Disaster Resilience: Constructing a Disaster Resistant Community

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Abstract

This study examined factors promoting disaster resilience. A total of 15 participants, including four males and 11 females, participated in interviews that explored four research questions: 1.) what factors influence your disaster resilience? 2.) what have you done for disaster preparedness? 3.) what factors influence your disaster preparedness? and 4.) what would be your suggestions for disaster response workers? Research findings indicate that *social support networks*, *serving others*, *Hakka spirit*, *self-reliance*, *resource availability*, *governmental agencies*, *preparedness*, *acceptance*, and *spirituality* have direct and positive impacts on disaster resilience. *Post-disaster life events* and *experience of natural disaster* have direct but negative impacts on disaster resilience. *Preparedness* and *resource availability* are associated with *governmental agencies*. *Resource availability* has a direct and positive impact on *self-reliance*. *Post-disaster life events* may weaken *social support networks*. *Self-reliance* is an important property of *Hakka spirit,* and *Hakka spirit* has a positive and direct impact on *attitudes toward disasters*. *Disaster education* is part of *preparedness*, and has a direct and positive impact on *attitudes toward disasters*.

Keywords: disaster resilience, Hakka spirit, social support networks, resource availability, preparedness

災害復原力：建構一個防災社區

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摘　　要

　　本研究針對台中縣東勢地區居民進行質性資料的蒐集與分析，深入了解影響當地居民災害復原力的因素。共訪問了四名男性11名女性年齡介於35歲與75歲之間的東勢鄉親，所蒐集的資料使用質性資料分析軟體ATLAS.ti 5.5進行編碼與內容及跨個案分析，研究結果發現，對*災害復原力*有直接且正向影響的因素包括*社會支持網絡、助人、客家精神、自立、資源可用性、公部門、災害整備、接納*及*宗教信仰*。對*災害復原力*有直接但負向影響的因素包括*災後生活事件*和*災害經驗*。社區居民的*災害整備*情形及*資源可用性*與公部門息息相關，而且*資源可用性*會影響居民的*自立程度*。 *災後生活事件*與*家庭支持*有關且對*社會支持網絡*有負面影響。*自立*是*客家精神*的重要屬性之一，而*客家精神*會影響*對天然災害的態度*。*防災教育*是*災害整備*的一部份，會直接影響居民*對天然災害的態度*。

關鍵詞：災害復原力、客家精神、社會支持網絡、資源可用性、災害整備

Introduction

Lin (2002) has claimed that there has been a tendency for natural disasters to become more severe and occur more frequently. According to the Ministry of Interior Statistical Information Service, 270 natural disasters, including 196 typhoons, 49 floods, 22 damaging earthquakes, and three other disasters attacked Taiwan from 1958 to 2007 (MOI, 2008). More than 32,944 people died or were injured. Loss of lives and property damage were major concerns. In addition, MOI (2002) has reported that, on average, about 2,200 tremors occur in Taiwan every year. Although most of them seldom threaten people's lives or property, devastating earthquakes strike Taiwan every 20 to 30 years. More than 7,000 sensible tremors occurred from 1996 to 2001. An extremely high frequency was recorded in 1999 and 2000. Over 4,000 tremors shook Taiwan in those two years. Two destructive earthquakes, the 921 Earthquake (September 21) and the 1022 Earthquake (October 22), occurred in 1999 ("A brief analysis of natural disasters in Taiwan," n.d.). The 921 Earthquake, with a magnitude of 7.6 on the Richter scale, was responsible for approximately 2,415 deaths, 29 people missing, 11,306 injuries, and making more than 110,000 people homeless. Of all affected counties and cities, Taichung County suffered the highest death toll with 1,194 (or 49%). At the township level, Tung Shih suffered the highest death toll with 358 (Disaster Response Report, 2008).

In the past, disaster studies tended to focus on affected population's mental health concerns (e.g., Everstine & Everstine, 1993; Figley, 1995; Mitchell, 1996). Despite the widely accepted assumption of the theoretical linkage between disasters and mental health concerns, some researchers have found that disasters can facilitate resilience (Al-Naser & Sandman, 2000; Greene, 2002; Paton & Johnston, 2001; Sattler, 2003). Furthermore, Echterling (2001) claimed that many survivors reported experiencing positive changes as a result of the disaster. His study results have shown that positive meaning in the disaster helped survivors to cope better. A natural helping network was evolved among the survivors to promote recovery process by offering practical assistance as well as emotional support such as sharing stories.

Gradually, disaster resilience has become a major concern in the social science literature that deals with human response to natural disasters. Disaster resilience

involves using resources that are intrinsic to the individual or community to maintain or regain pre-disaster levels of functioning regardless of the disaster. It is the ability of survivors to keep going in the face of disaster. Paton and Johnston (2001) described community resilience as "the ability of a community to 'bounce back' and recover using its own resources…" (p. 272). Disaster resilience "… requires that attention be directed to safeguarding the physical integrity of the built environment and lifelines, and ensuring economic, business and administrative continuity" (p. 272). Paton and Johnston have also acknowledged that the assumption of an automatic link between exposure to disasters and mental health concerns is increasingly being questioned. Researchers have emphasized the importance of examining factors such as social support networks and spirituality that promote disaster resilience in disaster studies (Linley & Joseph, 2004; Paton & Johnston, 2001). Paton, Violanti, and Smith (2003) even claimed, "We can learn and even prosper from exposure to adversity" (p. 205). Likewise, Saleebey (2002) has asserted that although traumatic events may be damaging, they may be sources of new opportunities that would not have been otherwise.

The concept of resilience is of great importance to social work practice (Greene, 2002), especially for social workers who work with people experiencing traumatic events and residents in disaster-prone areas. Social workers have long been committed to a "strengths-based practice" that promotes people's resilience (Saleebey, 2002). Based on published reports, clearly, natural as well as man-made disasters have become a recognized part of human experience. Subsequently, more social workers would be expected to work with disaster survivors or even work in disaster-affected areas. For instance, there were many social workers participated in the relief work in and after the August 8 Flood in Southern Taiwan. Social workers will need to understand what helps survivors to function well during and after disasters, and how to incorporate this knowledge into new practice strategies that foster the survivors' strengths and resilience.

In this study, 15 participants were asked to share their stories related to disaster resilience. Data on suggestions to disaster response workers on improving service quality were also collected. ***Social support networks, serving others, Hakka spirit, self-reliance, resource availability, governmental agencies, preparedness, acceptance,*** and ***spirituality*** are found to have positive impacts on disaster resilience.

Literature Review

In this section, the focus will be on social support networks and spirituality because they are commonly studied factors influencing disaster resilience. Other emerged themes will be discussed in the Lessons Learned section.

Social Support Networks

The effect of positive social and family supports on disaster survivors has been known to be significant for some time. Researchers could not stress enough the importance of having a strong family support system and staying connected to the community in times of crisis. The National Center for Post-Traumatic Stress Disorder (2001) reported, "Supportive networks are critical and should be retained, reinforced and rebuilt" (p. 1). Similarly, Cohen and Ahearn (1980) emphasized that, "(A) supportive network of family and friends is extremely important in the process of re-adaptation and resolution" (p. 13).

Some researchers have found that disaster survivors usually turned to their relatives, neighbors, and friends for the emotional assistance they needed. Family and friends were relied upon more often, and with greater comfort, than outsiders or professional helpers (Karanci et al., 1999; Lyons, 1991; Norris et al., 2001). In addition to having a strong family support system, connecting to the community also contributes to the establishment of social support networks. Ursano et al. (1995) affirmed that the community can serve as a physical and emotional support system for disaster survivors. Echterling (2001) found that many disaster survivors established social support networks among themselves to facilitate the recovery process.

In a 1995 Kobe, Japan earthquake study on evacuees, Kato et al. (1996) found that their elderly participants experienced less emotional distress than their younger counterparts because the elderly participants had lived in the community for a longer time, which gave them the advantage of being able to quickly establish social support networks in the shelter. Also, the family-oriented collectivist culture ensured the Japanese elderly a strong family support system.

These findings were based on the role of social support networks in individualist cultures (e.g., Cohen & Ahearn, 1980) and collectivist cultures (e.g., Kato et al., 1996).

Regardless of the participants' cultural backgrounds, most of the researchers found that social support networks were positively associated with the survivors' disaster resilience.

In this study, social support networks refer to interdependence among family members, clan members, relatives, neighbors, and friends. The family in Tung Shih ideally includes a patriarch and his wife, their sons and their wives as well as children. Three generations, occasionally four generations, under one roof is a common family structure in Tung Shih. The concept of clan is relatively important to the local people. Because people in Tung Shih are quite territorial, their clan members tend to live in the same area.

Spirituality

Koenig, McCullough, and Larson (2001), authors of the *Handbook of Religion and Health*, define spirituality as "the personal quest for understanding answers to ultimate questions about life, about meaning, and about relationship to the sacred or transcendent" (as cited in Corley, 2003, p. 79). In Taiwan, spirituality is seen as a philosophy and a way of life - living harmoniously with Nature. It is based on the fundamental inter-connectedness of all natural things and all forms of life, which means that "all things of heaven and earth are connected by the life force" (Davison & Reed, 1998, p. 32). Generally speaking, people in Taiwan consider natural disasters the will of gods. They do not try to control nature, but strive to live with it in a harmonious way (Jordan, 1999). This unique collaborative lifestyle provides them opportunities to feel that the gods are at their side.

Spirituality has great importance in many people's lives, especially disaster survivors. It helps survivors find meaning in disaster, death, and answered questions about life-after-death. It provides ways for the survivors to feel connected. Nathanson (2003) claimed that "spirituality is an important force in recovery" (p. 63), because it helps the survivors identify inner strengths and find meanings for sufferings. Believing that a spiritual force is "watching over" their daily needs may bring great comfort to the survivors. Cadell et al. (2003) affirmed that, "One way individuals who face traumatic events attempt to find meaning is through religion or spirituality" (p. 280). They further claimed that "posttraumatic growth would increase as spirituality grew" (p. 283).

Besides providing meanings to the survivors, spirituality is also associated with practical assistance. Tirrito and Cascio (2003) reported that religious groups carried out many community services in disaster-affected areas. Norwood, Ursano, and Fullerton (2000) found that churches and synagogues played an important role in assisting survivors' search for meaning from disaster and in assisting in the grief process. In Taiwan, religious organizations such as Tzu Chi Foundation and Dharma Drum Mountain often provide similar services for disaster survivors and affected communities.

Methodology

A semi-structured in-depth interview was used for qualitative data collection. The rationale for choosing qualitative study because qualitative and disaster research share a common flexibility. Disaster challenges affected areas in unexpected ways and with unanticipated consequences. Qualitative research offers the opportunity to identify relevant questions and to probe in-depth (Phillips, 1997). Tedeschi and Calhoun (1995) have suggested that an important step for further understanding of disaster resilience is to use extensive interviews with disaster survivors and people who are associated with the survivors. Additionally, qualitative research works well within the Taiwanese cultural context because the Taiwanese people are relational. It is easier to build a relationship of trust with a few "information-rich" individuals than a calculated proportion of the population.

Sampling

Connections are essential to people in Tung Shih. Without connections, it could be challenging to interview people there. Thus, the snowball sampling strategy was utilized for selecting "information-rich" participants for study in depth. The snowball started with two local key informants who were community leaders in Tung Shih. These two key informants were asked to refer prospective participants for this study. The criteria were that prospective participants must be: (a) 20 years or older, (b) survivors of the 921 Earthquake, and (c) residents of Tung Shih. Subsequently, the prospective participants were invited to refer people who they knew met the above criteria and were willing to participate in this study. In order to hear various voices,

the researcher purposively interviewed people from different social economic statuses. A total of 15 participants were interviewed, including four males and 11 females (see Table 1).

Table 1. *Characteristics of Participants*

ID	Gender	Age	Background	Education	Occupation
TW01	F	30s	3-generation under one roof	Junior college	Pre-school teacher
TW02	M	40s	Wife with mental health concerns, son in 3rd grade	Elementary	Blue-collar worker
TW03	F	50s	Part-time religious worker	College	Elementary school teacher
TW04	F	40s	Domestic violence survivor	Junior high	Housewife
TW05	F	60s	Volunteer	College	Retired teacher
TW06	M	50s	4-dimentional religious worker	College	Retired teacher
TW07	F	40s	Volunteer	Junior college	Self-employed
TW08	F	60s	Survivor of the 921 EQ & 7-2 Flood, Buddhist	Elementary	Housewife
TW09	M	60s	Survivor of the 921, widower	Elementary	Farmer
TW10	F	40s	Single mom, lost her husband to the 921	Senior high	Seasonal worker
TW11	F	50s	Participated in the 921 relief work	Junior college	Nurse
TW12	F	60s	Volunteer	Junior college	Retired
TW13	F	40s	Hakka cultural preservation worker	College	Elementary school teacher
TW14	M	70s	Survivor of the 921, living alone, Buddhist	Elementary	Recycling
TW15	F	40s	Survivor of 921, single mom	Junior high	Blue-collar worker

Data Collection

In-depth interview was used to obtain information related to disaster resilience. A question guide that consisted of four questions was used to keep the interview

focused. In-depth interviews provided the participants opportunities for using their own language to share their stories with the researcher. The following data were collected

1.) What factors influence your disaster resilience?

2.) What have you done for disaster preparedness?

3.) What factors influence your disaster preparedness?

4.) What would be your suggestions for disaster response workers?

After each interview, the audio file was reviewed to ensure that it was functioning properly, and the quality of information received from the participant was relevant to this study. The goal of the qualitative data collection was to record what the researcher heard from participants, in terms of their thoughts, feelings, attitudes, and more.

Data Analysis

A qualitative data analysis software package, ATLAS.ti 5.5, was employed for textual analysis. A case-oriented cross-case analysis was utilized for this study. The reason for choosing a cross-case analysis was to "deepen understanding and explanation" (Miles & Huberman, 1994, p. 173). The researcher compared the patterns of participants' responses among cases.

Interviews and field notes were reviewed, and reflection notes of the review were written. All transcriptions, field notes, memos, and reflection notes were imported to ATLAS.ti 5.5 for the purposes of coding and data analysis. Models were used for mapping relationships among themes. The themes or patterns of participants' response among cases were compared to see whether they were congruent with each other or not. Data sources triangulation (e.g., interviews, direct observations, field notes) was used to check the accuracy of the findings. Interpretations and explanations of the findings were carefully constructed within the Taiwanese cultural framework.

Lessons Learned

The emerged themes indicate that *social support networks, serving others, Hakka spirit, self-reliance, resource availability, governmental agencies, preparedness, acceptance, and spirituality* have direct and positive impacts on

disaster resilience. *Post-disaster life events* and *experience of natural disaster* have direct but negative impacts on *disaster resilience*. *Preparedness* and *resource availability* are associated with *governmental agencies*. *Resource availability* has a direct and positive impact on *self-reliance*. *Post-disaster life events* may weaken *social support networks*. *Self-reliance* is an important property of *Hakka spirit,* and *Hakka spirit* has a positive and direct impact on *attitudes toward disasters*. *Disaster education* is part of *preparedness,* and has a direct and positive impact on *attitudes toward disasters* (Figure 1).

Figure 1. Relationships among Themes
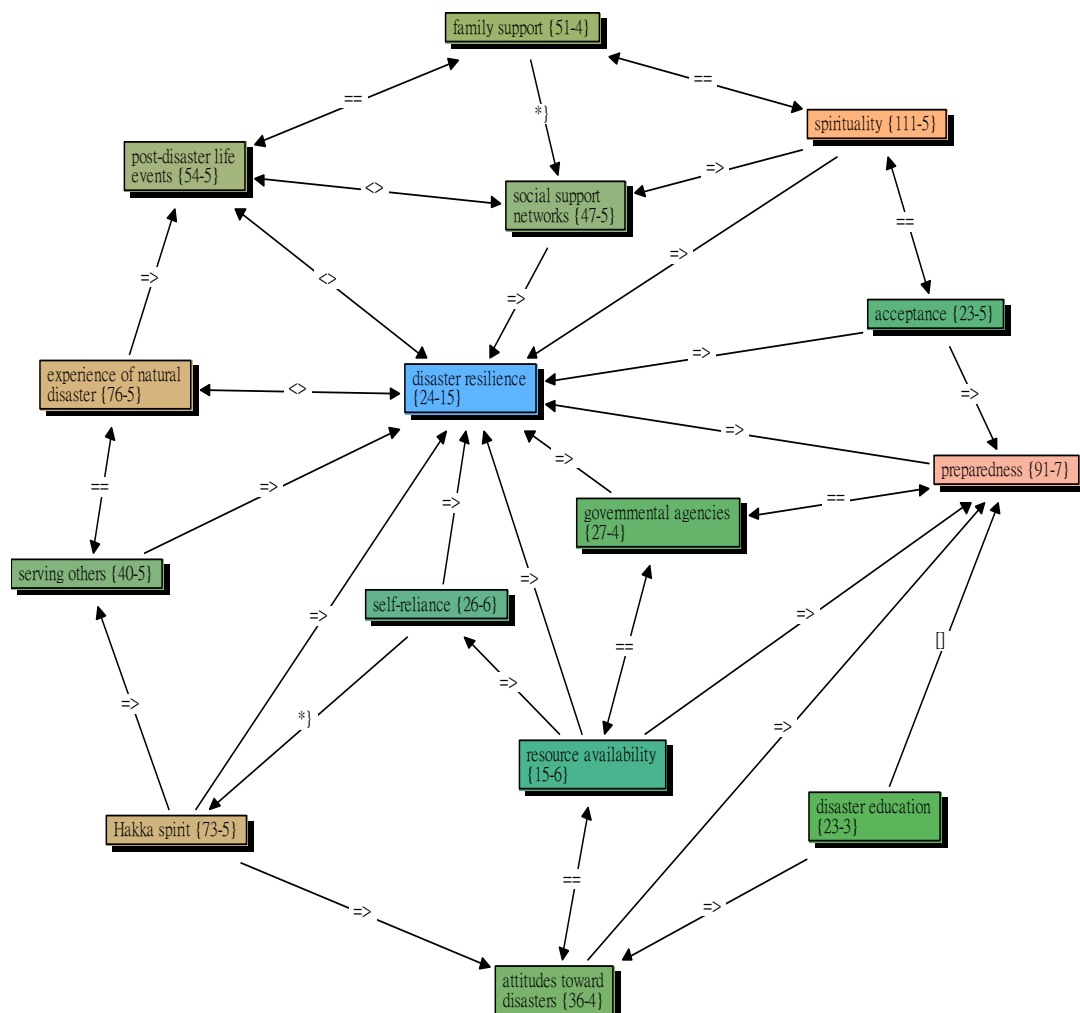
Note: => is cause of, == is associated with, [] is part of, *} is property of, <> contradicts

Acceptance

Studies indicate that accepting disasters as part of life experience and desiring to live harmoniously with Nature have positive impacts on disaster resilience (Jang, 2008; Jang & LaMendola, 2006). Acceptance means that survivors accept the established fact and are willing to face challenges. In this study, some participants likened natural disasters to ordeals from Heaven. They stressed that no matter how hard the tests might be, life must go on. Others strongly encouraged the researcher to focus on the here-and-now.

"Each natural disaster is like an examination from gods. They have set up times for examinations. Whether I pass the exam or not, life goes on" (TW 08).

"Focus on the here and now. No need to worry about the past nor the future. The fact is the disaster already occurred. I cannot change the fact, so I would rather choose to face it" (TW 14).

"I accept whatever happened and may happen to me. That's my fate. I cannot and am not going to change my fate. The best way to deal with disaster is to accept the fact and move on with my life" TW15).

"No one would know what may happen to him/her the next minute. We are here talking and laughing. Who knows what may happen to you or me tomorrow? Do our best and focus on the here-and-now" (TW 12).

Preparedness

With regard to *preparedness,* participants value disaster education and personal disaster mitigation plans. Similarly, Rosenfeld et al. (2005) point out that disaster education is an essential part of community preparedness. It aims at enhancing readiness to act according to the proposed emergency operation plan. Natural disaster like earthquake often occurs without warning. Human beings are not capable of wrestling against the Nature. People cannot stop disasters from happening. Thus, they need to rely on preparedness to reduce damages that may cause by disasters.

"Just a few days before the 921 Earthquake, I was setting up mid-Autumn

Festival activities. For some reason, I prepared flashlights as gifts for activity attendees. Later, those flashlights helped my community members find ways in the darkness. Since then, I always have flashlights around my home, my office, and so forth" (TW 06).

"I have learned to fasten furniture to walls or beams. Either typhoon or earthquake often shakes the house. If I had fastened my furniture, I would not have suffered such a great loss to the 921 Earthquake" (TW 13).

"I think I am more prepared than before. If destructive earthquake occurred again, I shall know how to protect my family, reduce the damage, and where to go for help" (TW 07).

Self-reliance

Comparing to other factors, *self-reliance* is relatively less discussed. But, similar ideas such as self-efficacy (Bandura, 1989) and perceived control of resource availability have been tested to have positive impacts on disaster resilience (Benight, et al., 1999; Norris, Byrne & Diaz, 2001). Job security and good health conditions are essential to self-reliance. Job security ensures financial stability and reasonable living quality. Good health conditions provide strengths required to enjoy life, move forward, and face daily challenges. In this study, participants recognized the importance of health on self-reliance. Participants pointed out that there was no free lunch. Survivors could not just sit and wait for assistance from the government or non-profit organizations. No matter what happened, community members must rely on their own strengths to improve the conditions. Participants emphasized that being self-reliant made them feel happy and have a sense of achievement. Although participants stressed the importance of self-reliance again and again, they did not deny the roles of the government in disaster management plans.

"We seldom ask help from outsiders. That's our responsibility to get on our feet again" (TW 01).

"There is no free lunch. If we want to reap, we have to plant first. We cannot sit there do nothing, but wait for services from the government or non-profit organizations. I think we need to be self-reliant" (TW 05).

"No matter what happen, the key is to be self-reliant" (TW10).

"We cannot change the government's policy or other people. But, we can do something for ourselves. For example, I grow vegetables to support myself. I am happy that I don't need to rely on other people, or wait for their support" (TW 15).

Spirituality

The impact of spirituality on disaster resilience cannot be overlooked. Spirituality offers explanations of death, life, loss, as well as natural disasters. It brings comfort to participants. In this study, Participants indicated that with the support from religious belief, they have found ways to cope with challenges. They affirmed that religious belief has helped them to be more optimism and see positive side of things. They also learned not to go to extremes. Likewise, Cadell et al. (2003) asserted that the reconstruction of meaning is necessary because disasters often distort survivors' perception of self and the world. They also found that disaster resilience increases as spirituality grows.

Spirituality often guides norms and people's values. The Taiwanese people often use poe divination to denote gods' will (Jordan, n.d.). Spirituality would strengthen residents' social support networks and enhance their sense of community. It even influences residents' level of acceptance on natural disasters. In this study, participants believed that it was essential to understand the cycle of Nature. Participants claimed that religious beliefs encouraged them to work on personal merits and practice moral culture. People need to reflect on themselves when experience natural disasters. The following words of the respondents were commonly used to describe spirituality:

"First of all, people need to understanding the physiological cycle of Nature … Feeling being supported by a higher Being is important, especially when encounters challenges" (TW 03).

Religious belief has a great impact on my attitudes toward disasters. It helps me to have a better understanding of its meaning. It teaches me not to have pessimistic or extreme ideas" (TW 01).

"I think natural disaster is tests from Gods. My religious belief encourages people to work on personal merits and practice moral culture" (TW 08).

"I really appreciate the assistance of Gods. I really believe that there is an invisible yet existing force" (TW 03).

"… Learned to cherish what you have. Be grateful for being able to serve others. That's a type of happiness" (TW 05).

Hakka Spirit

Hakka spirit was defined as "The spirit of *sturdy neck* which means to hold on firmly despite extreme adversity, or to keep on doing something without regard to one's own strength." (Jang & LaMendola, 2006). Most of the residents of Tung Shih are Hakkas. Hakka spirit is the essence of their culture which consists of characteristics such as frugality, diligence, self-reliance, responsibilities, and persistence (Jang, 2008, Paton & Jang, in press). Here *Hakka spirit* was not reserved for the Hakka people only. It was the spirit shared by all residents of Tung Shih regardless of their ethnicity. Those non-Hakka participants have adapted *Hakka spirit* to a certain extent. The residents of Tung Shih have even learned to accept disasters as part of life experience and live harmoniously with Nature. Normalization and living with disasters are traits of disaster resilience. Sense of responsibility is one of the traits of Hakka spirit. Several participants believed that Hakka spirit was key factor that helped residents of Tung Shih to recover from the 921 Earthquake. Participants often used the following words to describe Hakka spirit:

"People in Tung Shih are quite determined. They are very hardworking people. They are determined in terms of family reconstruction project" (TW 01).

"… The Hakka people refuse to concede defeat" (TW 07).

"I rely on the strong determined will to pass through terrible ordeals. It's not easy. I lost most of my properties to the 921 Earthquake. How can I fully recover from that catastrophe? I would not be able to make it without strong determined will" (TW 10).

"Will power is essential. You got to have a strong will. Otherwise, you would not be able to overcome challenges" (TW 02).

Serving Others

Serving others often makes people feel that they are needed and wanted. It helps people feel being useful to others. It also helps survivors to have a better

understanding of the meaning and values of life. Through the process of *serving others*, it not only enhances the efficiency of assisting others, but also helps survivors themselves as well as others to grow. It leads survivors to gain new meaning and explanation for life after disasters (Al-Naser & Sandman 2000; Farley 1998).

"I found that caring for others helps me find hope in this world and makes me feel good about myself" (TW 01).

"I often homevisit people in need. I may not be able to bring much resource to their families. I simply listen to their stories. Being there for them makes me feel good about myself. I think I am doing something to make this world better" (TW 07).

"I always purchase some local produce when I visit disaster affected areas. I like to help those small business owners. By doing so, I may bring some hope to their business" (TW 13).

"… many of my students' families were affected by the 921 Earthquake. I didn't know how to counsel those student survivors and/or their family members. Thus, I participated in a free counseling training course led by pro bono clinical psychologists. I was not a professional counselor. I did not do counseling. All I did was to actively listen to their stories. Since then, I have been voluntarily serving the community members. My crisis coping skills have been sharpened through serving others" (TW 05).

"I like to show my care towards the elders, especially those who live alone. I express my care for them when I visit them at home. I think my visit may bring some hope to their life. At least, they know that someone cares about them. I believe that feeling being cared and loved is important to everyone" (TW 01).

Social Support Networks

Disaster studies have found that *social support networks* have positive impact on disaster resilience (e.g., Abramson et al., 2008; Jang, 2008). Nelson (2008) suggests that after Hurricane Katrina, community re-construction should focus on meaningful social support activities. Figley and McCubbin (1983) have stressed that survivors can gain immeasurable benefits by talking with other survivors and discuss mutual

concerns. As many disaster studies indicate, social support networks would facilitate survivors' disaster resilience (Linley & Joseph 2004). Rosenfeld et al. (2005) have even suggested that disaster workers check survivors' social support networks, and help them create one if they need. In this study, the researchers found that for those who re-establish social support networks tend to be more resilient than those who do not mend theirs. In line with the above studies, participants indicated that *social support networks* supported them pass through ordeals. For example, some participants commented:

> "… residents in the neighborhood helped each others, worked together to pass through that period of time. People in the neighborhood showed their loving care for each other, listened to each other…" (TW 05).

> "Hakka people are close to their clan members. Right after the catastrophe, they put things together to make meals. In my neighborhood, we shared our food with the entire neighborhood" (TW 06).

> "Tung Shih is a closed hillside township. Most of the local people are somehow related to each other. It's like what people often refer to as 'yam-vines.' They are connected somehow someway" (TW 03).

> "The mutual support group has created new social support networks for its members. In the past few years, group members have been walking side-by-side and comforted each other" (TW 11).

> "… group members provide psychological and emotional support for each other…. mutual support, to comfort. …or find a way to help ..." (TW 13).

Resource Availability

Studies show that *resource availability* may promote disaster resilience. Generally speaking, resources consist of assistance from public as well as private sectors such as financial aid, food aid, in-kind commodities, emergency necessities, social services, donations, humanitarian services, medical services, even services from volunteers (Bellavita, 2008; Carpenter, Hodge & Pepe, 2008). After disaster, survivors often use available resources to solve problems. At this point, resource availability would improve their adaptation to new conditions and environment. In this study, *resource availability* was found to have positive impacts on *self-reliance*

as well as *disaster resilience*.

> "Survivors need to find out what and where available resources are. In order to quickly recover from the catastrophe, they must use those available resources wisely" (TW 13).

> "I often try to figure out what resources I have on hand that may help me overcome the challenges I am facing. I also pay attention to available community resources. When the challenge is beyond my control, I make good use of community resources" (TW 11).

> "… many survivors need final assistance or in-kind donations. I am glad that The Old Five Old Foundation is doing meals on wheels. This is a useful resource for those living-alone elders and people with disability" (TW 12).

> "Disaster response workers need to understand survivors' needs, available resources, the cultural context of local community, and the government's policies as well as their attitudes toward re-construction projects. And then, let the local residents do the work – construct their community as a disaster resistant community" (TW 06).

Discussions and Suggestions

The results indicate that *acceptance*, *governmental agencies, Hakka spirit*, *preparedness*, *resource availability*, *self-reliance*, *serving others, social support networks*, and *spirituality* have positive impacts on disaster resilience. Participants affirm the importance of government involvement. They also emphasize the importance of understanding culture and meanings to the local people.

A hillside township like Tung Shih, a closed community is naturally formed. It may be easier for its residents to control their resources and re-establish social support networks. The outcome of this study has important implications for developing disaster resilience programs.

Due to the nature of the data and Taiwanese culture, a snowball sampling strategy was employed for this study. Even though the researcher had a good intention wanting to hear voices from different social economic statuses, four participants who belonged to the low-income category did not talk much about their stories related disaster resilience. In those interviews, their focus was on their daily struggle – how to

make ends meet. Because their resources are so limited that they have no extra means to set aside for disaster preparedness. Furthermore, because they are not used to talk in front of audio recorder, they may feel pressured to say something positive.

Compare to participants from the low-income category, participants from the teacher category seem to be more talkative. Because of their occupation and training, they are more knowledgeable in terms of community resources and disaster preparedness. They are more resourceful than participants from the low-income group. Those findings may imply that disaster preparedness requires resources and certain education. People from the higher SES group often enjoy more resources than their counterparts. Similar concerns often occur in disaster affected areas. Natural disasters often cause more damages to rural areas, where usually with limited resources, than urban areas. For survivors living in remote areas, promoting disaster resilience required information and resources may be scarce. It is often the case that they are uninformed about available resources, or lack transportation to relief centers. That implies that disaster response workers shall plan relief efforts carefully and wisely when working with survivors. They need to reach out to survivors in remote areas, to ensure that they are informed and have equal share of the relief materials. Coordinating relief efforts with the local government and/or other non-profit organizations would ensure that services reach to people in need.

Additionally, participants stressed that survivors need time, companionship, and the knowing that they are making progress. Disaster survivors are less likely to come to service providers, instead, service providers need to reach out to them. Outreach service is a more effective service delivery model for disaster survivors than others. Slaikeu (1990) and Myers (1994) have claimed that outreach approach works better than traditional methods.

Another potential disadvantage was that the language barrier and cultural differences could become a concern in terms of dictation and translation. Even though the researcher has hired bilingual student workers who were fluent in both Hakka and Mandarin or Minnanese and Mandarin to help with the transcription, the essence of certain Hakka language and Minnanese expressions might get lost in the process of translation. Further, being resilient did not mean that survivors did not experience difficulties or distress. Emotional pain and sadness are common in disaster survivors. Despite the fact that the purpose of this study was to examine disaster resilience, there was no intention to overlook survivors' emotional needs.

Some participants have suggested that residents in disaster-prone areas should have drills or similar training on coping with natural disasters, or be constantly reminded through media. Likewise, Rosenfeld, Caye, Ayalon, and Lahad (2005) point out that disaster education is an essential part of community preparedness. It aims at increasing public awareness of what can happen and at enhancing readiness to act according to the proposed disaster plan.

Moreover, participants commented on "one-stop shopping," which means all services are provided in one place. The "one-stop shopping" was first employed in Edmonton, Alberta in 1987. Because the Canadian government was so well prepared that within six hours of the 1987 tornado, all levels of the Canadian government joined forces with non-profit organizations as well as private sectors and established a service center at a school. In a single visit, disaster survivors received all the services they needed such as collecting car insurance, receiving emotional counseling, and so forth. In this study, participants commented that in and after the disaster, survivors would be busy with relocating family members, relatives, and friends. There would be thousands things waiting for them to deal with. It would be considered as a torture, if they have to rush into places such as governmental agency, insurance company, bank, and so forth in a timely manner. It would be very helpful if the local government would coordinate with related agencies to set up booths in one building to serve affected community members. In fact, the researcher found a mini one-stop shopping setting in Taitung shortly after the August 8 Flood. Representatives from local telephone company, post office, Household Registration Office, and more were working in the booths set in the relief center.

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