Chapter 5

INTEGRATING DISASTER MANAGEMENT AND POVERTY REDUCTION

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In light of the growing theoretical and policy paradigm of integrating disaster reduction and poverty alleviation efforts (World Conference on Natural Disaster Reduction Yokohama 1994; Wisner et al. 2004), China sought to blend risk and vulnerability reduction, disaster mitigation, and poverty alleviation in its short-term recovery program following the Wenchuan earthquake (Dunford and Li 2011). The task of integrating these policy goals, however, remains relatively recent, much remains to be done, and many knowledge gaps remain to be filled (Huang and Li 2012). This chapter introduces the concepts of disaster and poverty, reviews the available literature on their interaction during the Wenchuan earthquake, and recommends ways to better combine these two policy agendas, with community-based disaster management (CBDM) figuring centrally.

Disaster, Poverty, and Vulnerability

Disaster, Disaster Risk, and Disaster Risk Management

Disaster is a general term for an event that destroys people's lives and environments. Disasters can be man-made or natural, depending on the cause, whether they are geological, climate-related, environmental, or biochemical. This chapter mainly focuses on natural disasters, which are extreme events that occur in the natural environment and threaten human safety and property, including unexpected disasters (such as earthquakes, volcanic eruptions, mudslides, tsunamis, typhoons, and floods), gradual disasters (such as land subsidence, land desertification, drought, and coastal change), and environmental disasters (such as ozone depletion, water pollution, soil erosion, and acid rain caused by human activities) (China, National Validation Committee on Scientific Terminology 2007). Disasters usually threaten or damage lives, property, productive activities, and the livelihoods of exposed populations.

Moreover, their largely unpredictable nature poses a challenge for risk prevention and management.

Risk is calculated based on the expected loss associated with the occurrence of hazardous events, and it is related to the concept of incidence. Risk factors include natural disasters, social risks (crime, violence, politics, etc.), personal risks (diseases, injuries, accidents, domestic upheavals, etc.) and economic risks (unemployment, loss of assets, etc.). Current studies on the concept of risk have yielded the following conclusions: First, risk represents any possibility of negative consequences caused by uncertain factors. Second, risk can be identified, analyzed, evaluated, and prevented with modern science and technology. Third, risks in modern society include not only natural disaster risks but also man-made risks, and risk sources in modern society are more widespread and complex than they were previously. Improved understanding of disaster and risk analysis have produced a series of concepts about disaster risk management.

Disaster risk management is aimed at developing a well-rounded, sustained, multi-agent management system. This system is based on the traditional emergency management deployed during post-disaster reconstruction and pre-disaster prevention and crisis management, placing priority on results instead of actions. Research suggests that the capacity of government and society for disaster management, prevention, and mitigation can be improved using legal, political, economic, technical, educational, and engineering tools. Whole-process disaster management can also help improve capacity by identifying, estimating, and evaluating potential disaster risks.

As a result, the management of natural disasters actually involves prevention, response, and alleviation in order to protect public interest, lives, and property and ensure a normal social order and sustained development (Zhang, Okada, and Tatano 2006). This concept consists of four specific elements, including all types of natural disaster management, all phases of natural disaster management, integrated natural disaster management, and total natural disaster risk management (Okada and Amendola 2002; Okada 2003).

Poverty and Poverty Reduction Concepts

Poverty poses a problem that is both economic and social. Conceptualizations of poverty and poverty reduction vary across disciplines, illustrating the multiple facets of poverty and its implications, as well as the complexities of its reduction.

The concept of poverty has evolved, from the idea of income poverty, which is simply defined according to income and consumption; to capacity poverty, which is defined according to social factors like health and education;

to rights poverty or human poverty, which is defined according to political, psychological, and cultural factors.

Meanwhile, the measurement of poverty has expanded from merely considering absolute and short-term poverty (or temporary poverty) to including the assessment of relative poverty and long-term poverty (or persistent poverty) (Guo and Luo 2005). Recently, researchers and policymakers have increasingly adopted multidimensional and multilayer analyses of poverty in theoretical studies and policy, thereby increasing the prevalence of the multidimensional poverty paradigm. Additional concepts that have only recently emerged include knowledge poverty, information poverty, and ecological poverty (Chen 2008; Shang and Yao 2005; Wang and Alkire 2009; Hu and Tong 2010; Hu and Li 2001).

As noted in the *1997 Human Development Report* of the United Nations Development Programme (UNDP), *poverty* is not only the lack of income but also the deprivation of rights, life expectancy, knowledge, dignity, and an acceptable standard of living. Measurement methods include the human development index and the human poverty index. According to the World Bank's *2000/2001 World Development Report,* poverty includes not only material shortages but also poor health and education, vulnerability to risks, the inability to express demands, and a lack of influence in the community. The multidimensional redefinition of poverty has significant implications for poverty reduction strategies and for the selection of policy instruments.

Poverty reduction involves the use of specific policy instruments to reduce or alleviate poverty, as measured by coverage area, population size, degree, and depth. Major poverty evaluation indexes typically examine the total poor population or the poverty incidence rate.

Vulnerability among the Poor

According to the World Bank, *vulnerability* is defined as the probability of individuals or families facing certain risks and the probability of losing property or of living standards declining below the average level. This definition encompasses two dimensions of vulnerability: an external dimension, in terms of the likelihood to experience a shock, and an internal dimension, which relates to the ability to withstand the shock (Han 2004). Similarly, Chambers (1995) points out that vulnerability "has two sides: the external side of exposure to shocks, stress and risk; and the internal side of defenselessness, meaning a lack of means to cope without damaging loss."

In addition, Dercon (2001) has established an analytical framework for conceptualizing risk and vulnerability that integrates resources, income,

consumption, and relevant institutional arrangements (such as market mechanisms and public policies, etc.). In this framework, there are three risk types for farmers: asset risks (which threaten human resources, land assets, material assets, financial assets, public goods, and social assets), income risks (which threaten income creation, returns on assets, asset disposal, savings and investments, remittances, and economic opportunities), and welfare risks (which threaten nutrition, health, education, social exclusion, and ability deprivation) (Chen 2005).

Disaster impacts are not evenly distributed across affected areas. When disaster strikes, poor populations suffer more because they have greater vulnerability. People tend to seek advantages and avoid disadvantages; they may choose to live in places with a lower risk of natural disasters, for example. Therefore, people who choose to live in areas with harsh environments and frequent disasters often do so because of the economic constraints associated with poverty. Those who are able to escape poverty usually choose to relocate to safer environments, while the poorest often have little choice but to continue to reside in the most dangerous places. This pattern exemplifies the social and historical development of the relationship between disaster and vulnerability.

When disasters occur, they reveal the vulnerability profiles of poor groups, unless the disasters are not severe enough to cause major destruction. The poor have limited resources for disaster prevention, and once disaster strikes, it affects them in multiple ways. Because they are constrained by financial resources, poor people are more likely to choose residences with lower-cost building materials and design, which lower the resilience of the buildings when disaster strikes. Poor people also live in areas that often have a high population density because of land shortages. In particular, poorly planned neighborhoods with excessively crowded buildings and narrow streets are more likely to fall victim to disasters.

In terms of production, industries that mainly employ poor people are typically dependent on natural conditions and are characterized by low technology, rough tools, and inadequate protection. This means that when disasters happen, there is an additional dimension of vulnerability for poor people because of the losses associated with these means of production. Moreover, the property structure of poor people is extremely simple. Because farmers customarily put most of their savings into building their homes, the structural damage caused by disasters can lead to financial ruin. Furthermore, the productive activities of poor people are also simple because their main income

comes from traditional family farming. When disasters occur, poor farmers dependent on nature for their livelihoods are more vulnerable than those who have savings and other sources of income.

Also, after disasters occur, poor people have a weak capacity to recover and rebuild, for several reasons. First, reconstruction costs in poor areas are higher than those of non-poor areas because of the remote locations and the higher logistical costs involved. Second, certain policies are ill-suited for poor people. For instance, poor people have no choice but to give up projects with only partial subsidies because of their inability to raise money. Third, poor people bear a greater burden when they are saddled with debt.

The Relationship between Disaster and Poverty during the Wenchuan Earthquake

Given the well-established relationship between poverty and disaster, the Wenchuan earthquake understandably drew the attention of researchers, such as Dalen et al. (2012), Dunford and Li (2011), and Sun et al. (2010b), who were interested in better understanding the practical implications of the disaster for poverty in China. The literature indicates that poor households were more seriously affected (Dalen et al. 2012; Dunford and Li 2011). Dunford and Li note that the convention within the English-language post-disaster reconstruction literature (which is primarily focused on disasters in developed countries) is to measure economic costs by their absolute value and therefore to consider the costs the greatest in developed areas. Emphasizing costs as a share of overall income instead makes less-developed areas the hardest hit and the least able to recapture their previous rate of economic development.

Dalen et al. (2012) also note that poor households require longer periods to regain their pre-disaster income levels. In the case of the impacts of the Wenchuan earthquake on poverty, Dunford and Li (2011) point out that 4,834 official poverty villages required reconstruction, while additional villages became reclassified as official poverty villages (thereby increasing the number from 505 to 590 in Mianyang, and from 108 to 125 in Beichuan) as a result of the disaster. Similarly, Dalen et al. (2012) find that more households fell into poverty (according to the new 2009 poverty line of RMB 1,196 per capita net annual income) in most areas even though mean annual household income in seriously affected areas remained largely unchanged following the disaster.

Further, Dalen et al. (2012) report an increase in the number of households living below the poverty line, from 9 percent before the earthquake to 11 percent after it. They also suggest that poorer households take longer to recover, because among the households expecting to require at least five years to recover, households below the poverty line accounted for 16 percent while the lowest income group accounted for approximately 30 percent. Sun et al. (2010b) identify a similar trend, finding that the disaster also increased households' likelihood of becoming poor in the future.

Integrating Poverty Reduction into Disaster Management

In addition to surveying the impact of the Wenchuan earthquake on poverty, Dunford and Li (2011) also summarize the key poverty alleviation provisions of the earthquake reconstruction plan: the adjustment of China's general poverty alleviation policies and the State Council Leading Group Office of Poverty Alleviation and Development's (LGOPA's) earthquake reconstruction master plan, under which LGOPA targets the 4,834 official poverty villages that required reconstruction.

The LGOPA leads China's poverty alleviation policy, which is area centered and development oriented. As part of the policy, village-level investments are used to improve (1) village infrastructure, services, and productivity; (2) agricultural production and downstream value-added activities; (3) labor training and labor transfer policies; and (4) special categories of areas. These measures remain relevant for the earthquake zone but are specially adjusted there. In particular, following the 2008 revision of the strategy, the poverty standard and minimum allowance were both updated, with the new standard coming into effect as early as 2009 (Dunford and Li 2011).

Reinforcing these efforts, the LGOPA also adopted and implemented an earthquake reconstruction master plan for the 4,834 poverty villages, which were estimated to have required an average restoration and reconstruction cost per village of RMB 3.25 million (China, LGOPA 2009). Dunford and Li (2011) note that there were several sources of this money, including the Central Post–Wenchuan Earthquake Restoration and Reconstruction Fund, government poverty reduction funds, donations, and loans. Nevertheless, as the government funds, which were primarily dedicated to infrastructure, production recovery, capability enhancement, environmental improvement, and unforeseen costs, did not reach the estimated per-village funding requirement, only some of the projects were implemented. As Dunford and Li point out,

analysis of this investment further reveals that the emphasis in the reconstruction on areas that suffered greater damage resulted in a lack of emphasis on poor villages.

In the most severely affected areas in Sichuan, poor counties designated to receive aid from provincial-level offices (the latter working in partnership with state-owned enterprises), received approximately one-half as much special central and local government funds as non-poor counties and one-third as much partnership funds as non-poor counties (because of the amount of damage suffered) (China, LGOPA 2009). However, poor counties did receive aid from nongovernmental sources. Given the concentration of government resources in the most seriously affected areas, domestic and international donations and aid were dedicated to less seriously affected areas. Poor villages in poor counties (which, as far as government funds are concerned, are designated to receive aid from both provincial-level and national-level offices) received more than 90 percent of this nongovernmental type of support.

As for the effectiveness of these interventions, Dunford and Li (2011) acknowledge that the integration of risk reduction and poverty alleviation into short-term post-disaster recovery succeeded. They recommend that the shortened two-year reconstruction program be extended and developed into a new program of medium-term economic development and poverty alleviation that uses enhanced production methods to improve village farming productivity and income. Village farming would involve the production of higher value-added products and the creation of alternative employment in downstream activities in rural and urban areas.

As part of its large-scale project on the poverty dimensions of the Wenchuan earthquake, the International Poverty Reduction Center in China offers a broad array of macro and micro recommendations for integrating China's poverty reduction and disaster management policies. The full range of recommendations spans various issues such as improving the integration of NGOs into disaster work and poverty reduction work (Li and Huang 2012); promoting environmentally sustainable reconstruction (Huang and Xiang 2012); and clarifying and improving the division of labor among various levels of government. But the key recommended policies include improving, expanding, and integrating social safety nets and strengthening community disaster management capacity. In particular, the Center explains that capacity building will require improving awareness of disaster prevention and mitigation, increasing local knowledge of disaster management techniques, and establishing an emergency response system at all village levels.

Recommendations for Deepening the Integration of Poverty Alleviation and Disaster Management

Given this rich discourse and supportive context, China's 2011 National Comprehensive Disaster Prevention and Reduction Plan (2011–2015), which calls for the integration of disaster management and economic and poverty alleviation plans by the end of 2015, is especially encouraging (Jiang 2013). In the plan, well-defined disaster prevention and reduction goals, tasks, and major projects are put forth to build China's capacity for comprehensive disaster prevention and reduction and to promote sustainable economic and social development.

In order to meet these and other goals, 10 specific capacity-building tasks are identified in the plan. These tasks include natural disaster monitoring and early warning, risk management, civil engineering measures, community disaster reduction, emergency response, recovery and reconstruction, technology empowerment, and social mobilization. In particular, community-based disaster management (CBDM) approaches, which develop locally owned and locally appropriate strategies for disaster preparedness and risk reduction, are frequently cited as key to the integration of poverty alleviation and disaster management (De Silva and Burton 2008; Yodmani 2001; Schmidt, Bloemertz, and Macamo 2005). Recent projects dedicated to CBDM—such as the UNDP and Department for International Development (DFID) trilateral project, Sharing and Learning on Community-Based Disaster Management in Asia, which aims to reduce poverty by improving community resilience to disasters—additionally underscore the centrality of this strategy for alleviating poverty while also reducing disaster risk.

Zhang, Yi, and Zhao (2013) review China's recent progress in CBDM development and highlight key remaining challenges. They explain the recent development of the CBDM concept and China's implementation of capacity-building activities. These capacity-building activities involve constructing "national safe communities" in which people can safely live, work, and play (Wu and Zhou 2005), by means of setting relevant community safety standards and establishing a community safety assessment system. In addition, a comprehensive disaster reduction community assessment system has been set up to guide local governments and community managers in their risk mitigation planning and emergency preparedness, response, and recovery efforts, with communities that achieve scores of at least 60 points (out of a possible 100) becoming candidates for a special "comprehensive disaster reduction demonstration community" designation.

Zhang, Yi, and Zhao (2013) note that CBDM development requires the enhancement of relevant policies and laws in China, including the Opinions of the State Council on Strengthening and Improving Community Service Work (which mandated that governments establish disaster and accident emergency response mechanisms and enhance communities' emergency and incident response capacity), the Opinions of the State Council on Comprehensive Strengthening Emergency Response Management Work (which proposed that communities should develop and popularize effective emergency response plans), the 11th Five-Year Plan on Comprehensive Disaster Reduction: 2006–2010 (which called for the strengthening of urban and rural community disaster reduction capacity building and community disaster reduction capacity building demonstration programs), the Standards on National Comprehensive Disaster Reduction Demonstration Communities (2007) (updated in 2010, standards that provide the most comprehensive CBDM policy guidance in China), the Opinions on Strengthening Building Grassroots Emergency Response Task Forces (which provided guidance on the establishment, management, and support of grassroots emergency response teams), and the State 12th Five-Year Plan on Comprehensive Disaster Reduction: 2011–2015 (which called for the enhancement of communities' comprehensive disaster prevention and reduction capacity and growth in the number of national comprehensive disaster reduction demonstration communities). All these efforts related to CBDM were the result of recent domestic emergencies and disasters (the 1998 flood, SARS in 2003, and so on), as well as international disaster reduction activities, such as the International Decade for Natural Disaster Reduction and the 1994 World Conference on Natural Disaster Reduction. They also note that despite these encouraging signs of progress, China's nascent CBDM implementation still faces challenges. These challenges include developing China's CDBM-related organizations and coordinating mechanisms, boosting low levels of participation by community residents, refining disaster risk assessment methods, promoting NGO development, and spreading safety-oriented ideas and values.

Enhancing individual participation in CBDM activities. Zhang, Yi, and Zhao (2013) call attention to inadequate participation by individuals in CBDM in China. They note that outside experts generally operate the comprehensive disaster reduction demonstration community construction projects and the national safe-community construction projects, while the government generally performs the assessments and examinations of these projects. Not only are many community members not involved in their local

disaster prevention and reduction activities, but they are usually unaware of what type of disaster prevention and reduction activities are carried out in their communities.

This situation is unfortunate, Zhang, Yi, and Zhao (2013) explain, because individual participation in the management process is essential to the success of community-based disaster reduction activities. Such participation develops when community residents are allowed to participate in the management process. Abarquez and Murshed (2004) explain that community members must acquire a comprehensive understanding of the relevant hazards and disaster risk levels and must support hazard elimination and risk mitigation activities. Improving individuals' understanding of community disaster response plans and their personal roles in the plan will help to reduce casualties and property loss (Zhang, Yi, and Zhao 2013). Ultimately, Zhang, Yi, and Zhao (2013) recommend measures to guide individuals to participate in community management.

Enhancing CBDM organizations and coordination mechanisms. Zhang, Yi, and Zhao (2013) explain that in addition to the five standard administrative levels of the Chinese government (province, prefecture, county, township, and village), there is also another level, known as the "natural village." Unlike the five standard levels, the natural village is not defined by any official administrative division—a village in the administrative sense can contain anywhere from two to dozens of natural villages. Although most services such as healthcare, education, emergency management, and economic development are delivered at the county level, the natural village is the ideal unit for the creation of CBDM activities that enable communities to undertake self-help and mutual-help activities immediately in the event of a disaster.

Community-level volunteer disaster management organizations must be established (Gaillard 2010), and the government must provide these organizations with timely and accurate information on hazard risks and mitigation measures. This will ensure that the community's disaster management organizations are sufficiently aware of and prepared for key disaster risks (Sims and Baumann 1983).

Zhang, Yi, and Zhao (2013) explain that despite the introduction of some public sector–led CBDM pilot programs in China, the gains from and potential for these programs are severely constrained by the current lack of legislation, funding, and implementation mechanisms. These authors also note the small share of NGOs within the nascent NGO community in China that are dedicated either to disaster prevention (that is, avoiding a disaster) or to risk reduction (limiting the damage caused by a disaster)—fewer than 1 in 1,000

NGOs in China are devoted to such work. Given the potential role NGOs can play to support CBDM, these facts call for the development of CBDM-related NGOs as well.

Zhang, Yi, and Zhao (2013) highlight two key strategies for advancing this agenda: (1) the creation of a favorable social environment by the government through the refinement of laws and regulations related to NGOs and (2) the outsourcing of services to NGOs.

Refining community-based disaster risk assessment methods. Although China's governments have promoted CBDM at all levels, the implementation of China's CBDM remains preliminary for two reasons: depth of guidelines and scale of assessment (Zhang, Yi, and Zhao 2013). Regarding guideline depth, the National Committee for Disaster Reduction's *Standards on National Comprehensive Disaster Reduction Demonstration Communities (2010)* includes an innovative attempt at creating a community-level disaster management assessment system and a scoring system to determine candidacy for comprehensive disaster reduction demonstration community designation. Nevertheless, the *Standards* covers only "what to do" and neglects to explain "how to do it."

Regarding the scale of assessment, current community methods for disaster risk assessment are configured at the regional scale (Birkmann 2006; King and Macgregor 2000), but the assessment methods should instead be defined on the smaller scale at which the community acts when disasters occur (Dwyer et al. 2004; Medina-Vera et al. 2010; Barzyk et al. 2010).

Conclusion

Before the Wenchuan earthquake, China's government responded to disasters with little regard for the distinctions between different groups' recovery experiences. After the earthquake, however, the government realized that, in the face of disasters, people with different conditions have different recovery periods and requirements, and that this is especially true for poverty-stricken populations. As a result, the idea of integrating disaster management and poverty reduction was born.

Unfortunately, translating policy into practice involved confronting several obstacles, such as the shortsightedness of the integration. Moving forward, the integration of poverty reduction and disaster management could involve natural disaster monitoring and early warning, risk management, civil engineering measures, community disaster reduction, emergency response, recovery and reconstruction, technology empowerment, and social mobilization.