attributed to this goal. At the same time, the Chinese government has set a goal to eradicate all poverty within the year 2020. The government has followed up on the promise, by leading active poverty alleviation policies and efforts in what they categorize as poverty-stricken areas (C. Shi, 2018). In other words, poverty is a topic of great importance in China, and globally.

2

At the same time, reports on the natural environment of our world show that we are headed toward more disasters and extreme climate in the time to come. The harsh environmental conditions will put a lot of people at risk to suffer damage and loss in the case of events in natures (United Nations Environmental Programme, 2019). China is already one of the countries which is most prone to natural disasters. Historically, about half of all earthquake related deaths have occurred in China (Wisner, Blaikie, Cannon, & Davis, 2004). The country also had the most devastating single event in history, when the 1976 Tangshan earthquake killed between 242,000 and 290,000 people (Han et al., 2016). If we are to prepare for future disasters as to reduce the potential damage, we must understand how natural hazards and human action influences people's and societies' vulnerabilities. Best way to learn is from previous experiences with natural disasters.

1.3 Thesis structure

The thesis is structured as follow. In the second part, I present the theoretical concept of poverty, and the connection between disasters and poverty. In the third part, I look more closely into the details of the Wenchuan earthquake. After presenting the events of the earthquake, I focus on the reconstruction plan, and especially how the disaster was treated as an opportunity to develop the earthquake affected area. I also give a short overview of the general poverty alleviation strategies in China, seeing how the poverty situation in 2018 cannot be understood apart from the general poverty alleviation efforts. The fourth part presents the methodology. The empirical findings are presented in part five. The sixth section discusses the empirical findings, before I conclude my thesis in section seven.

2. Theoretical concepts

This chapter will give an overview of different ways of defining and measuring poverty, to fully understand how the concept is used and what is measured. First, I look at the development of the concept and poverty measurement in general. I then go on to discuss how and why poverty and disasters are connected. The concept of vulnerability in relation to poverty and natural disasters is further elaborated in this part. In the following section, I discuss how the Chinese government defines and measures poverty and implications of different poverty definitions and measurements. Lastly, I discuss how the Wenchuan earthquake relates to the theory.

2.1 The concept of poverty

Over the years, the concept of poverty has evolved a great deal in the academic world, in China as well as in the Western countries (Asian Development Bank, 2012; Guo, 2005; Osmani, 2003). Early definitions of poverty saw it as a *deprivation of possessions or money* (Benabou, Banerjee, & Mookherjee, 2006; Smeeding, 2016). The poverty line as a means of measuring poverty emerged from this monetary definition. A poverty line is set by defining a level of income and/or consumption that is assumed to be adequate for covering the cost of people's *basic needs*, such as food and clothing (Odhiambo, Omiti, & Muthaka, 2014). The individuals or households whose income or consumption falls below that level, are then classified as poor. Poverty lines can be set as relative or absolute (Smeeding, 2016, p. 27). Absolute poverty lines are set by determining a minimum level of income which is sufficient to cover the cost of basic necessities. Within this category falls the poverty line set by the World Bank, which declares that people are poor if their income falls below 1.90 dollars a day in 2011 purchasing power parity (PPP). Relative poverty lines are defined relative to the median or average income in the whole population. One classifies as poor the people or households whose income is at a certain level below the median or average income (Smeeding, 2016, p. 28). It is important to stress that poverty lines are simplified measures of poverty that do not consider regional differences in the cost of living (Alkire & Fang, 2019; Ding, 2014; Harris & White, 2018; Satterthwaite, 2004). They are, however, easier to define and operate with, than other types of poverty measures.

4

Amartya Sen, among others, introduces the concept of *multidimensional poverty*, claiming that poverty is a state of deprivation of rights and capabilities for people to live the life they want (Sen, 1982). By this definition, the focus shifts from purely monetary indicators, to deprivations which constrain people's *capabilities* (Alkire, 2015). Advocates of the multidimensional poverty definitions analyze the political, social, and economic rights of the population, to uncover how these rights differ across peoples and groups within the population. Additionally, multidimensional poverty explores what factors constrain the capabilities of different populations to obtain said rights (Satterthwaite, 2003, 2004; Zhi, Yao, & Cao, 2017). Although there is no definite set of rights, Sen and others suggest applying access to education, health services, sanitation, and food as potential indicators of multidimensional poverty (Alkire, 2015; Sen, 1982). The United Nations Development Program (UNDP) created a multidimensional poverty index (MPI) in 2010. The MPI is released annually and complements traditional poverty assessments by measuring poverty through ten rights-based indicators under the categories of education, health and standard of living (UNDP, 2019; UNDP China, 2016). This illustrates a global shift in the understanding of poverty, from a deprivation of monetary means, to a deprivation of complex rights. In recent years, there is an emerging body of academic research among Chinese scholars which also seeks to measure poverty through non-monetary means. In the Chinese-language literature on multidimensional poverty, there is, among others, knowledge poverty, health poverty, ecological poverty and information poverty (C. Chen, 2017; K. Z. Chen, Zhang, & Hsu, 2016; Ding, 2014; Y. Sun, 2013; W. Wang & Wang, 2016; Zhi et al., 2017).

2.2 Who are the poor?

Causes of poverty are not easily identified, as poverty can be influenced by many factors operating on different levels (Benabou et al., 2006; Guan, 2014). From the point of geography and nature, there is clear link between environmentally fragile, mountainous areas, and high levels of poverty (Shepard et al., 2013). Regions' geographical locations, unfavorable climate and adverse agricultural conditions are closely related to high prevalence of poverty (Guan, 2014; Shepard et al., 2013). On a national level, poverty is often linked to the underdevelopment of some regions within a country, and unequal distribution of wealth and public resources (Guan, 2014, p. 279). On a community level, poverty is often associated with specific groups whose inclination to poverty is high. In these groups, we find women, the elderly, children,

migrants, people with disabilities and ethnic minorities (Chronic Poverty Research Centre, 2009). For example, the elderly, children and the disabled are often poor due to their incapacity to generate income, while also causing higher expenses for their families (i.e. the cost of healthcare or schooling) (Guan, 2014, p. 279). Years of research have showed that poverty is usually higher where these demographics make up a large proportion of the population (Benabou et al., 2006; Chronic Poverty Research Centre, 2009; Glauben, Herzfeld, Rozelle, & Wang, 2012).

2.3 Disasters and poverty

Years of studies on disasters have uncovered the complex relationship between the occurrence of natural hazards and poverty (Fothergill & Peek, 2004; Hallegatte, Vogt-Schilb, Bangalore, & Rozenberg, 2017; Rodríguez, Donner, & Trainor, 2018; Strömberg, 2007). Early studies of disasters treated them as a purely natural phenomenon with only geophysical characteristics. Over the years, scientists and policy makers have begun regarding natural hazards as a complex mix of the disaster itself and human action (Wisner et al., 2004, pp. 5-7). In recent studies of disasters, the impact of natural hazards on human lives is regarded as a result of the natural forces that took place, as well as the social, political, and economic conditions that influence the disaster hit area (Shepard et al., 2013; Wisner et al., 2004, p. 7). A violent tornado poses little threat when it hits a deserted open field, while a weak tornado can wreak havoc when it hits a densely populated area. Consequences might be even greater if the affected area has a population whose socioeconomic and demographic characteristics enhance the degree of damage and loss. The German sociologist, Ulrich Beck, proposed the idea that modern societies are risk societies because hazards in nature and society are seen as the result of human action (Beck, 1992). Some people and communities are more likely to suffer damage and loss in the case of a natural hazard, because man-made political, economic and social factors raise their *vulnerability* to disasters.

2.3.1 The concept of vulnerability

Vulnerability is a term with many definitions that vary across disciplines. In relation to disasters, vulnerability is seen as the chances of humans and communities to suffer damage and

loss when disaster hits (Füssel, 2007; Gaillard, 2010). Wisner et al. define vulnerability as a *set of characteristics of a person or a group, as well as their situation, that influences their capacity to anticipate, cope with, resist and recover from the impact of a natural disaster* (Wisner et al., 2004, p. 11). To put it simply, some people and communities suffer disproportionately when disaster strikes because of external factors influencing their lives and societies (Cao, Xu, Xie, Liu, & Liu, 2016; M. Sun, Chen, Ren, & Chang, 2010; Huafeng Zhang, 2016). One factor closely related to vulnerability to disaster, is poverty (Shepard et al., 2013).

Studies show that poor people and poor communities suffer more damage than their wealthier counterparts when disaster strikes (Fothergill & Peek, 2004; Jia et al., 2018; Rodríguez et al., 2018; Yin, Ma, & Hu, 2017). The reasons are often connected to the settlements of the impoverished population (Shepard et al., 2013). Poor people often find dwellings in places that are especially prone to natural disasters. Their limited funds lead them to settle down in cheaper areas, which are often the most vulnerable to natural disasters. Their houses are often made by materials which are not very resistant to external shocks, such as earthquakes and floods. Wealthier people often have insurance that covers most of the cost or rebuilding homes. In that way, they depend less on personal funds and government transfers. It is to say that the total economic loss tends to be higher in wealthy areas, much due to the cost of property. However, poor people take longer to recover their livelihoods after disasters, as their relative loss is higher. Government subsidies are often not adequate in covering the whole cost of reconstruction, while loans from banks are too expensive. Lastly, there are often more victims in poor areas than in wealthy (Wisner et al., 2004, pp. 12-13). Additionally, natural hazards can put people into poverty because of the losses of livelihood (Cao et al., 2016; Wisner et al., 2004, pp. 112-113).

2.4 The official Chinese poverty definition

The Chinese government has operated with a poverty line since the early days of the People's Republic (National Bureau of Statistics, 2016). In 2010, the government set the so far highest poverty line at 2300 RMB per capita annual income in 2010 PPP. The number is calculated based on the amount of money it requires to cover basic food and non-food related expenses. Calculations are made by combining the cost of consuming 2100 calories a day with the cost of

housing, clothing, cooking expenses, and other expenses in everyday life (National Bureau of Statistics, 2016). In 2015, this poverty line was equal to about 2800 RMB. When calculating income, the government looks at a variety of factors beyond wages and salaries. Among other incomes, there is transfer income (i.e. subsidies such as pensions), asset income, and income from rent of land (National Bureau of Statistics, 2016). What does not appear to be included in this calculation, is money that families receive from family members who are migrant workers. According to the official poverty line, China's poverty rate was 17.2% in 2010, with 230 million people in poverty. By 2017, the poverty rate had fallen to 3.1% and 43 million impoverished people (The World Bank, 2019). The impressive improvements are due to a complex mix of growth in per capita income, the country's general development, and the government's active fight against poverty (Huang, 2016; Khin, 2010; Y. Liu, Liu, & Zhou, 2017; Xie & Xie, 2017).

Poverty measures matter a great deal because different measures categorize different populations as poor, and highlight different causes and solutions to poverty. To put it in practical terms, the measure one chooses decides who becomes eligible for receiving specialized assistance to break out of poverty. One study done in Yunnan applied different poverty measures, both the official Chinese measure as well as other global measures, to the same population, to see who was categorized as poor by which definition. The results showed that there was very little overlap between households who were categorized as poor by the different poverty measures (C. Lu, 2010). This goes to show that applying different measures produces different target populations, which in turn decides who gets what and why. The Chinese poverty line has been met with some criticism, with opponents claiming that it is far too low (Y. Sun, 2013). In 2010, the daily income was set to barely 6 RMB a day. Some mention that the poverty line underestimates the cost of living in general, and especially the cost of non-food related expenses (Y. Liu, Guo, & Zhou, 2018; Ward, 2016).

Defining poverty is politically sensitive, because the set definition determines the level of poverty in a country. The level of poverty can fluctuate solely as a result of applying different measures. Set the poverty line too low, and you can eradicate poverty overnight. When talking about poverty, Xi Jinping stresses that eradicating all poverty is a necessity for building a well-off society (Xinhua, 2017). The large body of literature on levels of poverty in China illustrates how the poverty rate fluctuates according to different measures (Song & Zhao, 2015; Yanhui

8

Wang & Chen, 2017; Zhi et al., 2017). For instance, one study found that China's poverty incidence is overestimated by nearly double as when adjusting the measures to the structure of families (Cao et al., 2016). Other studies find that the poverty incidence is underestimated (C. Zhang, Xu, Zhou, Zhang, & Xie, 2014). Regardless, the official poverty line lays the foundation for Chinese poverty alleviation targeting and efforts.

2.5 The Wenchuan earthquake – in theory and practice

In the case of the Wenchuan earthquake, there is a lot of overlap between earthquake affected areas and government-designated poor areas. Among the 51 severely affected counties, 43 were government-designated poverty counties at the time of the disaster (Dunford & Li, 2011; Jia et al., 2018). Of all the affected villages and townships, 33% were government-designated poor. Some estimates show that in Sichuan, 11% of the affected population (2.1 million) were government-designated poor before the earthquake, and another 3 million fell into poverty as a direct result of the earthquake (Jia et al., 2018; H. Lu, 2010). Fafo and CASTED surveyed affected households in the earthquake struck areas in Sichuan after the disaster. Their findings show that the poverty incidence in the earthquake affected area as a whole was 9% one year prior to the disaster. The number rose to 11% one year after the earthquake (Dalen et al., 2012). Altogether, these studies verify the assumption that natural hazards bring about more poverty immediately after the disaster.

From a theoretical point of view, the Wenchuan earthquake is not special. The disaster struck area is mountainous, with a harsh natural environment and frequent occurrence of natural disasters (Yong Li, Huang, Densmore, Zhou, & Cao, 2009; State Council of the PRC, 2008; Z. Wang & Peng, 2018). The area was rather underdeveloped before the earthquake (Sorace, 2014). A large proportion of China's ethnic minorities lives in these areas, and poverty levels were high relative to the more affluent Eastern parts of the country (Abramson & Qi, 2011; P. Xu, Lu, Xi, & Zhang, 2014). Altogether, poverty levels were expected to be high after the disaster. Yet, ten years later, the poverty levels are strikingly low.

The Wenchuan earthquake makes for an interesting case to explore because the reconstruction plans after the mega disaster sought to alleviate poverty, and reduce the vulnerability of the disaster struck population. Considering how poverty levels are remarkably low ten years after, one can assume that the efforts were successful. I chose to study communities to uncover where the pockets of poverty are ten years after the disaster, and explore what they can tell about the poverty situation in the earthquake stricken area. I will do so by first exploring what was attempted to be done in terms of recovery, before I move on to analyzing the community level characteristics of poor communities. I want to look at the demographic features of these highly impoverished communities, to see if they exhibit larger proportions of demographics associated with poverty. By focusing on communities, I can explore poverty on a more local level and nuance the poverty condition in the Wenchuan earthquake affected area in 2018.

3. The Wenchuan earthquake: disaster and development

This chapter introduces the Wenchuan earthquake and the reconstruction process that followed. First, I will present the economic conditions in the earthquake affected areas before 2008. I then introduce the Chinese government's overall plan for earthquake reconstruction, with special focus on how it sought to integrate development of the region with disaster recovery. Lastly, I look at some of the general poverty alleviation efforts in China. Poverty alleviation efforts are in large part targeted at the rural population in the Western provinces, of which the earthquake affected areas are a part (Z. Chen, 2017). To fully understand the post-earthquake poverty situation in 2018, we need to consider the general efforts to eradicate poverty in China.

Prior to the earthquake in 2008, the disaster hit area in Sichuan was rather underdeveloped. Agriculture accounted for a large proportion of the economy, with some estimates claiming that agriculture related labor made up 70% of the total labor force (P. Xu et al., 2014). Official statistics show that the area was among the poorest in China (Dunford & Li, 2011; Huang, 2014; H. Lu, 2010). In 2007, West China[1] accounted for 57% of the country's total land area, but the GDP of these provinces was only 14% of the country's total (P. Xu et al., 2014). In the most severely affected counties of the three provinces Sichuan, Gansu, and Shaanxi, there was a total of 1056 villages inaccessible by road, 187 with no electricity, and another 3647 without a water supply (Jia et al., 2018). Prior to the earthquake, efforts and policies had been formulated aiming to develop the western regions who were lagging behind the more affluent eastern parts of China by so much as 20 years, according to some estimates (P. Xu et al., 2014). When the earthquake struck, reconstruction was seen by the national government as an opportunity to strengthen the development efforts in the region and catch up the many years of lagging (Abramson & Qi, 2011; Q. Liu, Wang, & Dang, 2018).

---

[1] The Chinese government defines West China as six provinces, Gansu, Guizhou, Qinghai, Shaanxi, Sichuan, and Yunnan; one municipality: Chongqing; and six autonomous regions: Ningxia, Tibet, Guangxi, Inner Mongolia, Xinjiang, and parts of Hunan and Hebei. (Source: P. Xu et al., 2014)

3.1 The events of the earthquake

On May 12, 2008, an earthquake of magnitude 8.0 on the Richter scale hit the western provinces of Sichuan, Shaanxi, and Gansu, with Sichuan suffering the most damage and loss (State Council of the PRC, 2008). The massive natural forces of the earthquake are the worst in terms of magnitude since the founding of the People's Republic of China in 1949 (Dunford & Li, 2011). The epicenter was beneath the town of Yingxiu in Wenchuan county, Sichuan (Huafeng Zhang et al., 2018). The earthquake struck along the Longmenshan mountains, at the eastern part of the Tibetan Plateau, and stretched for 500,000 square kilometers (Yong & Booth, 2011). Buildings in Shanghai swayed as a result of the shake, and tremors were felt as far as to neighboring countries and Beijing (K. Z. Chen et al., 2016, p. 12). The mountainous area experienced over 33,000 aftershocks up to several months after the main tremor, with some aftershocks measuring as high as 6.0 on the Richter scale (Y. Chen, Yang, Zhang, & Liu, 2013; Yong Li et al., 2009). Additionally, the earthquake caused the largest number of geohazards recorded in human history (Fan et al., 2018). Quake lakes, rock avalanches, and mudslides took their toll on the already fragile area. Over 200,000 landsides were triggered by the massive earthquake, of which the Dagungbao landslide ($\sim$1 km^3) was one of the largest earthquake-induced slides ever recorded (Fan et al., 2018; C. Xu, Dai, & Xu, 2010).

Consequently, the loss of life was enormous. The Chinese government reports that 69,226 people died, in addition to 18,923 missing and 374,643 injured (State Council of the PRC, 2008). An estimate of 6,525,000 housing units were destroyed, with another 23,143,000 damaged (State Council of the PRC, 2008; Huafeng Zhang et al., 2018, p. 25). The earthquake took place at 14:28 local time when most children were at school. Most deaths in the case of earthquakes happen due to buildings collapsing (Wisner et al., 2004, p. 277). In this case, 7,444 schools were damaged and over 5,000 schoolchildren lost their lives (Yong & Booth, 2011). Ultimately, the disaster affected over 46 million people, with social impacts ranging from loss of livelihoods and homelessness, to trauma-related psychological disorders, such as post-traumatic stress disorder (K. Z. Chen et al., 2016; F. Wang, Guo, Hu, & Liu, 2008). The massive forces caused the damaging or blocking of many roads, while telecommunications, water, electricity, and gas were disrupted. Public institutions, such as schools and hospitals, were damaged or torn to the ground, along with businesses and public facilities (Yong & Booth, 2011). Some communities, like Wenchuan and Beichuan, were completely demolished (K. Z.

Chen et al., 2016). The latter was left untouched and serves as a memorial sight for the earthquake. The Chinese government estimates that the direct economic loss due to the earthquake was 845 billion RMB (State Council of the PRC, 2008).

The Chinese government was swift in earthquake response, despite facing enormous challenges in providing emergency disaster relief (You, Cheng, & Yao, 2009). As some roads and important infrastructures were completely ruined, certain places and people became nearly impossible to reach in the aftermath of the disaster. When previous disasters struck in China, the local governments would take the leading role in disaster mitigation (P. Shi, 2016; Sim & Jun, 2018). However, the scope of the Wenchuan earthquake required coordination between large bodies of government. The central government took the leading role in disaster mitigation, and soon, all branches of government were rapidly mobilized (Huafeng Zhang et al., 2018, p. 32). In the first stage of disaster management, focus was on securing food, water, medical care, and shelter for the victims. In the following stage, assistance shifted from distribution of food to distribution of living allowances (Huafeng Zhang et al., 2018, p. 32). Lastly, the reconstruction period sought to rebuild the area beyond its pre-disaster standard (P. Xu et al., 2014). Fascinatingly, the public response to the Wenchuan earthquake sparked a debate in China on the emergence of a civil society (Teets, 2009; B. Xu, 2014). Particularly striking was the Chinese government allowing non-governmental organizations (NGOs) and international organizations, such as the UNDP, to take part in the recovery process (Q. Liu et al., 2018; B. Xu, 2014). The NGO involvement was unprecedented in China (Huafeng Zhang et al., 2018, p. 35).

3.2 The overall plan for post-earthquake reconstruction

On September 19, 2008, the Chinese government issued the State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction (the overall plan, hereafter). The plan served as a set of guiding principles and instructions for disaster recovery in the earthquake affected area. Six clearly defined goals were set to be achieved within three years. The goals were:

(1) Ensure that every family has housing.

(2) Ensure that at least one person in each family has a job with annual income exceeding the pre-disaster level.

(3) Provide basic social welfare to the disaster affected people.

(4) Restore and build public facilities and infrastructures.

(5) Develop the economy of the earthquake affected area.

(6) Improve the ecological environment with disaster mitigation and preparedness capacity.

The plan paid particular attention to the economic development of the area by encouraging reconstruction to follow the "Development of the West" policies initiated in 1999, as well as other existing strategies and principles for development of the West (State Council of the PRC, 2008). The strong focus on development, continued economic growth, and market reform is emphasized throughout the document.

In accordance to the "people first" principle, priority was given to providing shelter and reconstruction of homes, as well as infrastructure and public facilities (P. Xu et al., 2014). The plan was oriented toward building and expanding infrastructure as a means of achieving the goals of development (Sorace, 2015). Interestingly, the overall plan had a strong focus on sustainable development by emphasizing environmental consideration in the reconstruction process, while also promoting new industries which are in line with the government's vision of a sustainable future (Fan et al., 2018). New villages were to be constructed to lift the villages' economic levels beyond pre-disaster conditions. Reconstruction was to follow the existing plans for coordinated urban and rural development through industrialization and urbanization (Dalen et al., 2012, p. 20; Sorace, 2015). Furthermore, the overall plan stated that the reconstruction of communities should aim at long-term development that enhances the capacity of people and communities to be self-reliant and self-sufficient in the long run, and not depend on government transfers (State Council of the PRC, 2008).

Elements of vulnerability reduction can be found in the reconstruction efforts and the overall plan. In the early stages of disaster mitigation, affected households were given living allowances and subsidies to rebuild housing (Feng, Lu, Nolen, & Wang, 2016; M. Sun, Chen, Ding, & Shi, 2010; Huafeng Zhang, 2016). The overall plan clearly states that infrastructure

14

and new buildings were to be constructed under higher safety standards, as to be more resilient to outside shocks (State Council of the PRC, 2008). As most people were involved in agricultural work before the earthquake, guiding principles in the overall plan encouraged rural families to diversify their income and rely less on income from agriculture. The agricultural sector is vulnerable to events in nature. By turning people away from agricultural work, one reduces their vulnerability to future disasters. Reconstruction plans were aimed at increasing agricultural production by making more efficient use of cultivable land and industrializing and specializing the agricultural sector (M. Sun, Chen, Ren, et al., 2010). Urbanization efforts included encouraging rural households to find non-farm employment through relocation and migration (Abramson & Qi, 2011). Other concrete measures were to strengthen communities' disaster preparedness (State Council of the PRC, 2008).

The reconstruction of the Wenchuan earthquake affected area was costly. One mechanism for achieving the reconstruction goals and relieving some of the central government's financial burden, was to activate China's paired-assistance scheme. The system dates back to the 1970's (Zhong, 2013; Zhong & Lu, 2015). Under this program, every severely affected earthquake struck county was paired with an economically developed, unaffected province or city, on a one-to-one basis. Altogether, 19 provinces were paired with the disaster struck counties.[2] The donors were to give 1% of their annual revenue over a period of three years to their earthquake affected counterparts (State Council of the PRC, 2008). Donor provinces assisted in all areas of reconstruction, including planning, designing, and building of homes, infrastructure, and public services (Dunford & Li, 2011; Haibo Zhang & Tao, 2018). The donor provinces were also encouraged to invest in their disaster struck counterparts by moving industries to these areas and employing local residents (Ying Wang & Dong, 2010). In practice, donor provinces became responsible for all stages of post-earthquake reconstruction. Thus, the earthquake affected areas were rebuilt under various reconstruction plans and budgets.

3.2.1 Integration of poverty alleviation with disaster recovery

Poverty alleviation efforts were written into the overall plan, and special attention was to be paid to vulnerable groups, such as ethnic minorities and the impoverished population (State

---

[2] See table 1 in Appendix A for an overview of the partner support arrangements.

Council of the PRC, 2008). The overall plan sought to blend risk and vulnerability reduction with poverty alleviation and general disaster mitigation (Dunford & Li, 2011). The goal of poverty alleviation was set out to be achieved through the means of overall development of the affected communities (Sorace, 2014). Firstly, the overall plan explicitly stressed that the government was to provide social security to vulnerable groups and areas (State Council of the PRC, 2008). Furthermore, a special plan was made by the Chinese poverty alleviation office to target poverty-stricken villages that needed reconstruction (Huang, 2014). Preferential treatment was to be given to poverty-stricken areas, especially villages, by allocating sums which were to be used for developing the villages and get people out of poverty. Preferential loans were to be given to impoverished people to rebuild their homes and livelihoods (Dunford & Li, 2011). Companies were also granted benefits for hiring government-designated poor people (K. Z. Chen et al., 2016).

Treating disaster as a development opportunity has been met with positive as well as negative response. Advocates of the system highlight how it brings about economic and social change that lifts an area, and the people living in it, beyond the pre-disaster levels (Zhong & Lu, 2018). In the case of the Wenchuan earthquake, some of the affected places had very low levels of economic development prior to the earthquake. Getting them back to their pre-disaster levels would not be much of an achievement, and the overall area might still lag very much behind the more affluent parts of China. Opponents of the system often criticize the view that development alone can eradicate poverty. Some claim that poverty reduction cannot only be understood as economic development, and that the problems of poverty stretch beyond rapid economic development of an area (Sorace, 2015). If one does not address the root causes of poverty, it will prevail even when masked under development projects (Abramson & Qi, 2011). Several studies have assessed the pairwise-assistance scheme (Ying Wang & Dong, 2010; Haibo Zhang & Tao, 2018; Zhong, 2013). What I am able so summarize from these studies is that there are big differences in what developmental projects were implemented in the communities, especially since budgets vary between donor provinces. Since the overall plan was just a guiding document, there were not many specific measures mentioned to alleviate poverty. Donor provinces had to find their own way to promote development and poverty alleviation (Sorace, 2014, 2017).

3.3 Poverty alleviation in China

To fully understand the poverty situation in the earthquake affected area in 2018, we must look at the broader poverty alleviation efforts in China. The earthquake affected area has gone through ten years of development, both as a direct cause of the earthquake, but also as part of the general development in the country. Due to the scope of this thesis, I will not present all the developmental plans in this region. Since I focus on poverty, I will explore some of the poverty alleviation efforts that have been aimed at this area. I will mostly focus on poverty alleviation efforts that aim to solve rural poverty. That is because the central government mainly sees poverty as a rural problem.

What characterizes the Chinese poverty alleviation strategy is its place targeted and development-oriented nature. China's poverty alleviation efforts have gradually transformed from insuring basic needs (food and clothing), to ensuring comprehensive rights. Prior to the reform and opening-up in 1978, most of China's rural population was characterized as poor (Y. Liu et al., 2018). Typical means for alleviation of severe poverty were financial subsidies. Since economic development started transforming the country, poverty alleviation efforts followed. China established institutions for anti-poverty work at the national, provincial, prefectural, and county level. Meanwhile, the country began designating poor counties and allocating special funds to develop these areas (Yuheng Li, Su, & Liu, 2016; M. Liu, Wang, Tao, & Murphy, 2009). A county was government-designated poor if 2% or more (3% for counties in the West) of its total population was government-designated poor (Y. Liu et al., 2017; Park, Wang, & Wu, 2002). Close to 600 counties became marked as government-designated poor and became eligible for special poverty alleviation funds (Park et al., 2002). The list is frequently revised, but no counties were removed from the list until 2017 (Lau, 2017).

In 2001, China laid out a plan to shift poverty alleviation focus from the county level to village level. In addition to the government-designated poor counties, 148 thousand villages became labeled as government-designated poor villages (Yanhui Wang & Chen, 2017). The designation is based on the living conditions and poverty levels in each village. Anti-poverty work focused on overall development of impoverished villages (Park & Wang, 2010). Simultaneously, China rolled out the plans to build a new countryside to promote the development and economy of the

rural areas, under the guiding principles of urbanization and industrialization. In 2006, the ancient agricultural tax was put to an end. Under the Hu-Wen administration, China also saw a rise in social security schemes (Duckett, 2012). Healthcare schemes were rolled out together with basic minimum living security systems and old age pensions, and these have since been expanding (X. Li, Fan, & Leng, 2018; Solinger & Hu, 2012; Zhu & Walker, 2018). In 2009, the nine-year compulsory education became free for all citizens, alleviating part of the financial burden of rural and urban families (Q. Zhang & Shi, 2017).

Since Xi Jinping came to power, Chinese poverty alleviation strategies have been even more development oriented and focused on targeting. In official government speech, eradicating poverty is imperative for building a well-off society (C. Shi, 2018). Specific measures were formulated to help China win the fight against poverty. These comprise of six accurate measures (六个精准), five batches (五个一批), ten poverty alleviation projects（十个扶贫项目）and six actions (六项行动) (Y. Liu et al., 2018). The *six measures* include efforts to ensure accurate and effective targeting and proper use of alleviation funds, such as accurate identification of the poor, accurate use of funds, and accurate implementation of policies. The *five batches* include relocation of the poor away from remote areas, helping the work abled raise income, strengthen education to prevent intergenerational poverty, and enhance social security for vulnerable groups outside the workforce. The *ten poverty alleviation projects* seek to develop particular industries in poverty-stricken areas, such as tourism and e-commerce. Lastly, the *six actions* seek to determinate poverty by enhancing social security and access to education, and promoting cooperation between impoverished villages and central enterprises (Yan, 2016; Zuo, 2019).

Under Xi's leadership, targeting poor individuals and households became a pillar in poverty alleviation efforts (Ji, 2017). The notion was put forward in 2013 and consists of the implementation of specific measures to help individuals and households get out of poverty, rather than just focusing on county and village level investments (Yuheng Li et al., 2016). The result became an official registration system for poor households and individuals. This registration system provides the data which serves as the foundation for mapping highly impoverished areas in China (Y. Liu et al., 2017). Decades of economic growth and poverty alleviation efforts have drastically reduced the number of poor people in China. According to

measures by the World Bank, the number of impoverished people was 750 million in 1990, making the poverty headcount ratio 66%. In 2017, the number of poor people has fallen to 30.5 million, and the headcount ratio was 3.1% (The World Bank, 2019). Urban poverty is to a large degree eradicated (Y. Liu et al., 2017). However, in 2011, China identified 14 contiguous poor areas with particular difficulties (CPAPD) (Y. Liu et al., 2017). The Tibetan ethnic areas in Sichuan, Yunnan, Gansu and Qinghai make up one such area that still suffers from high poverty rates. China's rural poor are located in mountainous and hilly environments. Most of the key impoverished counties suffer from frequent natural disasters and have fragile environments and an agglomeration of ethnic minorities (Han et al., 2016; Y. Liu et al., 2017). According to statistics, the probability of suffering a major natural disaster is five times higher in the government-designated poor counties, than in other areas (Yan, 2016, p. 2).

4. Data and methodology

In this chapter, I present the data used in my thesis, and discuss the methodology that guided my study. This quantitative study is based on an analysis of community surveys conducted in the earthquake affected area in Sichuan, in both 2011 and 2018. Firstly, this chapter will provide closer information about the datasets, such as the sampling. Secondly, I go on to discussing the research design and methodology applied in my particular study. Lastly, I look into some of the limitations to my choice of methodology.

4.1 Datasets

In the aftermath of the devastating earthquake, the Chinese government entrusted CASTED to conduct a survey in the worst hit province, Sichuan. The aim of the survey was to map people's rapid needs, survey how people cope with the earthquake, and what people need in terms of recovery. The project was conducted in cooperation with Fafo, and partly financed by the Norwegian Ministry of Foreign Affairs. Results from this survey were used by the Chinese government in constructing a plan for recovery and reconstruction of the earthquake affected area. Three more surveys were commissioned, one in 2009, one in 2011 and the last in 2018. These surveys aim to provide insight into the recovery process for the affected communities and households (Dalen et al., 2012; Huafeng Zhang et al., 2018). Altogether, these surveys provide unique insights into the development of the earthquake affected area and the lives of the people living in it.

Each survey consists of three parts; a community survey, a household survey, and an individual survey. In this thesis, I solely use the community surveys from 2011 and 2018 because the same communities were surveyed in these two years, while different communities were surveyed in 2008 and 2009. The enormous forces of the earthquake left some areas inaccessible in the aftermath of the earthquake. Among these were some seriously affected areas that became reachable only after roads were dug out or rebuilt. The unreachable communities were included in the later surveys. That explains why I only look at the two latest years. The community datasets of 2011 and 2018 cover 30 earthquake affected counties, divided into 11 very seriously affected and 19 seriously affected. The classification is based on what the Chinese government

was able to learn about the degree of damage in the communities, rather than following a strict scientific criterion. In practical terms, most of the "very seriously" affected counties were on the verge of near-complete devastation (Dalen et al., 2012, p. 17). There is a total of 198 communities in each dataset. Community refers to both urban neighborhood communities (n=55) and rural villages and townships (n=143). Communities were sampled through probability proportional to size sampling, as the first stage in sampling households. The surveys were conducted by a team of interviewers from CASTED through structured interviews with a community leader, such as cadres and village heads. Again, I was not a part of the team, but I was granted access to the data through my position as a research assistant at Fafo.

4.2 Methodology

In this thesis, I draw results from the Survey on the reconstruction of areas affected by the Wenchuan earthquake. I gather information by calculating proportions and following trends in variables from 2011 to 2018. Survey methodology is beneficial because it can provide information about many cases at one time. Gathering data of such great scope requires large scale financing, specialized competence and human resources, none of which are available to me at this point. By relying on data gathered by two research institutions, I am sure to base my study on quality data that has been verified by other researchers. All calculations were performed in Microsoft Office Excel 2016.

4.2.1 Measuring poverty incidence

To explore the first research question, I will estimate the poverty incidence in each community in 2018. I choose to measure poverty as the poverty head count ratio, meaning calculating the proportion of the population, both individuals and households, which is below the poverty line. For operationalization of poverty, I identify three relevant variables in the 2018 questionnaire. Community leaders are asked if they have government-designated poor people in their community. If the answer is yes, they are asked how many government-designated poor individuals there are, and how many government-designated poor households. Additionally, the community leaders were asked to provide information on how many individuals and households of permanent residents there are in their communities. I use the numbers of total population and

government-designated poor population to calculate the relative poverty incidence of both households and individuals in each community. I base the poverty measurement solely on the number of government-designated poor people and households, and I will not apply any other indicator of poverty. Limitations of my methodological choices will be discussed under "Limitations".

One of the disadvantages of not collecting your own data is that you cannot control what variables are in the datasets. I my case, the 2011 survey does not have any variables on poverty. The community leaders were not asked if there were government-designated poor people or households, as the government had not yet begun the system of registration. That implicates that I am not able to calculate poverty incidence in 2011, and not able to compare it with 2018. It would have been preferable to have that option, because then I could track differences in poverty incidence in these two years. However, it is not imperative for the study because I focus on where poverty is prevalent in 2018. I will use the data from 2018 to categorize communities on the basis of poverty in that year, and I will use the survey of 2011 to look at the development in chosen characteristics of the communities that had high poverty incidence in 2018. After calculating the poverty incidence in all communities, I pick the communities in which the government-designated poor households or individuals make up 10% or more of the total population. I set the cutoff at 10% because this is remarkably higher than the average share of poverty in the communities. The communities with a poverty prevalence of 10% or more are the cases used in my exploration of research question two, which is to find the characteristics of these high-poverty communities.

4.2.2 Chosen characteristics of high-poverty communities

When deciding on what characteristics to focus on for the high-poverty communities, I tried to find characteristics that combine earthquake reconstruction and general poverty alleviation efforts, with the theory on poverty. I first turned to theory to see what could be expected to find as characteristic of poor areas. The first thing that comes up is *geographical location and frequent natural disasters*. All Wenchuan earthquake affected communities are in mountainous areas which are prone to natural disaster. It is practically a prerequisite for my selected cases, and therefore, I will not be looking more closely into geographical features of the communities.

It is not to say that there are not geographical differences in these areas, but they are set off by their overwhelming similarities. Therefore, more specific geographical location will not be addressed.

Secondly, the theory brings up *demographic features* when describing areas in which poverty prevails. High-poverty areas are often characterized as being areas in which the share of the elderly population is larger than average, as well as the share of ethnic minorities. Characteristic for China is that the working population leaves their communities in search for jobs in bigger cities. Consequently, children under the age of 18 are left behind, along with the elderly. I want to combine the demographic features and migration rates to see if the poorer communities have a large proportion of people outside the workforce, and see if there is a relation between migration and the demographic structure of the remaining population in the communities. I address the proportion of elderly and children as unfavorable demographics because they are outside the workforce, which in turn limits their ability to generate income. Lastly, I look at the proportion of ethnic minorities, because of the connection between high minority areas and poverty areas.

My datasets offer information about the total number of people over 60, the total number of people under 18, the total number of members of ethnic minorities, and the total number of people who have migrated out of the community. As for outmigration, the variable refers to people who are otherwise registered in the community, but who do not have permanent residence anymore. I use these numbers to calculate the proportions of these demographics in each community, to see if there are higher proportions in the poorer areas than in the less poor communities. The average share of the same demographics in lower-poverty communities serve as the reference point to compare the proportions in higher-poverty communities. I compare the numbers in 2018 with those of 2011 to see what changes in demographic structures have happened between those two years. On the basis of theory, my assumption is that the highly impoverished communities have a larger share of demographics associated with poverty.

Furthermore, I want to see what kind of *public services* these communities have access to. There was a strong emphasis on public services and facilities in the reconstruction process and general

poverty alleviation efforts on the side of the government. I want to see if there has been any change in what public services these communities have access to. My data offers insight into whether or not the communities have certain public services. It is worth noting that I have no means of testing how *good* or *accessible* these services are. I just have information on whether they existed in 2018. I want to see which public services the communities had in 2018, and which they had in 2011. My data ask the community leaders to report on the following facilities and services in their communities:

- Primary school
- Middle school
- Medical health station
- Bank
- Post office
- Garbage disposal station
- Sewage system

The 2011 survey asks if the communities had schools and medical health stations before the earthquake as well. In that way, I can trace which community has what service, and if there are changes since the earthquake. My assumption is that the high-poverty communities have few, if any, of the above-mentioned services, and certainly fewer than the low-poverty communities.

Lastly, I chose a characteristic based on the Chinese poverty alleviation system. As mentioned in the previous chapters, China began designating poor counties, villages and people. As a result, certain places have been granted developmental opportunities because of them being *labelled as poor*. I find it interesting to see if the high-poverty communities are in government-designated poor counties. I crosscheck the official list of poor counties with my cases (the high-poverty communities) to see if there is overlap. Additionally, my datasets ask the community leaders to state if their community has had any specialized project initiated by the government, private enterprises, or other institutions, to develop the local economy since the earthquake. The 2011 questionnaire also provides information on whether the communities were in a mutual responsibility program at the time of the survey. I am not able to say what program was initiated or any consequences thereof. I also cannot say whether the poverty incidence in the communities was the reason for nor the consequence of the specialized programs. Instead, I simply want to see if any effort has been made since the earthquake to boost the economy in

these places. In a way, it becomes a test of the targeting system for Chinese poverty alleviation. Since there is such a big focus on targeting, questions regarding the precision of the system can be raised if some of the communities fall within the targeting, and others fall out. Based on the introduced theoretical approaches and general poverty alleviation system, figure 1 presents the assumptions of community characteristics in the communities with a poverty incidence of 10% or more.

Figure 1: Presumptions of the characteristics of high-poverty communities
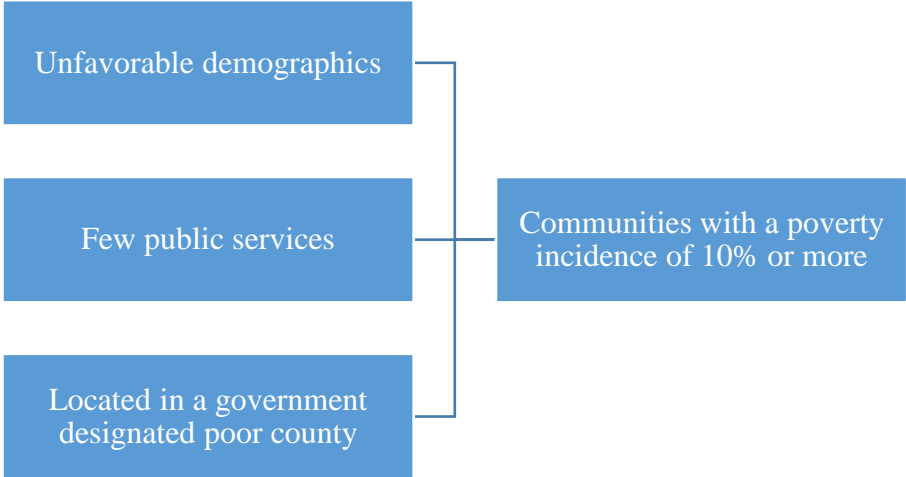
4.3 Limitations to my choice of methodology

Surveys cover a large population, and can therefore say something about the tendencies within a large group of cases. They are good for reporting answers to the questions of *what* and *how many* (Bryman, 2016). Two big questions that are complex to answer by using survey data are *how* and *why*. Causality is often difficult to prove by merely looking at numbers (Johnston, 2008), and not possible by my data alone. In the case of this thesis, I cannot say that the changes in poverty between communities is due to the earthquake, to different reconstruction strategies, or due to poverty alleviation strategies. In other words, I cannot explore why some of the sampled communities have a higher poverty incidence than others. My data can only say how these communities looked in 2011 and 2018 on the chosen variables, and how this differs across communities with varying prevalence of poverty. Questions about causality mechanisms and processes would have to be answered by doing other types of studies within these communities,

and often, qualitative studies are better equipped to answer these questions (Leavy & Phillips, 2014; Odhiambo et al., 2014).

Another important uncertainty of my methodology is related to the reliability of the data. The Chinese government has been known to manipulate official statistics and tweak numbers in their favor. In this thesis, the interviewees might have answered falsely on the questions of poverty, which would make my analysis wrong. In recent years since China began designating poor people and places, debates have arisen regarding peoples' unwillingness to remove the poverty label despite not being poor according to official criteria (C. Shi, 2018). I do not know how widespread this problem is. For my thesis, it could mean that some of the community leaders reported too high numbers of poor people, while others reported too low numbers. In any case, I cannot test the actual numbers of impoverished people. However, I do not have a strong suspicion to assume that these numbers are remarkably manipulated since the surveys were conducted by two well-known research institutes.

Lastly, I have somewhat simplified the poverty situation by applying a measure that is purely based on the government's definition of poor people, because I have no means of checking which individuals or households are poor and why. Another important limitation to this study, is in relation to the poverty measurement which I have chosen. I base my research on the poverty head count ratio, which comes with important limitations. The poverty head count ratio only categorizes people in a proportion above or below a certain income, but it does not say anything more substantial about the poverty incidence in the communities. I have not looked at why some people are poor, and how these reasons differ across communities. I have also not taken into account whether the poverty of these individuals or households is permanent or transitory. I have not measured the poverty depth, meaning how far people are below the poverty line in each community. In general, these questions are hard to answer by my data alone. However, I am confident that even this limited data can provide useful information about the poverty situation in the Wenchuan earthquake affected communities.

5. Findings

In this chapter I will present the empirical findings from the survey. The first part starts by describing the poverty incidence in all the sampled communities and commenting the key findings. The second part looks more closely on the communities with a *poverty prevalence of 10% or more*. First, I describe the demographic features by looking at the proportion of elderly and children, as well as outmigration and the share of ethnic minorities. Second, I look at what public services are offered in these communities. Lastly, I look at whether the community is located in a government-designated poor county and if they have had any specialized programs. This way, I widely analyze the poverty situation in high-poverty communities.

5.1 Poverty incidence in all sampled communities

Figure 2: Poverty head count ratio in all sampled communities
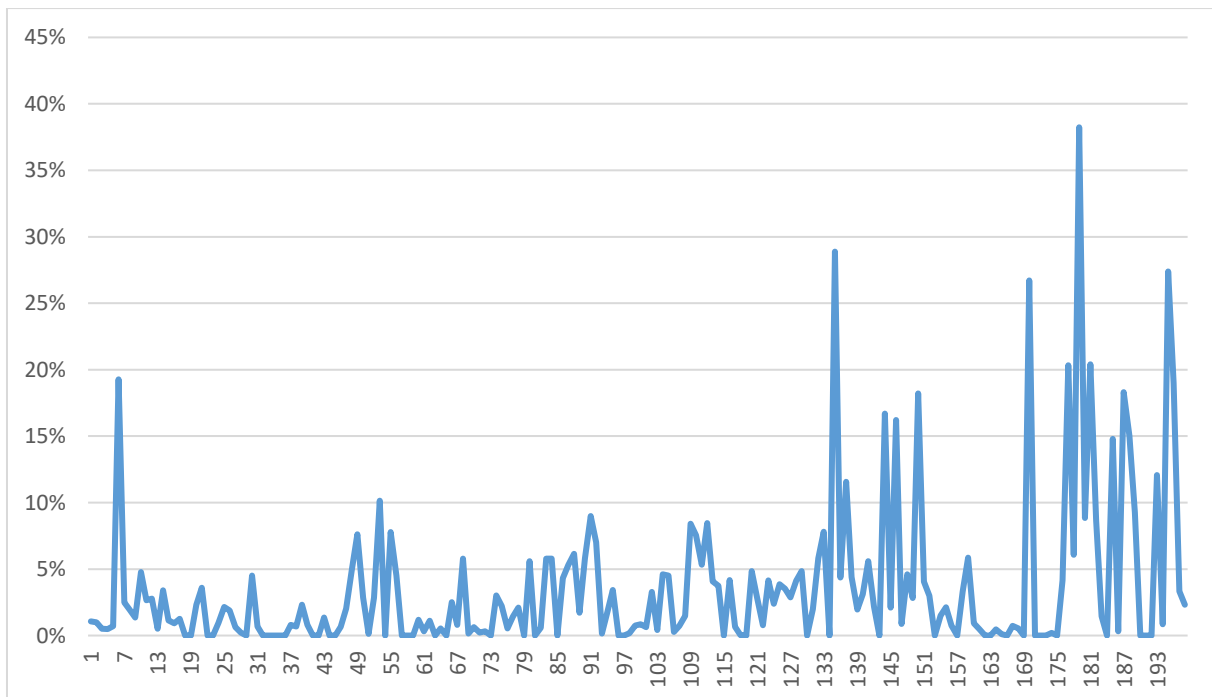
My data shows that out of the total population in the communities, 3% of households and 2% of individuals were government-designated poor in the earthquake affected area in 2018. Official statistics from Sichuan show that in 2017, 2.8% of the population in the province were

government-designated poor (National Bureau of Statistics, 2018). Thus, the Wenchuan earthquake affected area has a smaller proportion of officially registered poor people than the province as a whole. I was able to calculate the poverty incidence in only 195 out of the 198 sampled communities due to missing values on key variables. Out of the 195 valid cases, a total of 28 communities reported having no government-designated poor people, with an additional 17 reported having below 1% poverty in their communities. Altogether, 96 communities have a poverty prevalence below 2.8%, thus lower than the province total. Out of all sampled communities, 76 have between 3% and 9% poverty, which adds to a total of 172 communities with a poverty prevalence below 10%. That leaves 23 communities with 10% government-designated poor people or households. At the very top of the graph are four communities, with a poverty prevalence of 27%, 29%, and the highest, 38%.

Table 1: Poverty in rural and urban communities

| | | Are there government registered poor households in the village/ neighborhood community? | | |
		Yes	No	Total
Area	Village	132	13	145
	Community	38	15	53
Total		170	28	198

I find it particularly interesting to look at the disparities between urban and rural communities. The survey shows that 38 out of the 170 communities who reported having government-designated poor households were urban communities, and the remaining 132 were rural. Only 15 urban and 13 rural communities reported having no government-designated poor people. My data shows that there is an average of 1% poor individuals and 2% poor households in the urban communities. As a contrast, there is on average 7% poor households and poor individuals in the rural communities. As expected, the average poverty incidence is higher in the rural communities. However, based on the survey, the highest total number of poor individuals, 519, was in an urban community in Santai County.

Table 2: Degree of disaster in communities and government-designated poor households

		Are there government-designated poor households in the village/ neighborhood community?		
		Yes	No	Total
Degree of disaster	Seriously affected area	77	13	90
	Very seriously affected area	93	15	108
Total		170	28	198

The poverty incidence in these communities highlight some interesting aspects of the poverty situation in the Wenchuan earthquake affected areas in Sichuan. Even after being an underdeveloped area that faced a tremendous shock, 15 out of 108 very seriously affected communities had no government-designated poor people ten years after the disaster. In fact, 14% of the sampled communities had no government-designated poor people or households.

Figure 3: Poverty incidence in all communities – arranged in ascending order according to poverty headcount ratio
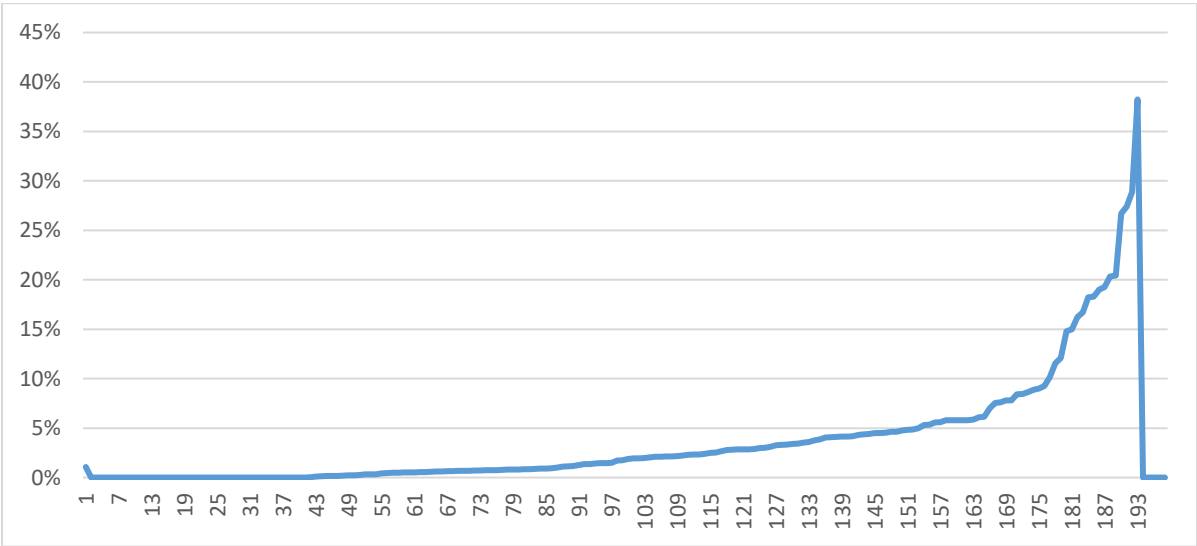
To illustrate why I chose to set the cutoff at 10% poverty for the remaining part of the analysis, I arranged the communities in ascending order according to poverty incidence (Figure 3). The graph rises sharply at the tail end, as the poverty incidences increase remarkably. I found it

interesting that these communities show figures which are noticeably higher than the rest, which caused me to wonder how, and if, they differ from the other communities. There are 23 communities with a poverty prevalence of 10% or more poor individuals or households. Among them, one is an urban neighborhood community while the rest are rural. The urban community is located in Dujiangyan City. In the community, 19% of the individuals and 27% of the households were government-designated poor at the time of the survey. The total population in this community was 1035, and there were 689 households of permanent residence. Although this is an interesting case to investigate in more detail, I have chosen to not take it further in the analysis. As I have limited space, I will focus the rest of this thesis on rural communities alone, as they are the ones being targeted by poverty alleviation efforts and are distinct administrative entities.

The remaining 22 communities are presented in more detail in figures 4 and 5. Hereafter, the 22 communities with a poverty prevalence of 10% or more will be addressed as high-poverty communities, while the remaining will be referred to as low-poverty communities. On average, high-poverty communities have 17% poor individuals and 18% poor households. In other words, the average poverty incidence of households is six times higher in the high-poverty communities than in low-poverty communities. If the 22 are removed from the list of rural communities, the average poverty incidence in rural communities falls from 7% to 4%. The communities are spread across 13 counties and administrative regions. The counties with most communities on the list are Zhongjiang County, Qingchuan County, and Jiange County, with three communities each. Of the 22, 13 were *seriously affected*, and 9 were *very seriously affected* by the earthquake. The high-poverty "very seriously" affected communities were in paired assistance programs after the earthquake. Their partners were Shandong, Jiangsu, Zhejiang, Henan, Hebei, Shanxi, Anhui and Heilongjiang Province. The remaining communities were not in mutual aid partnerships. A total of 24,777 people lived in these communities in 2018. The smallest community had 170 permanent residents, while the largest had 4,567.

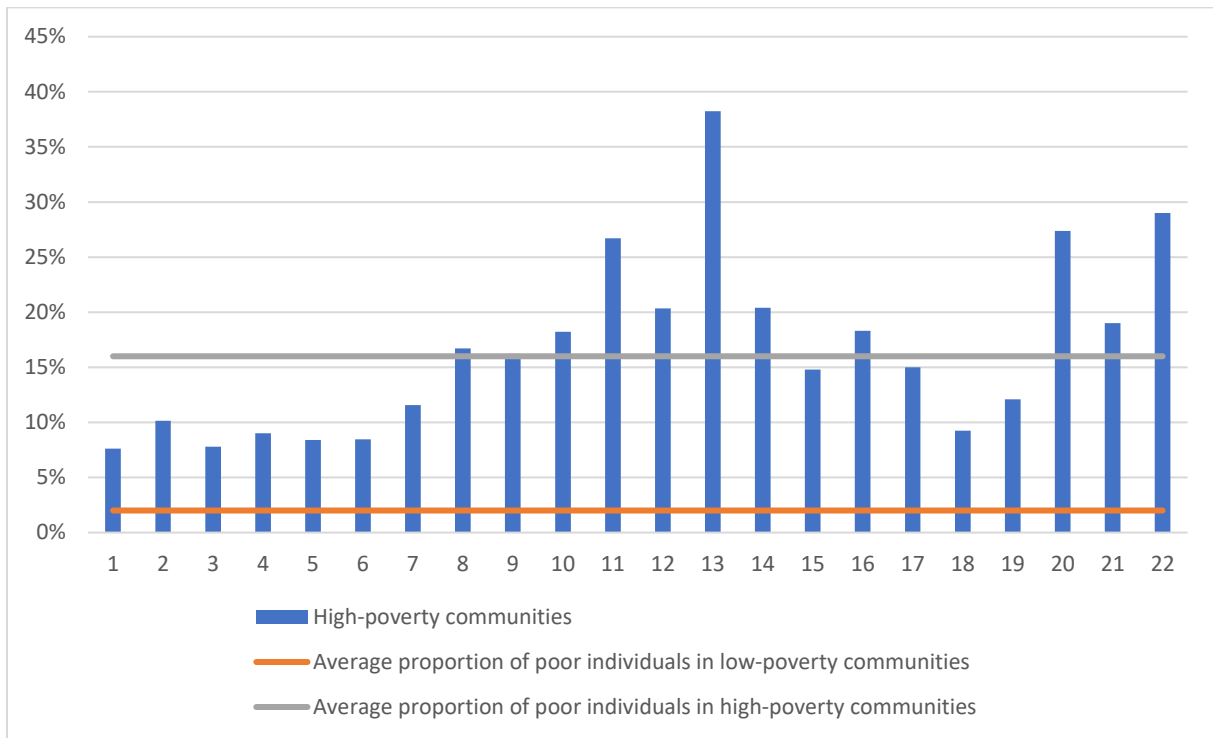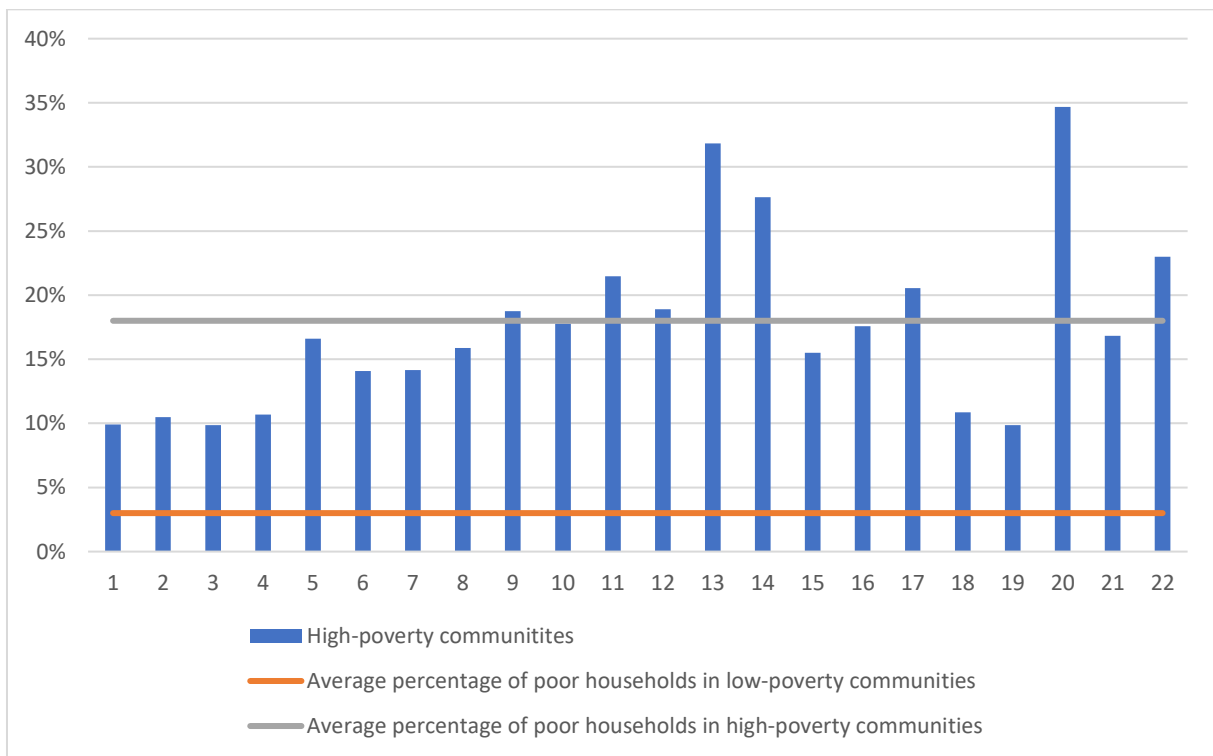*Figure 4: Proportion of poor individuals in high-poverty communities*

*Figure 5: Proportion of poor households in high-poverty communities*

5.2 Characteristics of high-poverty communities

The remaining part of this section focuses on the characteristics of the 22 high-poverty communities. I discuss the empirical findings pertaining to the characteristics of demographics, public services and location in a government-designated poor county. As some background information, in June 2011, 14 out of 19 community leaders claimed that the economy in their communities had fully recovered. Out of these, 9 claimed that the economy had surpassed the pre-disaster levels. The remaining five said that the economy in their communities had recovered somewhat since the earthquake. Only four communities were involved in a mutual aid project in 2011, and only one had NGO-involvement after the earthquake.

5.2.1 Demographic structure

Figure 6: Proportion of elderly and children in high-poverty communities
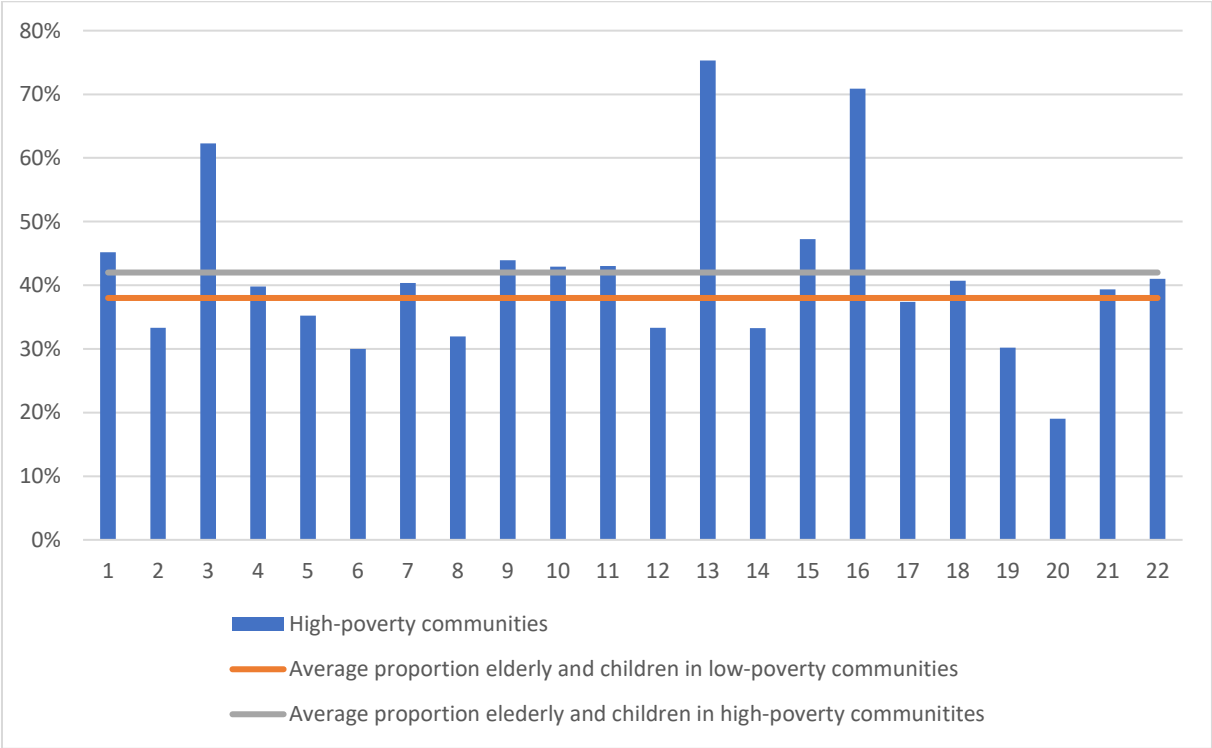
On average, the proportion of elderly and children is 38% in low-poverty communities, while the high-poverty communities have an average of 42% children and elderly. As expected, some of these communities show very high levels of unfavorable demographics, which also makes

the dependency ratios in these areas particularly high. In community 13, a rural village in Chaotian district, the proportion is the highest with 75%. This community is the smallest in terms of population, with just 170 permanent residents and 110 households. Out of these, over 30% were government-designated poor. Second up is community 16 with 256 households and 776 permanent residents, out of which 71% are elderly and children. The poverty prevalence is 18% in this community. Third community is number 3 with its 62% elderly and young people. This is also one of the largest communities in the sample, with 2168 resident and 790 households, and a poverty prevalence of 10%. However, only these three communities stand out remarkably in terms of share of children and elderly. Overall, the average difference in this demographic is not very large between low- and high-poverty communities.

As my data indicates, 9 out of the 22 sampled high-poverty communities show lower proportions of elderly and children than the average for low-poverty communities. In these communities, the dependency ratios are remarkably lower as well. For instance, community 20 in Songpan County, has 420 permanent residents and 75 households. In the community, 27% of the total residents are government-designated poor. Children and elderly only make up 19% of the total population, which is far lower than the average for low-poverty communities (38%). Another example is community 2 with 1950 permanent residents, out of which 10% were government-designated poor. This community has a 33% share of elderly and children. What this tells us is that unfavorable demographics is not a necessary condition for all high-poverty communities, and that this presumption cannot be verified by my data. There is, however, some occurrence of alarmingly high proportions of unfavorable demographics within some of these communities.

Based on the survey from 2011, I compared the proportion of this demographic in 2011 and 2018. What I found is that in 2011, the elderly and children made up 39% of the total population in both low- and high-poverty communities. In 2018, the low-poverty group still had the same proportion, while the number had risen to 42% in the high-poverty communities. On the basis of the data gathered, there has been an increase in unfavorable demographics in some of the high-poverty areas. Particularly striking is community 13 which had an increase in this demographic from 46% in 2011, to 75% in 2018. Second up is community 16 with an increase from 51% in 2011, to 71% seven years later. These communities contribute significantly to the

rise in the high-poverty communities as a whole. On the other side, there are three communities who have had a decrease in this demographic by over 40 points. Community 2 had a 77% share of elderly and children in 2011, while only 33% in 2018. Similarly, community 6 had a proportion of 75% elderly and children in 2011, and only 30% seven years after. Altogether, the demographic changes in these communities are varied and require further investigation. My data finds little hold for the assumption that high-poverty communities have a large proportion of children and elderly, and that this demographic has been on the rise.

5.2.2 Migration

Looking at the numbers, the dependency ratio is very high in some high-poverty communities. Community 13, for example, has a dependency ratio of 305%. I find it useful to look at migration to see if there is a pattern of high outmigration in communities with unfavorable demographics. High outmigration could explain the high proportion of unfavorable demographics in the communities.

*Figure 7: Proportion of outmigration*
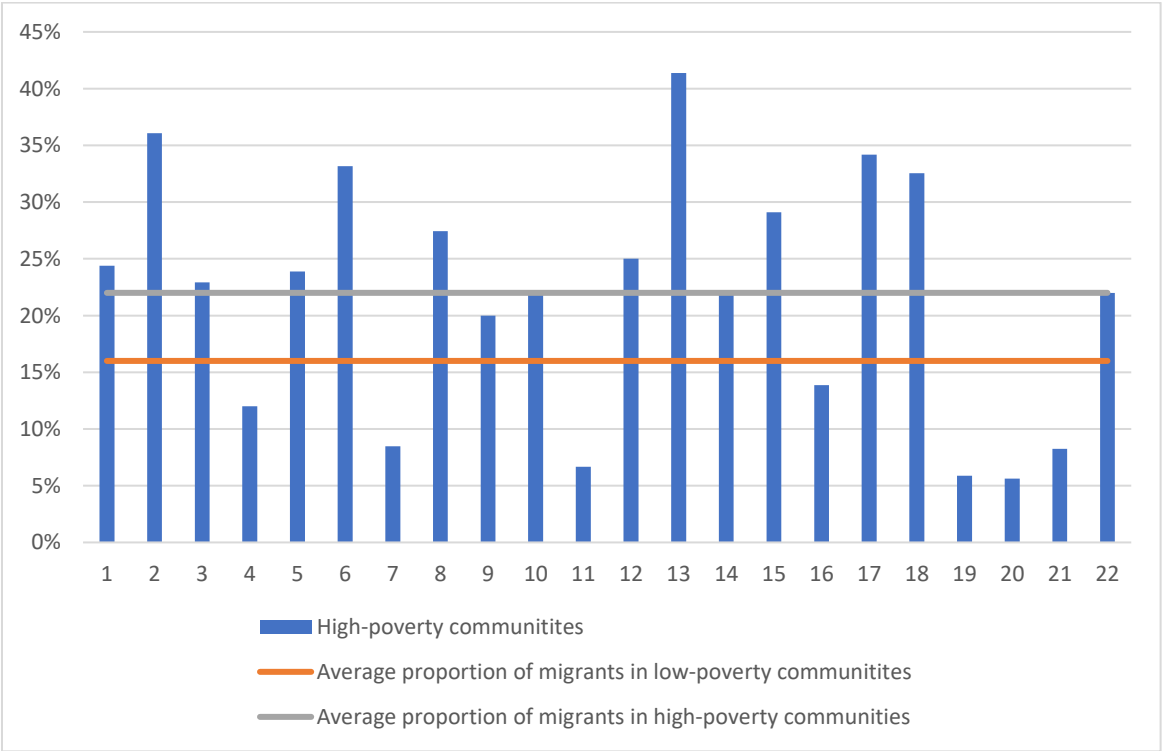
Overall, average migration outside the community is 22% in the high-poverty communities, while it is only 16% for the low-poverty communities. To begin with community 13, 41% of the population has migrated outside the community. Looking at the numbers, this might be a typical rural community in which the working population has migrated outside to find work, leaving the elderly and children behind. This is the largest rate of migration among the high-poverty communities. Second up is community 2 in which 36% of the population has migrated. When comparing with 2011, migration has on average gone down in the high-poverty communities. In 2011, the average proportion of migrants was 24% in high-poverty communities, and 13% in low-poverty communities. In other words, migration has gone down in high-poverty communities, but gone up in low-poverty communities from 2011 to 2018. Community 13 stands out again for having the highest increase in migrants, from 22% in 2011, to 41% in 2018. At the opposite end, community 19 and 20 had the highest decrease in migrants, from 39% and 37%, down to 6%. To summarize the demographic structure and migration, I find few patterns in the datasets between poverty incidence in 2018, and demographic composition and migration. In some communities, the share of elderly and children seems to be a result of high migration. Community 13 and 15 give this idea based on the data gathered. That does not seem to be the case in other communities. Community 16 has a large share of children and elderly, but has low shares of migration relative to the high and low-poverty community average.

5.2.3 Ethnicity

Sichuan is an area with a large share of minority population. In 2017, different ethnic minorities made up 61% of the total population of the whole province (China Statistical Yearbooks Database, 2019). This is the home of, among others, the Tibetans, Hui, Yi, and Qiang ethnic minorities. The earthquake struck some of the heavy populated ethnic areas, such as the Tibetan settings in Aba prefecture. In fact, some estimate that 10% of the Qiang population lost their lives in the earthquake (Abramson & Qi, 2011, p. 505).

Figure 8: Proportion of ethnic minorities
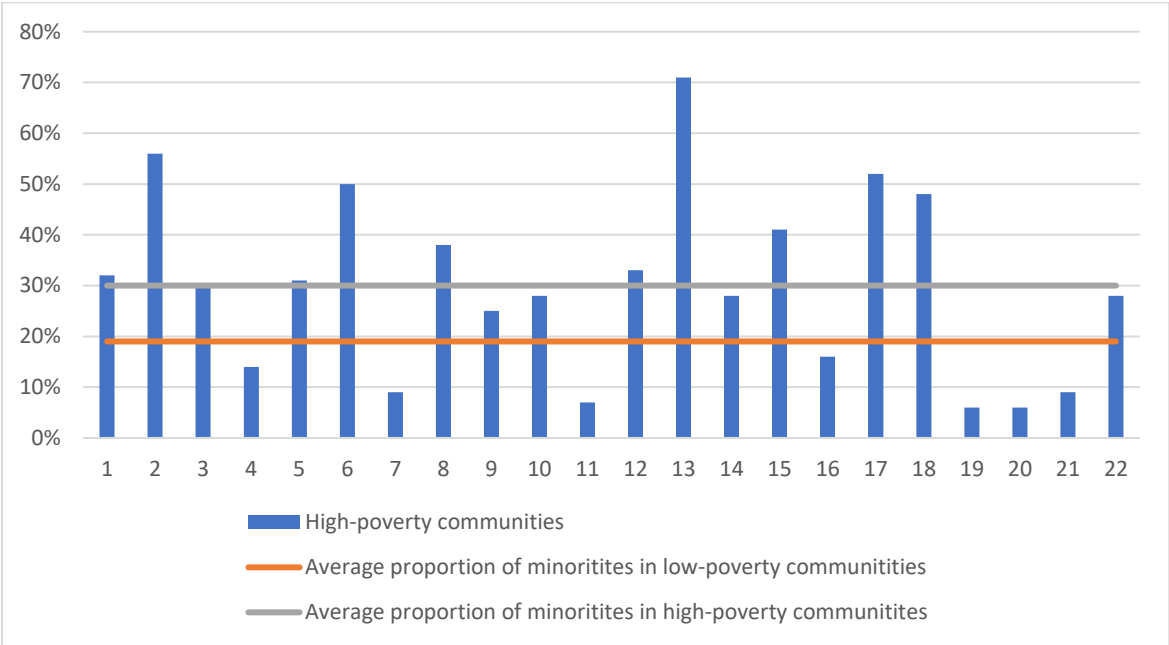
Ethnic minorities make up 16% of the total population in the sample. In total, 2% of the reported minorities have permanent residence in high-poverty communities. Calculations based on the survey show that the high-poverty communities have, on average, more members of ethnic minorities with 30% as opposed to 19% in low-poverty communities. Highest prevalence is in community 13 with 71%. This community also scored highest on the proportion of elderly and children, and migration. The highest total numbers of minority populations are in community 2 and 18, with 1100 and 1007 respectively. These make up 57% and 48% of the communities' total populations. Although the average numbers show higher prevalence of ethnic minorities in high-poverty communities, 7 out of 22 communities have remarkably lower shares of ethnic

36

minority populations than the average for low-poverty communities. I do not have access to data showing the proportion of ethnic minorities in 2011, and can therefore not track changes overtime. The findings are interesting nonetheless. At the one hand, certain communities appear to be much in accordance to presumptions. Community 2, 13, 17 and 18 all have high numbers of ethnic minorities, ranging from 48% to 71%. Community 13 stands out yet again by fulfilling every assumption so far. Other communities that stand out are 19 and 20, both of which have remarkably lower proportions of ethnic minorities, outmigration and unfavorable demographics. To summarize the demographic structures, my data finds little evidence that high-poverty communities have higher shares of elderly and children, ethnic minorities and outmigration than the low-poverty communities. The assumptions cannot be verified by my data.

5.2.4 Public services

Figure 9: Number of communities providing basic public services
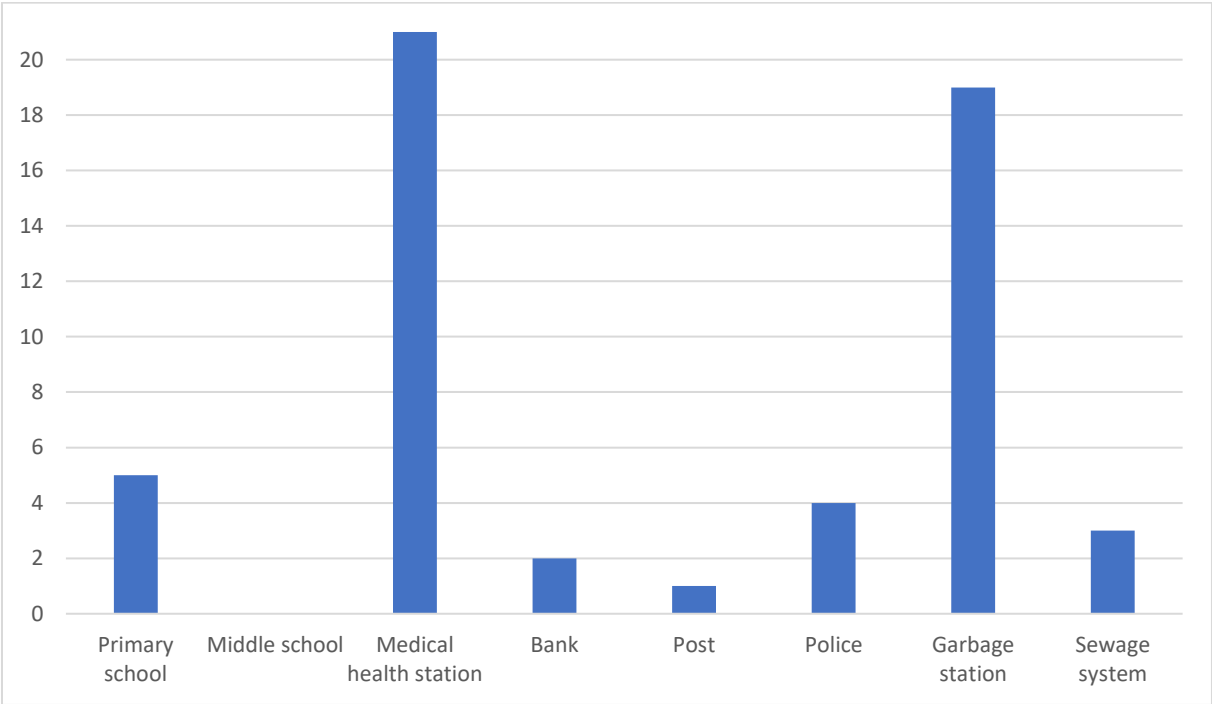
By 2018, every community in the dataset was accessible by road. In the high-poverty communities, only five were accessible by road before the earthquake. In the rural low-poverty communities, 36 were accessible by road prior to the earthquake. By the time of the 2018 survey, only five of the high-poverty communities had a primary school. None of them had a middle school in their community. Bank, post office and police station have the lowest frequencies, with two, one and four communities having one. Only three communities had a sewage processing system. Medical health stations were the most common public service among the high-poverty communities, where only one reported not having one. To highlight some findings, community 13 only had a medical health station and garbage disposal station in 2018, and none of the others. Community 19, on the other hand, only had a medical health station, and no other services. The community with most services is community 18, with a primary school, medical health station, police station and garbage disposal station. Overall, there are few public services in the high-poverty communities.

Table 3: Communities with a primary school

		Services in the village/ neighborhood committee/community: Primary school		
		Yes	No	Total
Area	Village	22	123	145
	Community	25	28	53
Total		47	151	198

Table 4: Communities with a middle school

		Services in the village/ neighborhood committee/community: Middle school		
		Yes	No	Total
Area	Village	11	134	145
	Community	17	36	53
Total		28	170	198

Some of the trends in the high-poverty communities are overlapping with the general trend in access to public services in the earthquake affected area. Only 47 out of the 198 sampled communities had a primary school in 2018. Only 18% of the sampled villages and 47% of urban communities had primary schools. Middle schools were the least common, where only 28 communities reported having one. Out of these, 11 were rural communities. What can be seen from the data, is that schools are not very common in local communities in the earthquake affected areas in 2018. Some interesting aspects emerge when comparing public services before the earthquake and ten years after. Six of the high-poverty communities who did not have a primary school in 2018, had one before the earthquake. At the other end, two communities that did not have a primary school in 2011, had one in 2018. No communities had middle schools in 2011 either. The greatest improvement is in the number of medical health stations, where seven high-poverty communities got one at some point after the earthquake. Overall, the high-poverty communities have access to few public services, but they do not differ much from the high-poverty communities.

5.2.5 Location in a government-designated poor county

Crosschecking the high-poverty communities with the list of poverty counties, I find that ten of the 22 high-poverty communities are located in government-designated poor counties.[3] Another three communities are located in counties that were designated poor until 2018 when they were taken off the list. These are in Beichuan and Mao County. The remaining nine are not in government-designated poor counties. Of the high-poverty communities, 19 communities had programs sponsored by the government, enterprises or other organizations since the earthquake. Three had no such programs since the earthquake. The list over government-designated poor villages is unfortunately not easy to obtain. Therefore, I don't know if any of my villages carry this label. Furthermore, my data does not show what programs were initiated in the communities. I don't know their scope, nor duration, nor what was implemented and how. Since this is a study with limited space, I have chosen to not look further into the programs. However, based on the data, some interesting findings emerge.

I found two striking occurrences. Out of the four communities which were involved in mutual aid programs in 2011, one had not been part of any specialized programs by the government, enterprises or other organization by 2011 nor 2018. This is community 8, the village in Pingwu County. What I find even more interesting is that this community is located in a government-designated poor county, yet it is not covered by any specialized programs which aim to developing the local economy or provide any other kinds of development support. Another similar case is in community 14 which is also located in a government-designated poor county. This community has not received any specialized program by the government, enterprises or other organizations. The community is located in Qingchuan County, has 970 permanent residents, and the poverty incidence is 17%. The last community not targeted by any specialized programs is community 3 in Zhongjiang County. Community 13, on the other hand, is in a government-designated poor county and has received programs by the government, enterprises and other organizations.

---

[3] See Appendix B for full list of high-poverty communities and government-designated poor counties.

6. Discussion

The findings from the community survey of the Wenchuan earthquake reconstruction tell an interesting story about poverty in the earthquake affected area. The overall area has a smaller share of poor individuals than the province and the country as a whole. I find that impressive considering the damages done by the earthquake. As a contrast, ten years after hurricane Katrina, the poverty levels were still the same as the pre-disaster levels in one of the hardest hit cities, New Orleans (Plyer, Shrinath, & Mack, 2015). Two destructive natural hazards have produced very different results ten years after. The high-poverty communities are spread across multiple counties and vary in size and poverty incidence. In line with the presumptions, some of the high-poverty communities show high levels of unfavorable demographics. Particularly striking is community 13 with more than 70% elderly and children. Some of the communities are high migration communities, such as 13 and 2. The same two communities also have high shares of ethnic minority population. Overall, the high-poverty communities have few public services available.

Table 5: Summary of findings

Poverty incidence measured as the headcount ratio	Low-poverty communities (average)	High-poverty communities (average)
Individuals (%)	2	16
Households (%)	3	18
Demographic structure	**Low-poverty communities (average)**	**High-poverty communities (average)**
Elderly and under 18 (%)	38	42
Ethnic minorities (%)	19	30
Migration (%)	16	22
Infrastructure	**Low-poverty communities**	**High-poverty communities**
Communities with primary school (%)	24	22
Communities with a middle school (%)	16	0
Communities with a medical health station (%)	89	95
Communities with a sewage system (%)	45	14
Communities with a garbage disposal (%)	85	86
Communities with a police station (%)	54	18
Communities with a bank (%)	38	9
Communities with a post (%)	27	4,5
Accessibility by road (%)	100	100

Contrary to the theoretic assumptions, the data analyzed here shows that not all high-poverty communities are characterized by high proportions of the chosen demographics. On the contrary, some of the communities do not fulfil any of the assumptions. The average proportion of unfavorable demographics in high-poverty communities is higher, but the numbers are driven up by the communities with remarkably higher proportions than other communities. Demographic composition is not a good characteristic describe the impoverished communities as a whole. In fact, certain low-poverty communities have these demographic features and no poverty. For instance, community 121 in An County has 1130 residents, where children and the elderly make up 72% of the total population. The village has a poverty incidence of 2%. Similar findings are found with regard to ethnic minorities. Community 48, a village in Zhongjiang County, has 500 residents and 80% ethnic minorities. The community has 0% poverty. These numbers illustrate how these demographic features can be found in multiple low-poverty areas, but not in all high-poverty communities. The complex relationship between living in certain places and poverty outcomes is blurred in the Wenchuan earthquake affected communities.

My data also uncovers some of the problems related to the use of poverty lines as a measure of poverty within a large area. As previously mentioned, the highest total number of poor individuals occurred in a low-poverty community. Additionally, many high-poverty communities are located in counties that are not government-designated poor. Some estimates show that 40% of China's poor population lives outside government-designated poor counties (Y. Liu et al., 2017). What this illustrates, is that applying an individual poverty line to a large area becomes a less accurate means of targeting the poor, because the numbers are sensitive to high and low values. My data confirms that actually nearly half of the impoverished population were located in counties which are not government-designated poor. This illustrates the concerns that objective poverty lines applied on the average for a whole county fails to unveil pockets of poverty within the counties. The overall area might have low levels of poverty, while certain areas within the county might still be highly impoverished. For instance, per capita net income over large geographic areas might disguise places in which poverty prevails because these places are few in comparison to places with low, if any, poverty. Additionally, two counties may have the same number of absolute poor, but only one might qualify for poverty county status and development opportunities that follow such status. The large focus on helping government-designated poor counties will fail to help the populations who live outside these areas, even if they are high in total numbers.

When looking at specialized programs in these communities, I cannot help but feel that it is somewhat arbitrary which communities have received governmental programs and which have not. To take community 13 as an example again, it has been included in specialized programs from multiple actors. The poverty incidence is still high in this community. Other communities are even located in government-designated poor counties but have not had any programs. In the case of community 13, it could be interesting for further research to see what programs were established, and what their consequences have been. It would also be interesting to see why some of the communities have not had any programs, when certain official indicators might say that they should have. This calls to question the targeting system of the Chinese poverty alleviation efforts. More research should be done on why some communities get specialized programs while others do not, even when the poverty incidence in both places are similarly high. Furthermore, having found communities in counties within all three categories of poor, non-poor, and poor until 2018, my findings raise some other concerns. Seeing that several counties have been removed from the official list of poverty counties, it is important to follow up on the poverty situation in these counties. Counties can apply to be removed from the poverty list when their overall poverty incidence is 3% or lower (2% in the eastern provinces). My data illustrates that removing a county from the list does not mean that there are not areas within the county which still suffer from large poverty prevalence.

Additionally, studies should follow up whether the formerly impoverished population is capable of staying out of poverty in the long-term, or if they will relapse when the county loses its benefits. Future research on poverty in China should explore what happens to the the poverty incidence in counties which are no longer on the poverty list, to see if and how many people fall back into poverty. Research should be done to compare various programs aimed at eradicating poverty and boosting the economy in different places. For instance, it would be interesting to do a comparative study of an area or program that has been successful, and one that has not. This type of research might give useful insight into how these programs work, and what their consequences might be. My thesis has not looked into who is poor and why, in these communities. Instead, I found that the community level characteristics do not differ much between low- and high-poverty communities. It would perhaps be interesting to look at micro level data of households and individuals to uncover the underlying causes of poverty, and paint a more diverse picture of the poverty situation in these communities, and China in general.

7. Conclusion

The overall efforts to rebuild the areas affected by the 2008 Wenchuan earthquake have been impressive. Reconstruction was finished within three years, leaving some of the affected communities with economic levels that preceded the pre-earthquake levels. Over the course of ten years, the affected area has seen great development. This development is both the result of the reconstruction process and the general development in the region, and China as a whole. This thesis set out to find out more about the poverty incidence in the Wenchuan earthquake affected communities ten years after the disaster. Altogether, 2% of the individuals living in the Wenchuan earthquake affected area in Sichuan were government designated poor in 2018. Measuring poverty as the head count ratio showed that 44 out of the 195 sampled communities had 0-0.9% poverty in 2018. Out of 195 communities, 23 had a poverty prevalence of 10% or more, leaving the remaining communities somewhere in between. Overall, 3% of the households living in the earthquake affected communities were government-designated poor in 2018. That is a fairly high reduction in poverty incidence from 11% one year after the disaster.

With the exception of one urban community, all highly impoverished communities are rural communities. The high-poverty-stricken communities are evenly distributed in government-designated poverty and non-poverty counties. In addition, these communities have very few public services. Most communities have medical health stations and a garbage disposal station, and some have primary schools, bank, and post office. None of the high-poverty communities had a middle school in 2018. Some of the sampled communities had high proportions of elderly and children, as well as ethnic minorities. Other communities were quite the opposite. My data shows that some of the high-poverty communities have more in common with low-poverty communities than they have with each other. When I began my research for this thesis, I was hoping to find a group of high-poverty communities with many things in common. What I found instead, is a very diverse group with their individual set of characteristics.

The findings in this thesis demonstrate that China's poverty situation is complex. The high-poverty communities vary in size, poverty incidence, and demographic composition. Seeing how half are located outside government-designated poor counties, one is led to question the existing targeting system and general poverty measurement system. Questions can be raised of what mechanisms are in place to lift those out of poverty who are not eligible for specialized projects. Challenges are far from overcome. As the government is well aware, the remaining poverty situation in the country is harder to solve than previously. One is dealing with an impoverished population that has not been lifted out of poverty through the existing poverty alleviation efforts. It goes to show that the remaining poverty problem faces challenges which might not be solved through existing systems and policies. For example, even if job security is guaranteed for everyone as a means of reaching the poverty eradication goal, there will still be a demographic that will not necessarily benefit from it because they are not in the work force.

As the distinction between high- and low-poverty areas is becoming less obvious, it highlights that the problems of poverty are complex. As the impoverished communities start to look more like the non-impoverished, it raises the question if there is one poverty alleviation solution that fits all. The Wenchuan earthquake affected areas offer a unique insight into China's poverty issues, especially given the region's history with disasters. The Wenchuan earthquake reconstruction and development is a unique case for the Chinese government to learn from for future natural disasters. Both the poverty reduction and the reconstruction efforts are overall impressive. Still, there are many intricate problems to be resolved. One thing is the remaining poverty issues, and another is vulnerability and the risk of suffering damage and loss in future natural hazards. Whether the great reconstruction efforts we saw in the Wenchuan case can serve as a reassurance that China is equipped to handle future disasters, remains yet to be seen.

References

Abramson, D. B., & Qi, Y. (2011). "Urban-Rural Integration" in the Earthquake Zone: Sichuan's Post-Disaster Reconstruction and the Expansion of the Chengdu Metropole. *Pacific Affairs, 84*(3), 495-523.

Alkire, S. (2015). *Multidimensional poverty measurement and analysis*. Oxford: Oxford University Press.

Alkire, S., & Fang, Y. (2019). Dynamics of Multidimensional Poverty and Uni-dimensional Income Poverty: An Evidence of Stability Analysis from China. *An International and Interdisciplinary Journal for Quality-of-Life Measurement, 142*(1), 25-64. doi:10.1007/s11205-018-1895-2

Asian Development Bank. (2012). *Handbook on poverty and social analysis : a working document*. Mandaluyong, Philippines: Asian Development Bank.

Beck, U. (1992). *Risk society : towards a new modernity*. London: Sage.

Benabou, R., Banerjee, A. V., & Mookherjee, D. (Eds.). (2006). *Understanding poverty*. Oxford: Oxford University Press.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford: Oxford University Press.

Cao, M., Xu, D., Xie, F., Liu, E., & Liu, S. (2016). The influence factors analysis of households' poverty vulnerability in southwest ethnic areas of China based on the hierarchical linear model: A case study of Liangshan Yi autonomous prefecture. *Applied Geography, 66*, 144-152. doi:10.1016/j.apgeog.2015.11.016

Chen, C. (2017). 牢牢扭住精准扶贫的"牛鼻子"—论习近平的健康扶贫观及其政策意义 (Firmly twisting the "bull nose" of precision poverty alleviation -On Xi Jinping's View of Health and Poverty Alleviation and Its Policy Significance). *湖南社会科学 (Hunan Social Science)*(6), 63-70.

Chen, K. Z., Zhang, Q., & Hsu, C. (Eds.). (2016). *Earthquake Lessons from China : coping and rebuilding strategies*. Washington DC: International Food Policy Research Institute.

Chen, Y., Yang, Z., Zhang, Y., & Liu, C. (2013). 从汶川地震到芦山地震 (From Wenchaun Earthquake to Lushan Earthquake). *中国科学:地球科学 (Chinese Science: Earth Science), 06*(14), 1064-1072.

Chen, Z. (2017). 论民族地区精准扶贫目标瞄准机制构建 (On the construction of the targeting mechanism of precise poverty alleviation). *广西民族研究 (Guangxi Ethnic Studies), 138*(6), 166-172.

China Statistical Yearbooks Database. (2019). Population and Natural Environment - Sichuan. In: China Data Insight.

Chronic Poverty Research Centre. (2009). *The chronic poverty report 2008-09: Escaping poverty traps*. Manchester: Chronic Poverty Research Centre.

Dalen, K., Flatø, H., Liu, J., & Zhang, H. (2012). *Recovering from the Wenchuan Earthquake, Living Conditions and Development in Disaster Areas 2008-2011*. Oslo: Fafo.

Ding, J. (2014). 多维贫困的理论基础、测度方法及实践进展 (The theoretical basis, measurement methods and practical progress of multidimensional poverty). *经济理论与方法 (Economic Theory and Method), 24*(1), 61-70.

Duckett, J. (2012). China's 21st-century welfare reforms. *Local Economy: The Journal of the Local Economy Policy Unit, 27*(5-6), 645-650. doi:10.1177/0269094212444574

Dunford, M., & Li, L. (2011). Earthquake reconstruction in Wenchuan: Assessing the state overall plan and addressing the 'forgotten phase'. *Applied Geography, 31*(3), 998-1009. doi:10.1016/j.apgeog.2011.01.001

Fan, X., Juang, C. H., Wasowski, J., Huang, R., Xu, Q., Scaringi, G., van Vesten, C. J., Havenith, H.-B. (2018). What we have learned from the 2008 Wenchuan Earthquake and its aftermath: A decade of research and challenges. *Engineering Geology, 241*, 25-32. doi:10.1016/j.enggeo.2018.05.004

Feng, S., Lu, J., Nolen, P., & Wang, L. (2016). The effect of the Wenchuan earthquake and government aid on rural households. In K. Z. chen, Q. Zhang, & C. Hsu (Eds.), *Earthquake Lessons from China*. Washington DC: International Food Policy Research Institute.

Fothergill, A., & Peek, L. (2004). Poverty and Disasters in the United States: A Review of Recent Sociological Findings. *Journal of the International Society for the Prevention and Mitigation of Natural Hazards, 32*(1), 89-110. doi:10.1023/B:NHAZ.0000026792.76181.d9

Füssel, H.-M. (2007). Vulnerability: A generally applicable conceptual framework for climate change research. *Global Environmental Change, 17*(2), 155-167. doi:10.1016/j.gloenvcha.2006.05.002

Gaillard, J. C. (2010). Vulnerability, capacity and resilience: Perspectives for climate and development policy. *Journal of International Development, 22*(2), 218-232. doi:10.1002/jid.1675

Glauben, T., Herzfeld, T., Rozelle, S., & Wang, X. (2012). Persistent Poverty in Rural China: Where, Why, and How to Escape? *World Development, 40*(4), 784-795. doi:10.1016/j.worlddev.2011.09.023

Guan, X. (2014). Poverty and anti-poverty measures in China. *China Journal of Social Work, 7*(3), 270-287. doi:10.1080/17525098.2014.962758

Guo, X. (2005). 论贫困概念的演进 (The evolution of the concept of poverty). *江西社会科学 (Jiangxi Social Sciences), 11*, 38-43.

Hallegatte, S. p., Vogt-Schilb, A., Bangalore, M., & Rozenberg, J. (2017). *Unbreakable : building the resilience of the poor in the face of natural disasters*. Washington, DC: World Bank Group.

Han, W., Liang, C., Jiang, B., Ma, W., Zhang, Y., & Han, W. (2016). Major Natural Disasters in China, 1985-2014: Occurrence and Damages. *Internationa Journal of Environmental Reseach and Public Health, 13*(11), 1118. doi:10.3390/ijerph13111118

Harris, J., & White, V. (2018). Relative poverty. In O. Reference (Ed.), *A Dictionary of Social Work and Social Care* (2 ed.): Oxford University Press.

Huang, C. (2014). 灾害管理与长期扶贫战略整合的对策与路径—基于汶川地震灾后贫困村重建的分析 (Countermeasures and paths for integration of disaster management

and poverty alleviation - An analysis based on the reconstruction of poor villages aftetr the Wenchuan earthquake). 开发研究 *(Development Research), 170*(1), 8-12.

Huang, C. (2016). 中国扶贫开发道路研究：评述与展望 (Research on China's road to poverty alleviation and development: Review and outlook). *中国农业大学学报 (社会科学版) (Journal of China's Agricultural University (Social Science Edition)), 33*(5), 5-17.

Ji, S. (2017). 习近平精准扶贫思想逻辑体系论略 (A brief discussion of Xi Jinping's System of Precise Poverty Alleviation). *山东社会科学 (Shandong Social Sciences), 266*(10), 127-131.

Jia, H., Chen, F., Pan, D., & Zhang, C. (2018). The Impact of Earthquake on Poverty: Learning from the 12 May 2008 Wenchuan Earthquake. *Sustainability, 10*(12), 4704. doi:10.3390/su10124704

Johnston, R. (2008). Survey Methodology. In J. M. Box-Steffensmeier, H. E. Brady, & D. Collier (Eds.), *The Oxford Handbook of Political Methodology*. Oxford: Oxford University Press.

Khin, E. W. S. (2010). Transforming China's Poverty Crisis : Challenges and Issues. *US-China Law Review, 7*(1), 42-50.

Lau, M. (2017). China's list of poorest counties shrinks for the first time in 30 years. *South China Morning Post.* Retrieved from https://www.scmp.com/news/china/policies-politics/article/2118119/chinas-list-poorest-counties-shrinks-first-time-30

Leavy, P., & Phillips, B. D. (2014). Qualitative Disaster Research. In P. Leavy (Ed.), *The Oxford Handbook of Qualitative Research* (1 ed.). New York: Oxford University Press.

Li, X., Fan, L., & Leng, S. X. (2018). The Aging Tsunami and Senior Healthcare Development in China. *Journal of the American Geriatrics Society, 66*(8), 1462-1468. doi:10.1111/jgs.15424

Li, Y., Huang, R., Densmore, A. L., Zhou, R., & Cao, S. (2009). 汶川8.0级地震的基本特征及其研究进展 (Basic Features and Research Progresses of the Wenchuan Ms 8.0 Earthquake). *四川大学学报 (工程科学版) (Journal of Sichuan University (Engineering Science Edition)), 03*(5), 7-25.

Li, Y., Su, B., & Liu, Y. (2016). Realizing targeted poverty alleviation in China: People's voices, implementation challenges and policy implications. *China Agricultural Economic Review, 8*(3), 443-454. doi:doi:10.1108/CAER-11-2015-0157

Liu, M., Wang, J., Tao, R., & Murphy, R. (2009). The Political Economy of Earmarked Transfers in a State-Designated Poor County in Western China: Central Policies and Local Responses. *The China Quarterly, 200*, 973-994. doi:10.1017/S0305741009990580

Liu, Q., Wang, R. Y., & Dang, H. (2018). The Hidden Gaps in Rural Development: Examining Peasant–NGO Relations through a Post-earthquake Recovery Project in Sichuan, China. *The China Quarterly, 233*, 43-63. doi:10.1017/S0305741017001722

Liu, Y., Guo, Y., & Zhou, Y. (2018). Poverty alleviation in rural China: policy changes, future challenges and policy implications. *China Agricultural Economic Review, 10*(2), 241-259. doi:doi:10.1108/CAER-10-2017-0192

Liu, Y., Liu, J., & Zhou, Y. (2017). Spatio-temporal patterns of rural poverty in China and targeted poverty alleviation strategies. *Journal of Rural Studies, 52*, 66-75. doi:10.1016/j.jrurstud.2017.04.002

Lu, C. (2010). Who is poor in China? A comparison of alternative approaches to poverty assessment in Rural Yunnan. *The Journal of Peasant Studies, 37*(2), 407-428. doi:10.1080/03066151003595242

Lu, H. (2010). 汶川地震灾后恢复重建对贫困社区的影响 (The impact of post-earthquake reconstruction in Wenchuan on poor communities). *江汉论坛 (Jianghan Tribune* (09), 119-123.

National Bureau of Statistics. (2016). *中国农村贫困监测报告2016 (Poverty monitoring report of rural China 2016)*. Beijing: China Statistical Press.

National Bureau of Statistics. (2018). *中国农村贫困监测报告2017 (Poverty monitoring report of rural China 2017)*. Beijing: China Statistical Press.

Odhiambo, W., Omiti, J. O., & Muthaka, D. I. (2014). *Quantitative and Qualitative Methods for Poverty Analysis*. Nairobi: Kenya Institute for Public Policy Research.

Osmani, S. R. (2003). *Evolving views on poverty : concept, assessment, and strategy* (Vol. no. 7/July 2003). Manila: Asian Development Bank, Regional and Sustainable Development Department.

Park, A., & Wang, S. (2010). Community-based development and poverty alleviation: An evaluation of China's poor village investment program. *Journal of Public Economics, 94*(9), 790-799. doi:10.1016/j.jpubeco.2010.06.005

Park, A., Wang, S., & Wu, G. (2002). Regional poverty targeting in China. *Journal of Public Economics, 86*(1), 123-153. doi:10.1016/S0047-2727(01)00108-6

Plyer, A., Shrinath, N., & Mack, V. (2015). *The New Orleans Index at Ten - Measuring Greater New Orleans' Progress toward Prosperity*. Retrieved from https://s3.amazonaws.com/gnocdc/reports/TheDataCenter_TheNewOrleansIndexatTen.pdf

Rodríguez, H., Donner, W., & Trainor, J. E. (Eds.). (2018). *Handbook of Disaster Research* (2nd ed. 2018 ed.). Cham: Springer International Publishing.

Satterthwaite, D. (2003). The Millennium Development Goals and urban poverty reduction: great expectations and nonsense statistics. *Environment & Urbanization, 15*(2), 179-190. doi:10.1177/095624780301500208

Satterthwaite, D. (2004). *The under-estimation of urban poverty in low- and middle-income nations*. London: International Institute for Environment and Development.

Sen, A. (1982). *Poverty and famines : an essay on entitlement and deprivation*. Oxford: Clarendon Press.

Shepard, A., Mitchell, T., Lewis, K., Lenhardt, A., Jones, L., Scott, L., & Muir-Wood, R. (2013). *The geography of poverty, disasters and climate extremes in 2030*. Retrieved from https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8633.pdf

Shi, C. (2018). 中国特色扶贫开发道路不断拓展 (The road to poverty alleviation and development with Chinese characteristics continues to expand). *The State Council Leading Group Office of Poverty Alleviation and Development* Retrieved from

http://www.cpad.gov.cn/art/2018/8/27/art_56_88393.html?fbclid=IwAR2giIj9gziq24L dal7sIQW_wm4onrf5vfDGBw9ShRUwGhu4GZXy_cBFQ1M

Shi, P. (2016). *Natural Disasters in China*. Berlin: Springer

Sim, T., & Jun, L. Y. (2018). Natural Hazards Governance in China. In *Oxford Research Encyclopedia of Natural Hazard Science. Ed*: Oxford University Press.

Smeeding, T. M. (2016). Poverty Measurement. In D. Brady & L. M. Burton (Eds.), *The Oxford Handbook of the Social Science of Poverty* (1 ed.). New York: Oxford University Press.

Solinger, D. J., & Hu, Y. (2012). Welfare, Wealth and Poverty in Urban China: The Dibao and Its Differential Disbursement *The China Quarterly, 211*(211), 741-764. doi:10.1017/S0305741012000835

Song, Y., & Zhao, J. (2015). 中国的贫困现状与特征：基于等值规模调整后的再分析 (The status quo and characteristics of poverty in China: Reanalysis based on Equivalent Scale Adjustment). *管理世界 (Management World), 10*, 65-77.

Sorace, C. (2014). China's Vision for Developing Sichuan's Post-Earthquake Countryside: Turning Unruly Peasants into Grateful Urban Citizens. *The China Quarterly, 218*(1), 404-427. doi:10.1017/S0305741014000642

Sorace, C. (2015). The Communist Party's Miracle? The Alchemy of Turning Post-Disaster Reconstruction into Great Leap Development. *Comparative Politics, 47*(4), 479-498.

Sorace, C. (2017). *Shaken authority : China's Communist Party and the 2008 Sichuan earthquake*. Ithaca, New York, London: Cornell University Press.

State Council of the PRC. (2008). *国务院关于印发汶川地震灾后恢复重建总体规划的通知 (The State Overall Planning for Post-Wenchuan Earthquake Restoration and Reconstruction)*. Retrieved from http://www.gov.cn/zwgk/2008-09/23/content_1103686.htm

Strömberg, D. (2007). Natural Disasters, Economic Development, and Humanitarian Aid. *The Journal of Economic Perspectives, 21*(3), 199-222. doi:10.1257/jep.21.3.199

Sun, M., Chen, B., Ding, W., & Shi, G. (2010). 自然灾害发生前后灾区农户收入影响因素 的对比分析 —以汶川为例 (Comparative analysis of factors affecting farmers' income before and after natural disasters - A study of Wenchuan). *技术经济 (Technological Econommy), 29*(5), 88-118.

Sun, M., Chen, B., Ren, J., & Chang, T. (2010). Natural Disaster's Impact Evaluation of Rural Households' Vulnerability: The case of Wenchuan earthquake. *Agriculture and Agricultural Science Procedia, 1*, 52-61. doi:10.1016/j.aaspro.2010.09.007

Sun, Y. (2013). 中国农村贫困线调整的契机与扶贫政策—以贫困指标为依据 (The Opportunity of China's Rural Poverty Line Adjustment and Poverty Alleviation Policy- Based on poverty indicators). *贵州财经大学学报 (Journal of Guizhou University of Finance and Economics), 165*(4), 98-105.

Teets, J. C. (2009). Post-Earthquake Relief and Reconstruction Efforts: The Emergence of Civil Society in China? . *The China Quarterly, 198*(198), 330-347. doi:10.1017/S0305741009000332

The World Bank. (2019). Poverty & Equity Data Portal - China. Retrieved from http://povertydata.worldbank.org/poverty/country/CHN

UNDP. (2019). The 2018 Global Multidimensional Poverty Index. Retrieved from http://hdr.undp.org/en/2018-MPI

UNDP China. (2016). *The Living Standards Dimension of the Human Development Index. Measuring Poverty with Big Data*. Retrieved from http://www.cn.undp.org/content/china/en/home/library/poverty/the-living-standards-dimension-of-the-human-development-index--m.html

United Nations. (2019). Sustainable Development Goals. Retrieved from https://www.un.org/sustainabledevelopment/

United Nations Environmental Programme. (2019). *Global Environment Outlook*. Cambridge: Cambridge University Press.

Wang, F., Guo, W., Hu, Y., & Liu, L. (2008). 汶川大地震灾民创伤后急性应激期心理危机干预的实践与研讨 (Practice and discussion on psychological crisis intervention in the acute phase of posttraumatic stress from the Wenchuan earthquake). *成都医学院学报 (Journal of Chengdu Medical College)*(2), 79-81+88.

Wang, W., & Wang, S. (2016). 积极老龄化理念下老年精准扶贫的困境及应对路径 (The difficulties and countermeasures of the elderly's accurate poverty alleviation under the concept of active aging). *公共管理/社会建设 (Public management / social construction)*(2), 136-142.

Wang, Y., & Chen, Y. (2017). Using VPI to Measure Poverty-Stricken Villages in China. *An International and Interdisciplinary Journal for Quality-of-Life Measurement, 133*(3), 833-857. doi:10.1007/s11205-016-1391-5

Wang, Y., & Dong, L. (2010). 我国灾后地方政府对口支援模式初探——以各省市援建汶川地震灾区为例 (A Preliminary Study on the Counterpart Support Model in China after Disasters—— A study of the Wenchuan Earthquake Relief Areas Aided by Provinces and Cities). *当代世界与社会主义 (Contemporary World & Socialism), 01*, 131-136.

Wang, Z., & Peng, R. (2018). 汶川十年：汶川地震灾后恢复重建研究的热点与趋势——基于CiteSpace Ⅴ的可视化分析 (Wenchuan Ten Years: The Hotspots and Trends of Wenchuan Earthquake Recovery and Reconstruction Research——Visual Analysis Based on CiteSpace V). *西南民族大学学报(人文社科版) (Journal of Southwest Minzu University (Humanities and Social Science)), 06*, 11-19.

Ward, P. S. (2016). Transient Poverty, Poverty Dynamics, and Vulnerability to Poverty: An Empirical Analysis Using a Balanced Panel from Rural China. *World Development, 78*, 541-553. doi:10.1016/j.worlddev.2015.10.022

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk : natural hazards, people's vulnerability and disasters* (2nd ed.). London: Routledge.

Xie, H., & Xie, Z. (2017). 中国特色扶贫开发道路研究 (Research on the road of poverty alleviation and development with Chinese characteristics). *公共治理 (Public Governance), 5*, 142-150.

Xinhua. (2017). Full text of Xi Jinping's report at 19th CPC National Congress. Retrieved from

http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf

Xu, B. (2014). Consensus Crisis and Civil Society: The Sichuan Earthquake Response and State-Society Relations. *The China Journal, 71*, 91-108. doi:10.1086/674555

Xu, C., Dai, F., & Xu, X. (2010). 汶川地震滑坡灾害研究综述 (An Overview of Wenchuan Earthquake-induced Landslides). *地质论评 (Geographical Review), 06*(13), 860-874.

Xu, P., Lu, X., Xi, Z., & Zhang, H. (2014). Post-Wenchuan Earthquake Reconstruction and Development in China. In N. Kapucu & T. Liou (Eds.), *Disaster and Development - Examining Global Issues and Cases*. Cham: Springer.

Yan, K. (2016). *Poverty Alleviation in China : A Theoretical and Empirical Study*. Berlin, Heidelberg: Springer.

Yin, B., Ma, Y., & Hu, J. (2017). 脱贫攻坚背景下我国减灾与脱贫协同关系研究 (Research on the Chinese disaster reduction and poverty alllleviation). *社会政策研究 (Social Policy Research), 05*, 74-88.

Yong, C., & Booth, D. C. (2011). *The Wenchuan Earthquake of 2008 : Anatomy of a Disaster*. Berlin, Heidelberg: Springer.

You, C., Cheng, X., & Yao, L. (2009). How China responded to the May 2008 earthquake during the emergency and rescue period. *Journal of Public Health Policy, 30*(4), 379. doi:10.1057/jphp.2009.30

Zhang, C., Xu, Q., Zhou, X., Zhang, X., & Xie, Y. (2014). Are poverty rates underestimated in China? New evidence from four recent surveys. *China Economic Review, 31*, 410-425. doi:10.1016/j.chieco.2014.05.017

Zhang, H. (2016). Household vulnerability and economic status during disaster recovery and its determinants: a case study after the Wenchuan earthquake. *Journal of the International Society for the Prevention and Mitigation of Natural Hazards, 83*(3), 1505-1526. doi:10.1007/s11069-016-2373-2

Zhang, H., Christophersen, M., Dalen, K., Liu, J., & Pedersen, J. (2018). *Reconstructing a Future: Ten years after the Wenchuan earthquake*. Oslo: Fafo.

Zhang, H., & Tao, Z. (2018). Evaluating China's Paired-Assistance Policy (PAP) in Response to the Wenchuan Earthquake: A Sustainability Perspective. *Sustainability, 10*(10), 3732. doi:10.3390/su10103732

Zhang, Q., & Shi, Z. (2017). 我国教育扶贫政策创新及实践研究 (Research on the Innovation and Practice of Education Poverty Alleviation Policy in China). *贵州社会科学 (Guizhou Social Sciences), 328*(4), 154-160.

Zhi, J., Yao, Y., & Cao, J. (2017). 精准扶贫背景下中国农村多维贫困分析 (Analysis of multidimensional poverty in rural China). *经济问题研究 (Economic research), 324*(1), 14-26.

Zhong, K. (2013). 对口支援:起源、形成及其演化 (Paired Assistance in China: Origins, Formation and Development). *甘肃行政学院学报 (Journal of Gansu Administration Institute), 04*, 14-24.

Zhong, K., & Lu, X. (2015). 'One in Trouble, All to Help': The Paired Assistance Program to Disaster-Affected Areas in China. In C. Brassard, D. W. Giles, & A. M. Howitt (Eds.),

Natural Disaster Management in the Asia-Pacific. Policy and Governance Heidelberg: Springer.

Zhong, K., & Lu, X. (2018). Exploring the administrative mechanism of China's Paired Assistance to Disaster Affected Areas programme. *Disasters, 42*(3), 590-612. doi:10.1111/disa.12262

Zhu, H., & Walker, A. (2018). Pension system reform in China: Who gets what pensions? *Social Policy & Administration, 52*(7), 1410-1424. doi:10.1111/spol.12368

Zuo, C. (Ed.) (2019). *The Evolution of China's Poverty Alleviation and Development Policy (2001-2015)*. Singapore: Imprint: Springer.

Appendix A

Table 1: List of donors, budgets and number of projects

Partners	Funding (million RMB)	Number of projects
Guangdong Province–Wenchuan County	11,200	702
Shandong Province–Beichuan County	12,000	369
Zhejiang Province–Qingchuan County	8,500	538
Jiangsu Province–Mianzhu city	11,000	295
Shanghai city–Dujiangyan city	8,250	117
Beijing city–Shifang city	7,000	108
Henan Province–Jiangyou city	3,002	302
Hebei Province–Pingwu County	2,800	108
Liaoning Province–An County	3,400	88
Fujian Province–Pengzhou city	4,734	143
Shanxi Province–Mao County	2,162	226
Hunan Province–Li County	2,010	99
Jilin Province–Heishui County	1,297	201
Anhui Province–Songpan County	2,130	320
Jiangxi Province–Xiaojin County	1,300	51
Hubei Province–Hanyuan County	2,115	116
Chongqing city–Chongzhou city	1,700	111
Heilongjiang Province–Jiange County	1,550	146
Tianjin Province–Shaanxi Province	2,237	121
Shenzhen city–Gansu Province	3,000	165
Total	**91,387**	**4,326**

Source: Feng, S., Lu, J., Nolen, P., & Wang, L. (2016). The effect of the Wenchuan earthquake and government aid on rural households. In K. Z. chen, Q. Zhang, & C. Hsu (Eds.), *Earthquake Lessons from China*. Washington DC: International Food Policy Research Institute.

Appendix B

Community	City/district	County
1	Deyang	Zhongjiang County
2	Deyang	Zhongjiang County
3	Deyang	Zhongjiang County
4	Deyang	Mianzhu County
5	Mianyang	Santai County
6	Mianyang	Santai County
7	Mianyang	Beichuan County
8	Mianyang	Pingwu County
9	Mianyang	Jiangyou City
10	Mianyang	Jiangyou City
11	Guangyuan	Lizhou District
12	Guangyuan	Chaotian District
13	Guangyuan	Qingchuan County
14	Guangyuan	Qingchuan County
15	Guangyuan	Qingchuan County
16	Guangyuan	Jiange County
17	Guangyuan	Jiange County
18	Guangyuan	Jiange County
19	Aba	Mao County
20	Aba	Songpan County
21	Aba	Jiuzhaigou County
22	Mianyang	Beichuan County

White= not government-designated poor county
Yellow= government-designated poor county
Blue= Was government-designated poor county until 2018