

When Disasters are a Part of Home: The Hakka Community's Rootedness and Resilience to Periodic Landslides in Shenmu Village

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We never agreed [to the evacuation plan], we are definitely living here [Shenmu village]. We will only consider relocating to a safe and suitable location in order to rebuild our homes here. Some villagers had moved out, but they have come back now (Wang, 2009, cited from Kao, 2011).

According to Saylor's (1993, p 2) definition, a disaster 'has an identifiable beginning and end; adversely affects a relatively large group of people; is "public" and shared by members of more than one family'; and 'is traumatic enough to induce distress in almost anyone'. While we agree with Saylor's definition in general, in this paper, we address certain cases wherein disasters recur and it is difficult to define their origins and ends. In such instances, they are repeated events possessing their own life cycles. Under particular circumstances, the aftermath of such disasters takes from a few months to years to correct. In worst-case scenarios, these periodic disasters never cease but become integrated into the residents' way of life, shaping and reshaping their dynamic relationships within the physical landscape. The people and landscapes continually impacted by these events might never be able to return to their pre-disaster conditions. Instead, the landscape and its relationship to the local people are often repeatedly changed engendering new forms of landscape identity. Paton and Johnston (2006) argue that continual disasters could function as catalysts for socio-environmental change. People, communities and societal institutions might 'generate a stronger sense of community amongst those affected than had prevailed prior to the disaster' (Paton and Johnston, 2006, p 8).

More importantly, for communities, surviving continual disasters usually requires members to obtain local knowledge to reduce the impact of such disasters and carry on with their livelihoods. For half a century, scholars (Anderson, 1968; Dynes, 1970; Moore, 1964; Perry and Lindell, 1978; Wenger and Weller, 1973) have identified the residuals of survival knowledge as 'disaster subcultures'. Moore (1964, p 195) first proposed that a disaster subculture included 'adjustments, actual and potential, social, psychological, and physical, which are used by residents of such areas to cope with disasters which have struck or which tradition indicates may strike in the future'. Researchers (Dekens and Hewitt, 2008; UNISDR, 2008; Wisner, Blaikie, Cannon and Davis, 2004) in the field of disaster risk reduction (DRR) particularly argue that values, belief systems and organisations, as well as behavioural patterns, all integrate with the practices of disaster subculture. Different cultural communities respond to

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KEY WORDS

*Shenmu village
Community-based resilience
Periodic disaster
Landslide
Mudslide
Hakka culture*

RESEARCH

similar disasters differently, even though they might co-exist in the same region. The topic of how cultural practices have integrated with disaster adaptations and subsequent changes in lifestyle has been evolving in disaster studies. Lately, this focus has been mainly transformed into the critical research fields of community resiliency and disaster risk reduction studies.

More importantly, in this paper, we propose that the understanding of evolving processes of cultural practices is as crucial as the identifications of the cultural practices themselves. Culturally based problem-solving and risk management have to be cultivated and established within sequences of trial-and-error steps. Including 'natural' and 'technological' disasters, Dynes (1994) argues that mainstream disaster responses and emergency planning models in the United States have been based on a military response to an enemy attacking. It is a false assumption. A culturally based 'problem-solving' model is the orientation to move on. Within this line of scholarship, the Indian Ocean tsunami on 26 December 2004 plays a significant role. According to the Gaillard research team (Gaillard, et al, 2008), while 170,000 Acehnese and Minangkabau people died on the northern tip of Sumatra, only 44 Simeulue people were victimised on Simeulue Island close by and located near the earthquake epicentre. The research team argues the difference in the death toll does not lie in the nature of the hazard but, rather, in the cultural practices and ethnic contexts that produce different human behaviours. One year after the 2004 tsunami, the United Nations held a disaster reduction conference in Kobe and initiated the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters. The Hyogo Framework supports local knowledge as well as disaster subcultural practices. This further inspired the trend of culturally based disaster studies worldwide, including studies related to indigenous knowledge (Shaw, Uy and Baumwoll, 2008) or to gender and age (Giuliani, et al, 2009), those initiated by the United Nations (United Nations, 2009) and so on.

The study on Shenmu village presented in this paper comes under the theoretical backdrop mentioned above. It is an example of a village disrupted by continual mudslides and landslides for 16 years and how its disaster subculture and community-based resilient mechanisms have sustained residents' livelihoods in the village. In Nantou County, Taiwan, Shenmu village (it literally means the holy giant Camphor tree village) has been associated with landslides since 1996 (Figure 1).

Mudslides and landslides refer to massive debris flow events caused by the fragile geology of upper streams and by the extended periods of high-intensity rain normally associated with typhoon seasons in Taiwan. The damage caused by landslides and mudslides can lead to the loss of properties, buildings, public infrastructure (that is, bridges and roads) and even residents' lives. Interestingly, although Shenmu villagers have regularly experienced massive mudslides and landslides, the majority have decided to remain in their village homes. Under this backdrop, around 1994, one of us (Pochun Huang) first visited the village with his family before the disasters. Our fieldwork began officially in 1998, and the project has been ongoing since then (Huang, 2001). With a longitudinal scope of observations and investigations, we assert that Shenmu villagers' homes have been transformed by, and are intertwined with, the disasters of the past 16 years.

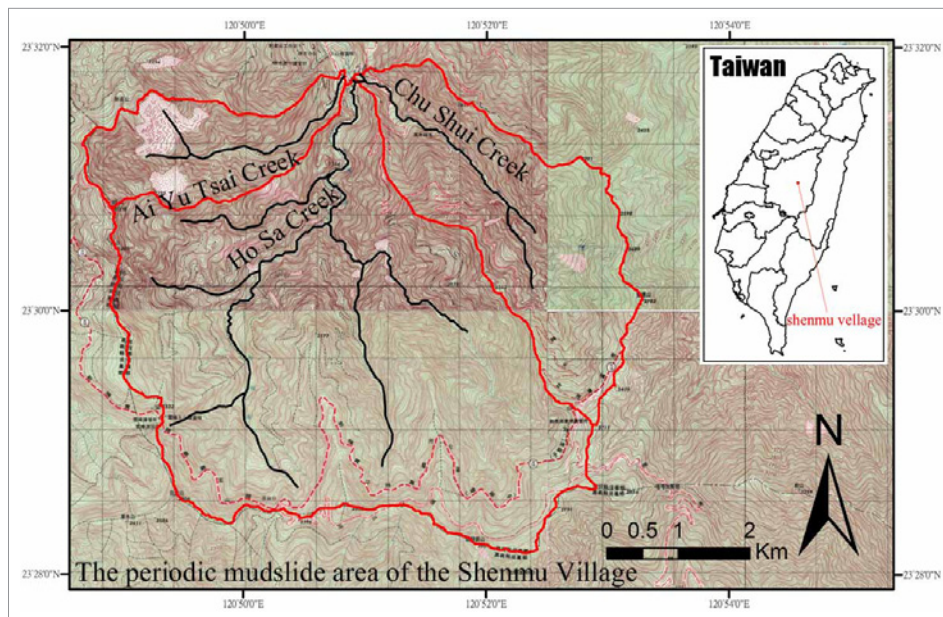


Figure 1: Location of the Shenmu village in Nantou County, Taiwan (cited from Chen, Chen and Wu, forthcoming).

Instead of undertaking post-disaster restorations, the villagers live with the disasters. Resilience to disaster is a core mechanism for rebuilding their village and transforming their home identity.

In brief, during this 16-year period, the central and local governments of Taiwan have been repeatedly repairing the damaged infrastructure and trying to convince residents to relocate to safer areas.¹ However, local residents, mostly farmers aged over 50 years, need the land as a source of income and cannot afford to buy or rent in another area. They argue they have had no choice but to stay in their landslide homes because the government's relocation plans cannot provide a reasonable means of production for their livelihood.

In this paper, we analyse the evolving relationship that characterises the residents' processes of internalising the continual landslide events within their home identities. Why have most families, from 1996 to 2011, decided to remain in their homes while some have departed in search of new homes? How is their emigration or rootedness related to the cultural practices of the Hakka (the people who live in this area)? While handling the intensifying landslide disasters for more than a decade, how has the Shenmu village community cultivated its capacity for resilience?

Applying an ethnographical approach, we have made frequent visits to Shenmu village for 14 years. We have revisited the village after most major mudslides and landslides (Figure 2), staying from a few days to several months. During our visits, we conducted in-depth interviews and participatory observations. We also engaged in different action research activities, such as teaching at the Shenmu Elementary School for one semester in 1999. By doing so, we have extended our understanding of the livelihoods of local families. In this paper, we introduce the local background of Shenmu village and explain the history of its landslides and mudslides. We then analyse the dynamics of dual residency between homes and shelters during the disaster period. From the perspective of community resilience, we have investigated local survival strategies in the face of periodic mudslides and landslides. Our research contributes toward a better understanding of how people handle periodic disasters through community-based and culturally related internal mechanisms in this era of climate change.



Figure 2: The mudslide river has formed an everyday landscape for Shenmu villagers since 1996.

Remote Shenmu village and its Hakka residents

Located in the Yushan Range, the highest mountain range in Taiwan, with an altitude of 3,952 metres, Shenmu village is a remote forest community between 1,200 metres and 2,000 metres above sea level. The name, Shenmu, refers to the 1,500-year-old giant camphor tree (*Cinnamomum camphora*) growing nearby (Figure 3). The Hakka ancestors of Shenmu village migrated to this area from the north-east Hakka communities of Taiwan. They believed the giant camphor tree was spiritual and mysterious; hence, the tree was considered to be a ‘Shenmu’, a holy tree. The Hakka (literally means ‘the guest’) are a sub-ethnic group of the Han Chinese who were the last group to immigrate to Taiwan in the eighteenth century. They often have had to struggle to survive on less desirable lands. They have been known for their diligent attitudes, willingness to pioneer new frontiers and take risks to seek new opportunities, while still preserving their cultural heritage and a sense of their roots (Chen, 1999a, 1999b).

The Shenmu Hakka migrants first arrived during the Japanese colonial period at the beginning of the twentieth century. Before World War Two, Shenmu Hakka villagers were workers in the camphor forest (Huang, 2000; Wen and Yeh, 2003). Shenmu villagers also had farms of castor beans (in the 1950s) and lemongrass (in the 1960s). After the 1970s, they gradually switched to agricultural production, especially summer vegetables and fruits.² However, they did not own their land. The land first belonged to the Japanese forest administration before World War Two. After the war, ownership of the land was given to the National Taiwan University. According to the 2012 census (Sinyi Township Household Registration, 2012), 345 households (924 people) lived in 12 sub-areas (called ‘Lin’ in Chinese) within Shenmu village.

‘The major problem we confront at Shenmu village is losing young people because of lack of land to farm.’ Mr Huang, a fourth generation Shenmu villager,



Figure 3: 'Shenmu' refers to this 1,500-year-old giant camphor tree (*Cinnamomum camphora*).

stated this on our first meeting at his Shenmu home in 2012. For Mr Huang, Shenmu village is similar to any other remote rural village in Taiwan. He believes the relocating of younger generations to urban areas is the key factor in his village's rapid decline. Although he might have been expected to narrate dramatic stories of the landslides, he never mentioned them until asked. Other residents we spoke with also seldom mentioned the topic of landslides during our conversations. To them, their homes seemed to be just as normal as anyone else's in Taiwan.

Landslides and home stays

Most Taiwanese know Shenmu village as the home of landslides. The first major one occurred on the last day of July in 1996 (Huang, 2001). At the time, the weakening typhoon Herb brought an unexpected amount of high rainfall to the central mountains of Taiwan. This 24-hour downpour, measuring 2,000 millimetres, was the worst disaster in Taiwan since the 7 August 1959 flood. As a result of the typhoon Herb rainfall, 51 victims died, 22 were missing and 463 were hurt. More than 500 properties were destroyed, while nearly 900 were made uninhabitable. More than 2,000 hectares of farmland were damaged by seawater. The 2009 Morakot typhoon hit damaged even more.³ According to the report of the Control Yuan (2009), the total cost of the Morakot disaster was more than half a billion US dollars. Among the damaged areas, Shenmu village was one of the worst hit, and the Taiwanese people learnt how tragic the consequences of mudslides and landslides could be from this single event.

Officials and villagers differ in their interpretations of the cause of the mudslides and landslides that have created continual disruption. The official disaster reports state that betel nut and summer vegetable farming led to topsoil

erosion problems, thereby fomenting mudslides and landslides. However, the local villagers believe the massive mudslides and continual landslides near Shenmu village are the result of construction dumps from the Central Cross-Island Highway project. Before completion of the road in 1991, Shenmu village was one of the tourist destinations in the Yushan Range. In spring, visitors would come to see the cherry blossoms. 'We had many food stands and huge tour buses parked on terraces at that time', Ms Hsu, an elementary school teacher, told us, while recalling her experiences before typhoon Herb in 1996. Now, everything has changed (Figure 4).

Compared with large-scale earthquakes and tsunamis (Table 1), such as the 2004 Indian Ocean earthquake and tsunami (Sumatra–Andaman earthquake), the 2008 Wenchuan earthquake in China, the 2011 Christchurch earthquake in New Zealand and the 2011 Tohoku earthquake and tsunami in Japan, the Shenmu village landslides could be identified as a local incident affecting only those within central Taiwan. However, the importance of the Shenmu village landslides comes from the resulting periodic disruptions. An account of the disasters unfolds different dynamics of human stress and environmental interference (Norris, et al, 2008). Table 1 shows the major landslides that occurred in Shenmu village between 1994 and 2012. When typhoons occur, the resulting landslides destroy bridges, bury roads, tear down homes and wash away farms. Even on less noteworthy rainy days, minor landslides are frequent. When the rolling stones move together and make a frightening noise, local residents prepare to run away from their homes to a place that can shelter them temporarily. However, as Mr Wang stated at the beginning of this paper, they never plan to evacuate to places outside Shenmu village, especially the residents living in the most vulnerable areas from 8 Lin to 11 Lin. Relocation is acceptable only if the new place is within Shenmu village.



Figure 4: Mega-scale mudslides and landslides have dramatically changed the local landscape of Shenmu village.

Year	International disaster(s) (selected)	Taiwan disaster(s)	Shenmu village disasters
1994		Typhoon Doug	Mudslides and landslides
1995	Great Hanshin earthquake, Japan		
1996		Typhoon Herb	Mudslides and landslides
1997		Heavy rain	Mudslides and landslides
1998	1998 Yangtze River flood, China Hurricane Mitch, Honduras, Guatemala and Nicaragua	Heavy rain	Mudslides and landslides
1999		921 earthquake	Mudslides and landslides
2000		Heavy rain	Mudslides and landslides
2001	Gujarat earthquake, India	Typhoon Nari and Typhoon Toraji	Mudslides and landslides
2002	2002 eruption of Nyiragongo volcano, Congo	Heavy rain	Mudslides and landslides
2003	Bam earthquake, Iran	Heavy rain	Mudslides and landslides
2004	2004 India Ocean earthquake and tsunami, Indonesia, Sri Lanka, Thailand, India, Somalia, Burma, Maldives, Malaysia and elsewhere	Typhoon Mindulle	Mudslides and landslides
2005	Maharashtra floods of 2005, India Hurricane Katrina, United States of America 2005 Kashmir earthquake, Kashmir	Heavy rain	Mudslides and landslides
2006	Java earthquake at Yogyakarta, Indonesia	Typhoon Bilis	Mudslides and landslides
2007		Typhoon Krosa	Mudslides and landslides
2008	Cyclone Nargis, Burma Wenchuan earthquake, China	Typhoon Sinlaku	Mudslides and landslides
2009		Typhoon Morakot	Mudslides and landslides
2010	2010 Haiti earthquake	Heavy rain	Mudslides and landslides
2011	Tohoku earthquake, Japan Christchurch earthquake, New Zealand	Heavy rain	Mudslides and landslides
2012		Heavy rain	Large-scale mudslides and landslides

Table 1: Timeline of selected international disasters, disasters in Taiwan and landslides and mudslides in the Shenmu village, 1994–2012 (data compiled by the authors).

According to geological researchers (Chen, 2011; Jan, 2004), channel conditions such as sediment yield and the width of river sections are important for analysing landslide-impacted rivers. Chen and colleagues (Chen, Chen and Wu, forthcoming) have provided a longitudinal analysis of how chronic landslides have been widening the riverbanks and changing sections of rivers in Shenmu village (Figure 5). They point out that typhoon Krosa in 2007 was the turning point. Before 2007, four major typhoons visited the area, but the width of the rivers had not changed much. The image of 2007 after Krosa shows clearly the width of rivers had dramatically changed. As time went on, the riverbanks widened more. By the time that typhoon Morakot hit the Shenmu village area in 2009, the profiles of local rivers had been dramatically and substantially widened. The rivers have forever been changed and moulded by landslides and mudslides. Figure 6 is a satellite photo taken after typhoon Morakot.

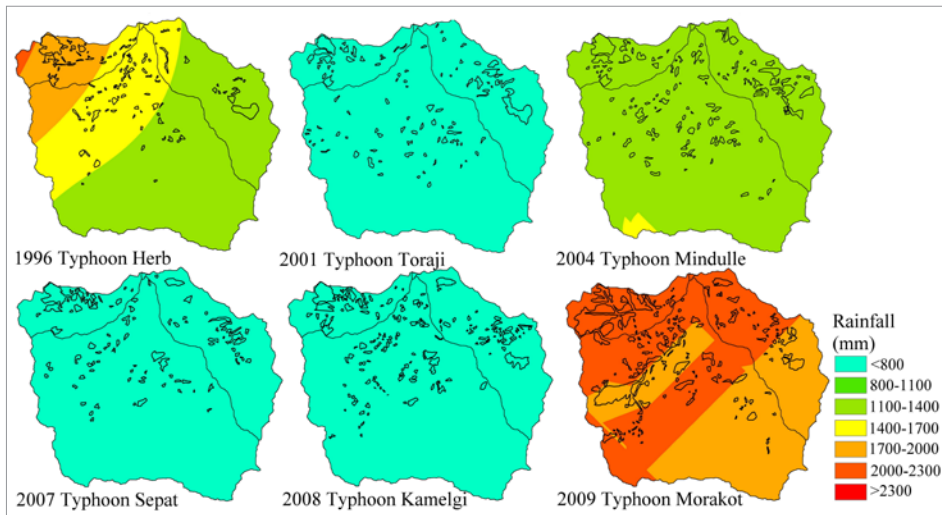


Figure 5: Chronic river profile analysis of the Shenmu village area from 1996 to 2009 (modified and cited from Chen, Chen and Wu, forthcoming).

Relocation not evacuation: Dual home identities with emergency sheltering

One of the most challenging transformations for a disaster victim is to bid farewell to their home that has been destroyed or made uninhabitable by a disaster (Dugan, 2007). Marcus, as well as other cultural landscape researchers, has recognised that home is a meaningful structure that intertwines with self-identity and cultural values (Altman and Low, 1992; Appleyard, 1978; Marcus, 1974, 1979, 1986, 1992, 1995). Psychologists and psychiatrists have showed that leaving behind a destroyed home and moving forward on an unknown life journey significantly traumatises the psychological health of residents of various age groups (Freedly, Shaw and Masters, 1992; Silverman and La Greca, 2002).



Figure 6: Chronic river profile analysis of the Shenmu village area post-typhoon Morakot in 2009 (Formosat-2 image © 2012 National Space Organization, Taiwan (NSPO) Formosat-2 image processing: Global Earth Observation and Data Analysis Center, National Cheng Kung University).

Indeed, for Shenmu villagers of the Hakka community, evacuation to a new place suggests a temporary or permanent loss of culture and rootedness that can create an identity crisis for an individual. More importantly, villagers have been economically troubled by the fact that, by uprooting from their family farms, they would lose their means of survival (Figure 7). The relocation plans proposed by government officials provide temporary or permanent housing solutions. Villagers, however, argue that the fundamental challenge for them is how to make a living when they cannot farm. Mr Huang spoke for the rest of the villagers, ‘Most villagers are senior farmers over the age of 50. How can we feed ourselves without our farmlands? What new job skills could we learn that will allow us to switch to new careers? Who will hire us?’. Permanent relocation outside Shenmu village is not acceptable to most villagers living in the government-identified danger zone (between 8 Lin and 11 Lin). Although their lives are often disturbed by broken bridges, destroyed roads and damaged farms and houses, the majority of the residents show no interest in relocating. Mr Huang told us, ‘Only a few neighbours whose farms were destroyed by the mudslides moved out’. From typhoon Herb to typhoon Morakot (1996–2009), less than 5 percent of the villagers inhabiting the danger zone relocated. After typhoon Morakot, residents negotiated with government officials and bargained for their farmlands. The most recent version of the relocation plan was finally modified to include a three-year farmland contract. However, residents still worry about their means of survival after the contracts expire.

Shenmu villagers have been practising dual residency between their homes and shelters during mudslide seasons. Even after the severe typhoon Morakot, most refused to relocate from their Shenmu village homes to new ones in the city of Nantou. In addition to the prospect of losing farmlands and a means of survival, their true fear is the cancellation of their household registrations within Shenmu village. Mr Huang told us, ‘If we relocate to the new permanent houses,



Figure 7: Hakka families disagree with the government's evacuation plan; they do not want to be uprooted from their homes and farms.

our household registrations will be cancelled. None of us will be allowed to report disaster damage and request government aid. However, I belong to one of the pioneer Hakka families who relocated here about hundred years ago. Why should I abandon my home in Shenmu village?’⁴ Residents speculate that relocation to new permanent houses is a government conspiracy. They believe Shenmu village will be abandoned after the comprehensive evacuation plan.⁵ Huang’s wife said to us, ‘How can we come back to farm, if our government doesn’t repair roads and bridges?’ Villagers have agonised about the long commute between the new government-provided houses and their Shenmu village farms and family homes.

Some senior villagers have pleaded with government officials to grant residents more time to live in these two homes. They believe that younger generations will identify the new houses as their homes, while the older generation will remain attached to the homes in Shenmu village. They trust that time will resolve the dilemma of dual home residencies. After a few decades, as they move on, home identity would transfer to the new houses. Shenmu village will gradually transform into a symbolic home. This symbolic relationship would be similar to their Shenmu village and Hakka hometown in northern Taiwan. Villagers only return to their Hakka hometown in the north every spring for the April tomb-sweeping festival. They wonder with deep frustration, ‘Why does the government want to rush us so much?’

Resilience: Shenmu local wisdom with internalised know-how processes

For all these years, villagers have been engaged in ongoing debates over whether to rebuild Shenmu village or evacuate to the new permanent houses. In Shenmu villagers’ minds, the periodic landslides do not prevent them from living in the village. To stay in their Shenmu village homes, they have collectively developed ‘do-it-ourselves’ rescue procedures beyond institutional services and resources. These procedures echo contemporary theories of community resilience, which see grassroots efforts as enabling communities to recover from disasters (Coles and Buckle, 2004; Ganor and Ben-Lavy, 2003; Manyena, 2006; Paton and Johnston, 2001, 2006; Paton, Millar and Johnston, 2001). In current disaster recovery theories, scholars emphasise that community resilience contributes to collective actions to plan for and ensure disaster readiness. Among the community resilience body of knowledge, Norris’s research team (Norris, et al, 2008) notes two essential ways in which it can make this contribution: (1) restoration of mental and physical health and (2) management and organisation of survival capacity during the disruption period. The Shenmu case obviously falls into the latter category.

Based on their local knowledge, Shenmu villagers have developed a comprehensive know-how for coexisting with predictable disasters on days with heavy rain (Figure 8) (Kao, 2011). We have generalised three critical ‘Shenmu villagers’ processes’ from our long-term field observations. First, they identify the intensity of the disaster by listening to different levels of noise made by the rolling stones. Ms Hsu told us, ‘When it rains, I pay attention to the thunder-like sound that mud creates. I know when to run’. Second, villagers organise recovery teams for construction of temporary structures. Mr Huang said, ‘It is too late to



Figure 8: On any days with heavy rain, landslides and mudslides of the Shenmu village might destroy roads and bridges. Villagers, therefore, have developed their own 'do-it-ourselves' rescue plan.

wait for our town officers to rescue us in such major landslides. We were forest workers before, we know how to cut trees and build makeshift bridges. We work as a team to build temporary paths, and the local government might come a week later. In some cases, we have had to wait even longer'. He explained that, besides the community-made bridges, villagers also took a narrow detour route for reconnecting to the main road, the Central Cross-Island Highway. Third, regarding food and water supplies, the villagers are all farmers. As Mr Huang said, 'We eat our own vegetables from our farms, and we know where to collect spring water around here [Shenmu village]'. In addition, power outages do not drastically affect the villagers. Many households store woodpiles at home, and they usually heat water using wood fires, not electricity.

In brief, the villagers have developed their own 'route' to survive from each mudslide and landslide. Between typhoon Toraji (2001) and typhoon Morakot (2009), no deaths were reported from periodic mudslide disasters. People have learnt where to run and how to reduce the level of damage to their properties, and, during those nine years, fewer than 10 households among the 90 most endangered ones had to relocate. Most of these migrant families had lost their farms during the mudslides and so, without any land to farm, were compelled to find other ways to make a living. Relocation was the only choice for them, and they moved to places close to their relatives in other townships and counties. Counting her students over her 13 years of teaching at the Shenmu Elementary School, Ms Hsu found that families of only three had left during that time.

Conclusion

After examining the Shenmu village case, we have highlighted two key findings for periodic disaster recovery. First, victims' home identities are strongly associated not only with culture but also with their means of survival. A successful relocation proposal must consider solutions that accommodate victims' daily needs and

their permanent connection with their destroyed home. It may take generations to transfer their identity from their old home to a new one. Second, survivors of continual disasters often develop strong and flexible community resilience processes for handling emergencies. Professional rescue plans and rebuilding projects may help them in the long run, but they have to survive the first critical period of three to five days using their own grassroots efforts. According to residents' experiences, professionals often propose inappropriate strategies for infrastructure reconstruction (that is, roads and bridges) that cause new problems during subsequent mudslides or landslides.

In conclusion, we have discovered that design and planning professionals play a minor role in rectifying the problems caused by Shenmu village's periodic disasters. The people in the community have creatively established methods for surviving the first critical stage of an event. Their deep bond with this remote village has profoundly influenced their perception of the safety of their lives by remaining at the mudslide-prone Shenmu village. In this era of climate change, it is likely that periodic disasters will be more frequent in many cities and countries. For this reason, it is critical to analyse the lessons from the Shenmu village case. Rootedness and community resilience have enabled the Hakka residents to maintain their sense of home in Shenmu village, even though mudslides and landslides have become a regular part of their environment.

Acknowledgements

We would like to express special thanks to Dr Cheng-Chien Liu at the National Cheng Kung University, Tainan City, Taiwan, and Dr Su-Chin Chen, Dr Chun-Hung Wu and Mr Shao-Chien Chen at the National Chung Hsing University, Taichung City, Taiwan. Without their agreement, we would not have been able to include figures 1, 5 and 6 in our paper. We also particularly thank Dr Wu who carefully modified figures 1 and 5 for our use in this paper.

NOTES

- 1 According to Taiwanese hazard law, governments are responsible for the repair of damaged infrastructure. Local residents, as long as they have household registration in the area, can report to a local government office and request a repair project. Therefore, local residents of Shenmu village do not dare to relocate and change their household registration status. They worry that, if they lost their household registration status, they would not be eligible for any post-disaster repair projects, and then would not be able to transport their agricultural products from Shenmu village to outside markets.
- 2 According to Kao (2011), Shenmu villagers learnt where the safe locations for farming were from their landslide experiences. They decided to separate their vegetable farms to different locations to avoid the risk of losing many farms close together in the same mudslide. However, according to our field notes, farmers have contracted land from the National Taiwan University and the 40-year rental contracts are not sufficiently flexible for change. Farmers could only farm within land under the National Taiwan University agreement. We doubt they had the flexibility mentioned in Kao's research.
- 3 However, the Morakot disaster recovery project in the Shenmu Village of Xinyi township and other projects in the Renai township of the Natou County involved scandals for Mr Lee Chao-chin, the Nantou magistrate. Mr Lee was accused of bribery in relation to the Morakot recovery road repair project on 30 November 2012. Lee and seven county officers were brought in for questioning. More importantly, Mr Hung Chia-yuan, acting chief prosecutor of Nantou District Prosecutors Office,

stated that ‘the alleged kickback involved in the case amounts to approximately NT\$10 million’. (Adam Tyrsett Kuo, *The China Post*, 30 November 2012, www.chinapost.com.tw/taiwan/national/national-news/2012/11/30/362626/Nantou-magistrate.htm)

- 4 According to Taiwanese laws, only registered residents can report infrastructure failures and receive compensation when major disasters occur.
- 5 Villagers are also afraid that the National Taiwan University will eventually cancel the land rental contracts. They vacillate between relocating and staying. If they relocate to the new houses, their commute time for farming would be four hours per day. However, if they do not relocate, they stand to lose everything when the National Taiwan University terminates the land rental contracts.

REFERENCES

- Altman, I and Low, SM (eds) (1992) *Place Attachment*, New York: Plenum Press.
- Anderson, JW (1968) Cultural Adaption to Threatened Disaster, *Human Organization* 27, pp 298–307.
- Appleyard, D (1978) *Home*, Berkeley: Institute of Urban and Regional Development.
- Chen, B (1999a) Ethnicity and Locality: Localization of Hakkaness in Taiwan. In The 4th International Hakka Symposium, Taipei, Z-G Hsu (ed), *Academia Sinica*, pp 305–338.
- Chen, S-C (2011) *The Chenyulan River Morphology Change Induced by Shenmu Watershed Sediment Yield*, Department of Soil and Water Conservation, National Chung Hsing University, Taichung, Taiwan.
- Chen, S-C, Chen, S-C and Wu, C-H (Forthcoming) The Characteristics of Debris Flow in Sheng Mu Village, *Journal of Soil and Water Conservation*.
- Chen, Y-D (1999b) An Investigation of the Hakka Study in Taiwan. In The 4th International Hakka Symposium, Taipei, Z-G Hsu (ed), *Academia Sinica*, pp 179–207.
- Coles, E and Buckle, P (2004) Developing Community Resilience as a Foundation for Effective Disaster Recovery, *Australian Journal of Emergency Management*, 19, pp 6–15.
- Dekens, J, and Hewitt, K (2008) *Socio-cultural Engagement and Sensitivity in Disaster Risk Reduction*. Paper read at Culture and Risks: How Socio-Cultural Settings Influence Risks from Natural Hazards e-conference hosted by International Centre for Integrated Mountain Development in Nepal.
- Dugan, B (2007) Loss of Identity in Disaster: How do you Say Goodbye to Home? *Perspectives in Psychiatric Care*, 43(1), pp 41–46.
- (1970) *Organized Behavior in Disaster*, Lexington, MA: Heath Lexington.
- Dynes, R (1994) Community Emergency Planning: False Assumptions and Inappropriate Analogies, *International Journal of Mass Emergencies and Disasters*, 12, pp 141–158.
- Freedy, JR, Shaw, DL, Jarrell, MP and Masters, CR (1992) Towards an Understanding of the Psychological Impact of Natural Disasters: An Application of the Conservation Resources Stress Model, *Journal of Traumatic Stress*, 5, pp 441–454.
- Gaillard, J-C, Clav, E, Vibert, O, Azhari, A, Dedi, D, Denain, J-C, Efendi, Y, Grancher, D, Liamzon, C, Sari, D and Setiawan, R (2008) Ethnic Groups’ Response to the 26 December 2004 Earthquake and Tsunami in Aceh, Indonesia, *Natural Hazards*, 47, pp 17–38.
- Ganor, M and Ben-Lavy, Y (2003) Community Resilience: Lessons Derived from Gilo Under Fire, *Journal of Jewish Communal Service*, Winter/Spring, pp 105–108.
- Giuliani, A, Wenger, R and Dach, SWV (eds) (2009) Disaster Risk Reduction: A Gender and Livelihood Perspective, *InfoResources Focus No 2/09*, pp 3–16.
- Huang, P-C (2001) *The Research of Environmental Risk Perception*, Masters Thesis, New Taipei City, Taiwan: National Taipei University.
- Huang, S-H (2000) *Hakka Community and the Camphor Industry in Taiwan*, Nantou, Taiwan Provincial Common History Historica.
- Jan, C-D (2004) *Introduction to Landslides*. Paper read at the 2004 Campaign and Outcomes for Soil and Water Conservation within School Teachers’ Professional Learning at Chiayi, Taiwan.

- Kao, W-J (2011) *Home on the Move: A Study of Relocation of Shen Mu Village, Nantou*, Masters Thesis, Nantou, Taiwan: National Chi Nan University.
- Manyena, SB (2006) The Concept of Resilience Revisited, *Disasters*, 30, pp 434–450.
- Marcus, CC (1974) House as a Symbol of Self. In *Fundamental Processes of Environmental Behavior*, JEA Lang (ed), Stroudsburg, Pennsylvania: Dowden, Hutchinson.
- (1979) *Environmental Autobiography*, Berkeley, California: Institute of Urban and Regional Development.
- (1986) *Home-as-Haven, Home-as-Trap: Explorations in experience of dwelling*, Berkeley, California: Center for Environmental Design Research.
- (1992) Environmental Memories. In *Place Attachment*, I Altman and SM Low (eds), New York: Plenum.
- (1995) *House as a Mirror of Self*, Berkeley, California: Conari Press.
- Moore, HE (1964) *And the Winds Blew*, Austin, Texas: University of Texas.
- Nantou County Government and XinYi Township (2009) *Nantou County Government and XinYi Township. Shenmu Village habitation safety evaluation report for the post-Typhoon Morakot period, XinYi Township Nantou County*, Nantou, Taiwan: Nantou County Government and China Engineering Consultants Inc.
- Norris, FH, Stevens, SP, Pfefferbaum, B, Wyche, KF and Pfefferbaum, RL (2008) Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness, *American Journal of Community Psychology*, 44, pp 127–150.
- Paton, D and Johnston, DM (2001) Disaster and Communities: Vulnerability, Resilience and Preparedness, *Disaster Prevention and Management*, 10, pp 270–277.
- (2006) *Disaster Resilience: An Integrated Approach*, Springfield, IL: Charles C Thomas.
- Paton, D, Millar, M and Johnston, DM (2001) Community Resilience to Volcanic Hazard Consequences, *Natural Hazards*, 24, pp 157–169.
- Perry, RW and Lindell, MK (1978) The Psychological Consequences of Natural Disaster: A Review of Research on American Communities, *Mass Emergencies*, 3, pp 105–115.
- Saylor, CF (1993) Children and Disasters: Clinical and Research Issues. In *Children and Disasters*, CF Saylor (ed), New York: Plenum Press.
- Shaw, R, Uy, N and Baumwoll, J (2008) *Indigenous Knowledge for Disaster Risk Reduction: Good Practices and Lessons Learned from Experiences in the Asia–Pacific Region*, Bangkok: International Strategy for Disaster Reduction, European Union.
- Silverman, WK and La Greca, AM (2002) Children Experiencing Disasters: Definitions, Reactions, and Predictors of Outcomes. In *Helping Children Cope with Disasters and Terrorism*, AM Le Greca, WK Silverman, EM Vernberg and MC Roberts (eds), Washington, DC: American Psychological Association.
- Sinyi Township Office (2012) *Sinyi Township Household Registration 2012*. Edited by Sinyi Township Office, Nantou, Taiwan: Sinyi Township Office.
- The Control Yuan ROC (2009) *The Control Yuan ROC Investigation Report for the Typhoon Morakot 2009*. Edited by The Control Yuan ROC, Taipei, Taiwan: The Control Yuan ROC.
- UNISDR (2008) *Indigenous Knowledge for Disaster Risk Reduction: Good Practices and Lessons Learned from Experiences in the Asia-Pacific Region*, Bangkok, Thailand: United Nations International Strategy for Disaster Reduction.
- United Nations (2009) *Disaster Risk Reduction in the United Nations: Roles, Mandates and Areas of Work of Key United Nations Entities*, Geneva: United Nations International Strategy for Disaster Reduction.
- Wen, S-B and Yeh, M-R (2003) *The Development of the Taiwanese Camphor Industry and the Distribution of Hakkaness*, Tainan, Taiwan: Tainan Hakka Cultural Association.
- Wenger, DE and Weller, JM (1973) *Disaster Subcultures: The Cultural Residues of Community Disasters*, Delaware, Newark: Disaster Research Center, University of Delaware.
- Wisner, B, Blaikie, P, Cannon, T and Davis, I (2004) *At Risk: Natural Hazards, People Vulnerability and Disasters* (2nd edn), London: Routledge.