

SHUYU JIANG

Displacement and Resettlement Following the Ludian Earthquake in China

While the memory of the Wenchuan earthquake is vivid in Chinese people's memory, on 3 August 2014, a 6.5-magnitude earthquake devastated Ludian County in Yunnan Province in southwest China. According to the central government's calculation (Government of the PRC, November 2014), 617 people were reported dead, 112 missing and 318,000 people were displaced. The earthquake was the largest natural disaster in China in 2014 and caused economic losses amounting to US\$6 billion (ESCAP, 2014).

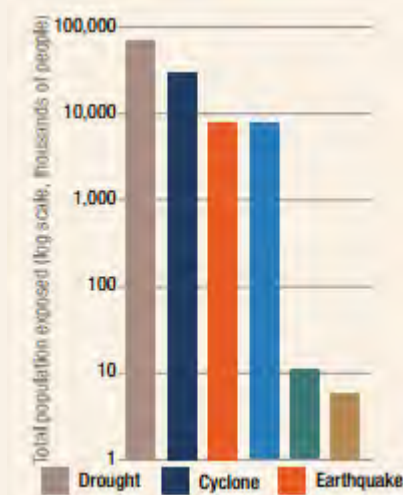
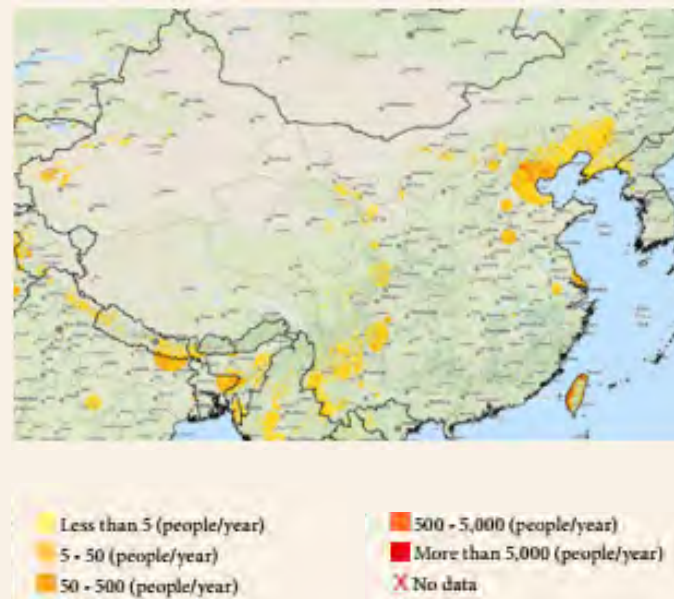
This paper concentrates on displacement after the Ludian earthquake and the relevant solutions to it. The first part provides the background information as to why this area is vulnerable to natural disasters. The second reviews the impacts of the earthquake and how rescue and temporary migration were subsequently implemented. After analysing the short-term action, the third part focuses on long-term resettlement and rehabilitation in order to explore feasible solutions to different flows of migrants in the longer term.

The paper notably establishes connections between environmental and economic factors before and after the migration process. On the one hand, an extensive thriving economy would exacerbate environmental risks, thus inducing more natural disasters and migration problems. On the other hand, given existing problems, environmental migration could represent a proactive solution for this underdeveloped area to obviate the vicious circle regarding its development and accelerate economic growth.

1. BACKGROUND INFORMATION

1.1. Country Profile – China

As shown in Figure 1, China is prone to droughts, floods, cyclones, earthquakes and various other types of natural disasters. Droughts are the most influential natural disaster and almost 100 million people are under threat from it. Next come cyclones, which mainly affect coastal areas, and then earthquakes and floods, which also touch about 10 million people. More seriously, rapid economic development and an expanding population bring about more environmental problems. All these factors aggravate the frequency of natural disasters and the subsequent difficulties regarding resettlement. It is estimated that “since 2008, China has experienced three disasters in which more than 3 million people were displaced, five disasters that 1 to 3 million people were displaced” (Lavell & Ginnetti, 2014).

Figure 1. Absolute population exposure to hazards: China (Lavell & Ginnetti, 2014)**Figure 2. Population exposed to earthquakes in China (Lavell & Ginnetti, 2014)**

source: UNEP/GRID-Geneva PREVIEW

Even though earthquakes threaten fewer people than droughts or cyclones, their impact should not be underestimated. China is vulnerable to earthquakes because it is located in both the circum-Pacific seismic belt and the Alpine-Himalayan orogenic belt. The deformation between the Pacific plate, the Indian plate and the Philippine plate jointly influence China's tectonic features. The complexity of its tectonic makeup therefore results in the significant density, high frequency and wide range of earthquakes in China: "In all the continental areas around the world, about 1/4 to 1/3 big earthquakes took place in China in the 20th century" (China Earthquake Administration, 2013).

A further observation regarding the regions which are frequently affected by earthquake (Figure 2) displays another difficulty in risk reduction. Besides the area around Beijing and Bohai Sea in north China, people in the middle and western part of Mainland China are more exposed to earthquakes. Meanwhile, the social and economic development of this area lags behind that of the coastal area, hence funding and resources for risk reduction in the area are limited. This also adds to the difficulty in resettlement and rehabilitation after hazards and potentially hinders further development of these areas.

1.2. Ludian County as a vulnerable area

Like many other areas in western China, this area is prone to natural disasters as a result of its natural conditions, as well as the absence of a sustainable and concrete development plan.

First of all, Ludian County suffers from harsh natural conditions. Located in a fault zone, the area is frequently affected by earthquakes. "Since 1900, there have been 15 earthquakes with a magnitude higher than level 6 in this area" (Government

of the PRC, November 2014), The geological configuration is complex in this mountainous area with precipitous slopes, deep canyons and fragmented stratum. Moreover, its changeable climate results in many natural disasters. In dry seasons, people must rely on cisterns for their daily provision of water. Yet it so happened that the earthquake occurred during the rainy season in the basin of the Jinsha River so there is a high possibility of a series of secondary disasters in the wake of the earthquake. It has allegedly been reported that compared with the earthquake itself, more people died as a result of landslide, rocks, as well as flows of debris.

Moreover, the unfavourable natural conditions impede economic development in this area. Yet, tough as the conditions are, agricultural productivity is low in this county. Regarding industrial development, the inauspicious natural conditions pose a threat to development, which requires strategic planning to minimise environmental impacts. However, in reality, overpopulation and overexploitation have contributed to serious soil-erosion, which has worsened environment problems. Firstly, an important source of economic revenues is the quarrying industry, and while this industry expands without sound regulation, it will inevitably have negative consequences for the environment. Secondly, the population density is 277 people per square kilometre (Ludan County Government, 2014), which is twice the average density in Yunnan Province. As the population has already exceeded the ecological carrying capacity, management alone cannot solve all environmental problems.

This area suffers from poverty. In the city of Zhaotong, "Within 11 districts and counties in this city, 10 are recognised as extremely poor based on national standards" (Bai Wenxue, 2014). In Longtoushan Town, which is the settlement most seriously effected by the disaster, "there are 51214 people, of which 6910 people are under poverty, 2650 people are under extreme poverty, 4360 are with low incomes" (Ludan County Government, 2014). The city cannot thus be expected to solve all of its development problems itself, as in a state of poverty, expenditure on more resilient infrastructure and other risk reduction measure is limited. For instance, most houses here are made from wood or adobe, which cannot resist strong earthquakes.

Consequently, impoverished areas are more exposed to disasters and disasters exacerbate poverty. The economic development of Ludian County thus falls into a vicious circle: the underdeveloped economic and environmental conditions hamper development so that accessible water power and mineral resources are particularly important for economic growth, yet the reliance on these recourses potentially destroys the environment.

1.3 Absence of pre-existing disaster reduction measures

A UN ESCAP disaster review warned of the potential danger of "slow-onset disasters", which are "less visible, as they are spread over time with multi-sectoral impacts" (UN ESCAP 2014). Such disasters constitute a major problem in this area, where stony desertification is gradually undermining livelihoods and threatening the safety of the population. The problem is accentuated by the lack of risk reduction measures on the one hand, and by the impracticability of conventional measures (such as consolidating houses or improving living conditions) on the other hand; migration could thus be a more realistic option.

Figure 3 indicates two major problems in this affected area. Firstly, there is little coverage of forest to alleviate the negative consequence caused by overexploitation, and secondly, the absence of roads, railroads and other basic infrastructure would hinder any attempted rescue following the occurrence of a natural disaster.

Certain funding has been devoted to both environmental management and migration. Ludian county launched a comprehensive management scheme concerning stony desertification from 2008 to 2013, "277.96 square kilometers of karst areas have been managed, which accounts for 34.5% of the total area"(Junyi Chen, 2013). As the project is particularly costly and time-consuming, progress has been relatively

slow. Moreover, in 2012 in Ludian County, 60 households migrated to other places as a result of the fragile ecological environment and poverty and 1.5 million Yuan has been devoted to this project (Yanquan, 2013). By way of comparison, in Qiaojia County in Zhaotong, 600 people benefited from this policy and 10 million Yuan was allocated in the same year (Yanquan, 2013).

At the provincial level, in 2014 the Yunnan government started to rebuild houses in rural areas and began resettlement. However a mere 24.14% of programmes have been started and only 13.79% of them have been finished in Ludian County (Junli Zeng, Yongqin Yang, 2015). Consequently, poor disaster mitigation and the reluctance of environment migrants represent other underlying causes of the large casualties and economic losses provoked by the earthquake.

2. RESCUE AND EVACUATION AFTER THE EARTHQUAKE

2.1 Impacts of the earthquake

The intensity of the earthquake was high (Figure 5), reaching level IX¹ in intensity at its epicentre in Ludian County. Qiaojia County and Huize County were also seriously affected, and the earthquake also had an impact on Guizhou and Sichuan Provinces, and, reportedly “in 10350 square kilometers of areas, the intensity exceeded level VI” (People’s Daily, August 2014). According to the data updated on the 4th August by the International Federation of the Red Cross (Figure 4), the earthquake has already resulted in 398 deaths, with a great deal of destruction, most of which was in Ludian County.

Figure 4. Death toll after the earthquake

Prefecture	country/District	Death	Missing	Injured
Zhaotong	Ludian	319	0	
	Qiaojia	55	0	
	Zhaoyang	1	0	
Qujin	Huize	122	3	
	Total	398	3	1,801

Source: IFRC, August 2014

As discussed above, the fragile ecological environment in the affected area also contributed to many secondary disasters. A barrier lake was formed when the river was blocked by huge landslides caused by the earthquake, and the rising water level submerged the village in that area, which would have greatly endangered the lives of the 800 inhabitants had they not been evacuated beforehand (Earthquake Report, August 2014).

Besides huge casualties, another feature of the earthquake was the tremendous damage to infrastructure: large amounts of basic infrastructure were destroyed, sealing off the affected area. Up to the 20th of August 16,158 machines and 8,951 personnel were involved in restoring transportation links, water supply, and electricity and telecommunications (Yan Wang, August, 2015).

1. In China, the intensity of an earthquake is measured from level 1 (weakest) to 12 (strongest). Signs of destruction of buildings occur when the level is higher than 6 (Author’s note).

On the 4th August, the first dispatch of resources was sent to victims. However, floods, aftershocks and many other secondary disasters further debilitated the state of the already fragile infrastructure. Many repaired roads were damaged afresh, thus preventing other rescue forces and resources from entering the disaster area. Some resources were transported through aerial delivery by helicopters, and others were delivered by the army.

2.2 Organisation of the rescue process after the Ludian earthquake

At the central level, the Chinese government has established an overarching legal framework and coordinated work at different levels regarding the disaster response system: the “Law of the People’s Republic of China on Protecting Against and Mitigating Earthquake Disasters” was passed in 1997. It covers monitoring, protection against potential hazards, as well as emergencies and reconstruction after an earthquake. In 2012, the Chinese government enacted the “National Earthquake Emergency Response Plan”, which is composed of a hierarchical system, from level I(highest) to IV (lowest). The level can be upgraded to a higher level if an earthquake strikes a border area, an area inhabited by ethnic minorities and other particular areas.

Figure 6. Response levels of the National Earthquake Emergency Response Plan

Level	Standards	Major Participants (From central to local level)
I	Death toll (including missing) > 300; Direct economic loss > 1% of the total GDP in the affected area last years; Magnitude > 7.0 (or >6.0 in densely populated areas)	State Council (Guiding rescue and coordinating assistance nationally) Commanding Headquarter in response to disasters in the provincial level (Leading emergent response in the affected area)
II	Death toll (including missing) 50-300; Magnitude 6.0-7.0 (or 5.0-6.0 in densely populated areas)	State Council (When necessary); Provincial commanding headquarter in response to disasters
III	Death toll (including missing) 10-50; Magnitude 5.0-6.0 (or 4.0-5.0 in densely populated)	Municipal commanding Headquarter in response to disasters with the support from the provincial level
IV	Death toll (including missing) < 10; Magnitude 4.0-5.0	County commanding headquarter in response to disasters with the support from the provincial and municipal level

Source: Author’s summary based on the National Earthquake Emergency Response Plan

This kind of top-down approach is widely adopted in risk reduction and regarding emergencies, and the case of the Ludian earthquake was no exception. Each level provides for a division of tasks and typically every bureau has a corresponding office at the local level. After the Ludian earthquake, a level I emergency response was launched. The China Earthquake Administration organised a team composed of six working groups: disaster monitoring and forecast; investigation and inspection of disasters; media coverage; comprehensive management; scientific support and logistical support (Shifang He et al, 2014). In addition, as stipulated in the law, “the Chinese People’s Liberation Army, the Chinese People’s Armed Police Forces and the People’s Militia shall carry out the tasks of protecting against and mitigating earthquake disasters” (Government of the PRC, 1998). As such, rescue teams were deployed to the area immediately after the earthquake — “One minute after the disasters, 115 soldiers in the emergency rescue team have been deployed to the area and 5 hours after the earthquake, the first rescue resources have arrived” (Junli Zeng, Yongqin Yang, 2015). In addition to the central government working group, the earthquake administration

Figure 5. Impacts of the earthquake



Source: Government of the PRC, November 2014

in Yunnan Province also dispatched a 30-member working team to the county to assist with and implement orders from the central government (IFRC, August 2014).

While the various levels of government institutions have played a leading role in the rescue process, the role of non-governmental actors should not be neglected. Due to the deployment of the Ministry of Civil Affairs, many social workers arrived in the disaster areas and assisted the rescue effort. They mainly interacted with those people who were displaced, particularly assisting victims who lost relatives. Their contribution compensated for the absence of basic community services and organisation after the evacuation.

To improve the organisation of the relief effort, the “National Earthquake Emergency Response Plan” also includes social mobilisation as an effective approach after an earthquake. It requires the local headquarters to identify specific organisations and personnel to regulate the voluntary work, and to publish information about the needs of the disaster area to ensure the safety and efficient organisation of all volunteers. This combination of government resolution backed up by participative social organisation has become an emerging trend in China and the discussion below will further elaborate on this phenomenon.

2.3 Emergent resettlement

Temporary resettlement is mainly organised in two ways: collective resettlement and voluntary migration. According to Article 35 of the “Law of the People’s Republic of China on Protecting Against and Mitigating Earthquake Disasters”, concerning post-earthquake relief and reconstruction, the Ministry of Civil Affairs is primarily in charge of the arrangement and resettlement of victims, including the establishment of temporary shelters, the provision of daily necessities, and so on. Considering the difficulty of resettling such a huge population, victims are also encouraged to voluntarily move to other places and live with their relatives. Up to the 15th August, 342 collective resettlement shelters had been established, about 126,600 people had been resettled collectively and 113,100 people had been resettled separately (Bureau of Civil Affairs in Yunnan Province, August 2014).

2.3.1. Temporary settlement in centrally located camps

In the temporary camps, there are centralised provisions of food, water and other daily necessities. People living in temporary camps receive benefits for daily life—“every citizen could obtain 25 Yuan every day during an emergency resettlement period of 10 days. Then in the interim period of three months, everyone could obtain 15 Yuan per day” (Bureau of Civil Affairs in Yunnan Province, August 2014).

Several departments are jointly in charge of the well being of victims. When selecting the locations for resettlement, the Ministry of Land and Resources undertook a scientific examination and evaluation to rule out geological threats. In these shelters, local centres for disease control conducted disinfection and supervised epidemic diseases. As for basic social services, medical centres, epidemic prevention centres, fire-fighting points and public security regulations were established to minimise risks within a clustered population.

2.3.2. Self-organised resettlement

Alternatively, a large number of victims chose to seek assistances from their relatives and migrated to other areas by themselves. Like most underdeveloped areas in China, many young people in Ludian County have already left their hometown to become migrant workers in cities. In 2010, the whole county had exported 114, 300 migrant workers (Hongxin Nian, 2014). Elderly people and children thus comprised the majority of the population in the county. After the earthquake, they had the option to move with young workers to cities. A major problem of this type of resettlement lies in the Hukou System in China: in China, everyone is officially registered

in one place and the social well-being is associated with the location of the Hukou. As Hukou in cities are difficult to acquire, the subsequent problem is the issue of how these victims can gain access to social welfare if they move.

2.3.3. Involvement of civil society

Notably, the aftermath of the earthquake was the first time that the Chinese Ministry of Civil Affairs devised a social work service assistance plan. Five social service teams were deployed to the collective resettlement tents and schools from Beijing, Shanghai, Guangdong, Sichuan and other Provinces at the end of August. Under the coordination of the social service centre for the Ludian Earthquake, these social service teams directly assisted corresponding social service centres and focused on establishing local social organisation in the resettlement area.

Once the social service team had concluded their mission after three months, a considerable proportion of the volunteers continued to participate in the resettlement process. In one of the resettlement spots, “Huijiezi”, volunteers were expected to live with migrants for one year. Their daily job mainly included providing resources and offering psychological counselling after the crisis. Compared with disaster rescue in the immediate aftermath of the earthquake, this long-term voluntary work is more targeted at the needs of the local society and improving the efficiency of the whole migration process.

A wider range of civil society engagement facilitated the resettlement process. Firstly, many services had not been fully rehabilitated in the face of increasing demand for them after the disaster. Secondly, it improved the efficiency of assistance from other provinces because participation at the grassroots level can better target the needs of displaced people. For instance, volunteers organised recreational activities to accelerate the rehabilitation and integration of local communities. Lastly, they shared experiences and best practices about social services and voluntary participation, which have not previously been popularised in this underdeveloped area. Such activity further cultivates local voluntary organisations and volunteers, which could constitute the backbone of the future development of local civil society.

3. FROM TEMPORARY EVACUATION TO STABLE RESETTLEMENT

Given that more than 300,000 people were displaced after the earthquake, a serious question was posed regarding how these migrants would resettle in the longer term. An overarching objective was established on the national level: within three years, basic living conditions and social-economic development should have returned to or exceeded levels in the region prior to the earthquake.

Compared with post-disaster temporary migration, long-term rehabilitation not only involves resettlement of victims, but also their integration into new communities and the cultivation of their self-sufficiency.

3.1. National planning and policies on rehabilitation

Three months after the earthquake, the State Council published an overall plan about the reconstruction and rehabilitation following the earthquake. It contains some similarities to the ongoing resettlement process. The plan also emphasised a combination of decentralised and centralised settlement, and mobilizes other viable social resources to ease the financial burden.

Aside from the common feature of flexibility, it blueprinted a more specific resettlement plan, summarising forms of resettlement into 3 categories:

- A. Decentralised settlement: those residents who still have contracted land could voluntarily build their houses under the guidance of an overarching planning authority. Farmers who formerly lived in areas with high geological hazards

- should also be migrated to a safer area and resettled in a dispersive way;
- B. Centralised settlement: designed for the farmers who lost their contracted land. In the event of sufficient, people would also be resettled in order to avoid geological hazards.
 - C. Monetary compensation: distributed to those farmers who have migrated to work in cities whose houses were damaged in the earthquake. Moreover, subsidies were also offered to those who wished to buy houses in cities.

The plan also introduces a new spatial arrangement for the resettlement, composed of three parts:

- A. Restoration in original zones, mainly comprising the valley plain where the natural environment is secure and economic conditions are sound. This area has mainly attracted migration inflows from the severely affected areas;
- B. Reconstruction near the original zones. This area has also been designed for inflows of migrants from the old town in Ludian County and the displacement caused by landslides and flooding;
- C. Zones under comprehensive management. These places are in danger of destruction, mainly because of geological hazards. The process requires the improvement of ecological resilience so unlike the two previous categories, it is the major area in which migration outflows have occurred.

3.2. Flows of migrants following the evacuation

Combined with the above spatial arrangement and trends, major flows of displaced people can generally be divided into the following groups: A. returnees; B. migrants to nearby areas; C. potential environmental migrants to other areas. This paper will analyse these three types of migrants in turn to identify their current situation and the problems facing them.

- A. **Returnees:** Due to cultural and social reasons, most migrants are reluctant to move great distances to different parts of China, a fact that is magnified considering that many victims are elderly people. Traditional Chinese people value places where they have lived for generations, hence reconstruction of original sites is frequently the preferred option. After returning, these people usually resettle in a decentralised fashion. Although a considerable number of people decided to return, the chronic problems have not been solved. As mentioned above, this area is exposed to numerous natural hazards, and given the poor economic conditions, farmers are unable to rebuild houses in a manner which makes them resilient to natural disasters. Moreover, difficulties in the restoration of basic infrastructure may hamper the restoration of economy. As a result, the whole restoration process is blighted by uncertainty and proved extremely costly.
- B. **Migrants to nearby areas:** Due to the severity of the earthquake, in the inhabitants of the most severely affected areas cannot return. It is thus imperative that they migrate to another area. One frequently adopted option was to set up resettlement points near to the original location. In order to ensure the efficient and scientific selection of a new site, this category of migrants have mainly resettled in centralised settlements. One of the representative areas is Longtoushan Town, where the severity of the earthquake was most pronounced; almost the entire town was destroyed by the earthquake. On top of that, the population in the old town had already exceeded the ecological carrying capacity, meaning that rebuilding the original site was not a rational option. Consequently, a new settlement site was selected near the area called “Luoyingkou-yingpan” district. This settlement is a site of about 200 hectares (Government of the PRC, November 2014) to house migrants from the old town.
- C. **Potential environment migrants to other areas:** the national plan also identified zones under comprehensive management, where people exposed to high

natural risks should migrate to other places. There had not been any concrete plan regarding this flow of migrants up until this point. Nonetheless, it marks a transition from passive disaster response to a more proactive means of addressing disaster mitigation and preventive efforts.

4. THE EXISTING SITUATION AND DIFFICULTIES OF MIGRATION IN THE LONG TERM

Unlike traditional migration, resettlement after disasters such as earthquakes involves more difficulties.

Typically, in the categories of environmental migration for the purpose of project construction or ecological protection, ex-ante research of the feasibility is carried out, both a well-organised plan for the whole process and a socio-economic survey regarding the willingness of migrants are drawn up, and compensation is attributed to migrants before implementation. In contrast, disaster-induced migration requires an instant response as soon as possible. Meanwhile, with the losses of homes or even relatives, migrants have to endure huge psychological pressure.

The difficulties and possible policy operations vary according to different target groups. The following section will examine the challenges faced by different flows of displaced people and how they attempt to recover from the effects of the earthquake.

4.1. Willingness to move

In the affected area previous migration has mainly been driven by economic factors. Young people move to cities in search of better job opportunities, with their family members (mainly children and elderly people) remaining in the county. Migrant workers save and send back much of their income to support their family in the counties. However, migrants driven by other factors, such as environmental migration, are less welcomed by the local people even though in many cases the areas that the migrants left are no longer suitable for life. The previous section highlighted the cultural factors in this problem. In fact, even though there are currently no accurate official data regarding migrant flows, it can be deduced from media coverage and previous experience that most people returned to their area of origin or somewhere nearby. In 2015, the expected target was to establish 46 settlements, 139 educational programmes and 28 sanitation programmes (Houyou Cai and Xunshen, 2015). Among these settlements, more than half of the sites were in Ludian County: 24 in Ludian County, 10 in Qiaojia County and 12 in Zhaoyang District in Zhaotong (Bureau of Housing and Urban-Rural Development of the PRC). As shown in the Figure 5, all of these settlements are located near the earthquake's epicentre.

4.2. Restoration of the economy

Given that willingness to move is limited, many residents relocate in or near to the original area. Recovery of the economy is a central element in the rehabilitation of these areas. In order to facilitate it, the first step that must be taken in affected areas is to recover agricultural production by supporting traditional agriculture in the area. For instance, cultivation of pepper is the major source of income for many farmers but many mature peppers could not be harvested in time after the earthquake. Additionally, 20,000 mu² of pepper land was destroyed, 160,000 mu was partially destroyed and 30,000 mu were slightly damaged (Ministry of Agriculture of the PRC, 2014). The Ministry of Agriculture organised purchasers for the affected areas and

2. Mu is the measurement in China. 1 mu is equal to 666.67 square meters. Author's explanation.

promoted direct marketing channels with local farmers. It also organised online sales so that companies in other provinces could purchase peppers.

Nevertheless, rehabilitation near the original area may not be a sustainable solution. On the macro level, following the disaster, 322 geological hazard points were found, of which 139 are new (Yanling Liu, August 2014). This underlines the fact that previous environmental risks still exist. On the micro level, the income of most victims mainly comes from agriculture, thus people's loss of land as a result of the earthquake raises the question of the adaptation to the economic structure in the places to which they have been relocated because of their lack of skills.

4.3. Reconstruction of houses

While the central government established a framework for resettlement after the earthquake, the local government dealt with the details and the implementation of the rehabilitation process. A central aspect of rehabilitation is fund raising for rebuilding houses in the new settlement site. According to the national plan, subsidies were allocated for the reconstruction of houses by victims. The standard sum was 40,000 Yuan per household for reconstruction of a house with an additional 10,000 Yuan for impoverished households (Yongfeng Zhao, 2014). Moreover, the local government designated a centralised management system, according to which residents' houses were rebuilt communally with funding managed collectively.

At the local level, a series of rules³ were proclaimed. Firstly, residents had to submit an application to the neighbourhood committee ("Juweihui", a self-governance entity in China based on people living in nearby areas). After approval by the leader of the committee, the neighbourhood committee must report the fact to the government of Ludian County and sign a contract with the resident.

Secondly, funding is composed of two elements: A. A public payment: a special subsidy for rebuilding houses in the collective resettlement areas which is allocated by the municipal authorities. The residents are required to submit a "power of attorney for the payment". After examination of the submission, the money is directly paid for units of construction during each phase of the construction. B. Money contributed by residents: in the event that these special subsidies are not sufficient, residents are required to collect the remaining funding themselves and pay it to the county government. Both of these lines of funding are eventually allocated to a special account by the office of finance in the county. To make the process more transparent, a supervision group, which includes residents, monitors the whole process of management, utilisation of funding, as well as the quality of the houses. This combination of public and self-raised money helps to significantly alleviate the burden of a county, which has to deal with extreme poverty.

4.4. Selection of the new site

While resettlement near the area of origin may not be a long-lasting solution, migration to other places may also prove difficult. First and foremost, Yunnan Province is home to a broad range of ethnic minorities, meaning that resettlement must take the habits of ethnic minorities into consideration. Fourteen different ethnic minorities live in Ludian County, the largest proportion of which are Hui (16.6%) (Ludian County Government, 2014). Prior to the earthquake the same minority groups lived in close proximity to but separately from each other because of the inconvenience of transportation in the mountainous area. They thus developed their respective individual cultural atmospheres and lifestyles. Consequently, it is better that the relocated area has a similar

3. For details, see: Ludian County Government: Management of funding for rebuilding houses in settlements in Ludian County. 2015. http://www.ludian.gov.cn/defo_Show.asp?Infold=2256&ClassId=54&Topid=31. Accessed: 15th April, 2015.

social and economic structure. Additionally, the low transferability of skills also makes it difficult for most farmers to integrate in new economic and social conditions.

Besides the issues concerning those people to be relocated, problems focusing on the host communities should also be recognised. Counties with newly established settlements were already densely populated and had exceeded their ecological capacity. An influx of migrants thus puts additional strain on the environment, increasing environmental pressure in the area. Thus, if the capacity of the new host community is not carefully evaluated, relocation is merely a transfer of problem from one region to another, perpetuating the vicious circle.

Meanwhile, the possibility of relocating the people displaced by the earthquake to more developed areas in the west of China is also unlikely. In addition to transportation costs, there are evident differences in lifestyle, culture and many other social factors. Indeed, the inequality of development among the different regions in China makes the selection of relocation sites problematic.

5. CONCLUSION

Migration in the wake of the earthquake is not merely a passive response to the disaster. On the one hand, if migration is associated with the transition of livelihoods and progress towards poverty reduction, victims could overcome the limitations imposed by environmental conditions. If migration policy helps to reduce the pressure that human activities put on the environment, the recovery process in ecologically fragile zones will be more effective.

As a consequence, the transition from relying on outside assistance to self-sufficiency is a key issue in the long term. As Balakrishnan Rajagopal contends, developmental displacement should include “rights to life and livelihood” (in McDowell Gareth Morrell, 2010). This right requires “adequate standards of living for the whole family”, as well as protection of “the sustainability of the local environment” (in McDowell Gareth Morrell, 2010).

After the restoration of farmland and equipment, some agricultural measures could be initiated in order to make production more intensive and better organised. The value chain could be further extended by developing the processing industry. In addition to agriculture, other industries should also be looked to to contribute to the economic recovery. For instance, in some areas, social workers have launched several entrepreneurship programmes (online businesses, traditional artefacts) to equip displaced people with skills to broaden sources of economic income in new settlements. Moreover, development of the tourism and service industries could also facilitate economic development in a more sustainable way.

Furthermore, environmental migration could also represent an essential solution to the prevention and mitigation of natural disasters, in addition to sustainable development in this region. The introduction of and increasing recourse to environmental migration in the region could facilitate transformation from passive disaster reaction to positive environmental mitigation and adaptation, and a combination of environmental migration and poverty reduction could pave an innovative path for rural development in China and other developing countries.

In Chinese, the world “crisis” (Wei ji) is composed of two words: danger and opportunity. This earthquake is undoubtedly a severe calamity, yet it also presents an opportunity for the transition of the economy. Thus, following the completion of the resettlement process, the long-term approach must entail not only recovery from the earthquake, but also implications for sustainable future development.

REFERENCES

BOOKS AND REPORTS

- Christopher McDowell and Gareth Morrell. 2010. Displacement beyond conflict. Berghahn books. P. 69.
- IFRC. August 4, 2014. Information bulletin China: Ludian Earthquake. p. 2.
- Chris Lavell and Justin Ginnetti. 2014. The Risk of Disaster-Induced Displacement in South-East Asia and China, P.32. Oslo: IDMC & NRC.
- ESCAP. 2014. Disasters in Asia and the Pacific: 2014 Year In Review. Thailand: ESCAP.
- Yanquan. 2013. Introduction to cities. Yunnan Yearbook 2013. Yunnan.

ARTICLES

- Hewei: the Model of Ludian: a new milestone for the social work after disasters. China Society Periodical, 2014(30).
- Junli Zeng, Yongqin Yang. 2015(5). Local government's response to natural disasters—A Case of Ludian Earthquake. Journal of Anhui Agricultural Sciences.
- Shifang He et al. 2014(5). An overall introduction to the emergency work after the Ludian Earthquake. China emergency Rescue.

PRESS ARTICLES

- Bai Wenxue. 7th August, 2014. Poverty exaggerates natural disasters. In People's Daily.
- The distribution and intensity of the Ludian earthquake. 7th August, 2014. People's Daily.
- Yan Wang. 20th August, 2015. Preparation for the rehabilitation by Ludian County in Xinhua News Agency.

- Houyou Cai and Xunshen. 28th April, 2015. Half of the reconstruction of houses have been finished in Yunnan Daily.
- Yongfeng Zhao. 11th November, 2014. Rethinking Ludian earthquake, solutions to disasters and poverty in Yunnan Information Paper.
- Yanling Liu. 11th August, 2014. Checking potential geological risks in Ludian county in China News.

GOVERNMENT BULLETIN

- The central people's government of PRC. Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters. Adopted since 1st March 1998.
- The central people's government of the People's Republic of China (PRC). 23th November 2014. Notification of the overall plan about the reconstruction after the Ludian earthquake.
- News office of Ministry of Agriculture of PRC. 28th August 2014. http://www.moa.gov.cn/zwllm/zwdt/201408/t20140828_4027615.htm.
- Office of bureau of Civil Affairs in Yunnan Province. 14th August 2014. <http://yunnan.mca.gov.cn/article/lddz/gzdt/201408/20140800685894.shtml>.
- Report of the reconstruction of houses after the Ludian Earthquake (Mid-April). 29th April 2015. Yunnan: Bureau of Housing and Urban-Rural Development of PRC.
- Junyi Chen. 2013. The trail project of comprehensive management of stony desertification in Ludian County. Development and reform bureau in Ludian County.

- China Earthquake Administration. 2013. <http://www.cea.gov.cn/publish/dizhenj/467/490/20131127151858836596174/index.html>.
- Ludian County Government: A Brief Introduction of Ludian County. 2014. http://www.ludian.gov.cn/info_Show.asp?InfoId=365&ClassId=62&Topid=31.
- Ludian County Government: Longtoushan Town. 2014. http://www.ludian.gov.cn/info_Show.asp?InfoId=290&ClassId=84&Topid=82.
- Ludian County Government: Management of funding for rebuilding houses in settlements in Ludian County. 2015. http://www.ludian.gov.cn/defo_Show.asp?InfoId=2256&ClassId=54&Topid=31.

WEBSITES

- GSI International Steering Committee for Global Mapping, <http://reliefweb.int/map/china/global-mapand-around-zhaotong-yunnan-china-land-use-august-05-2014>.
- Earthquake report, <http://earthquake-report.com/2014/08/03/very-strong-earthquake-sichuan-yunnan-guizhou-rg-china-on-august-3-2014/>.
- Hongxin Nian. Everyone has 25 Yuan everyday during the emergent resettlement in affected areas in Zhaotong. 6th August, 2014 in Yunnan.cn. http://society.yunnan.cn/html/2014-08/06/content_3316043.htm.