

It Takes a Community:

The Development of Disaster Resilient Communities in Taiwan

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Abstract

From the beginning of 21th century, the importance of community disaster prevention and rescue issues is growing rapidly in Taiwanese local government public policy agenda setting. Taiwan is vulnerable to many natural and man-made disasters like typhoon, earthquake, flood, air pollution, etc. Huge life and property loss result from disasters stimulates Taiwanese government taking actions to enhance the social resilience to disaster threats. As the basic level of local governance system in Taiwan, communities play the crucial role in determining the successfulness of emergency management policy execution. In recent decade, efforts have been made by both the central and local government to build “disaster-resistant community” as a critical emergency management policy. By what means do the disaster-resistant communities are built in Taiwan? Does such policy achieve its expected goal? What can be enhanced to increase community’s disaster resilience? All these questions are key issues in enhancing Taiwanese disaster resilience.

Since the concept of community resilience has been introduced as the core idea in Taiwanese disaster-resistant community development, after reviewing the history of development, policy outcomes are analyzed by the concept of resilience. Then, the relationships between local government, community organizations, local dwellers, and

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other participants (such as the private sector, higher education institutions, etc.) in the local disaster response network are analyzed as well to see what can be enhanced to enhance community resilience to disaster threats.

By learning experiences abroad, a framework which includes disaster response education and plan making has been set up as the guidance in creating Taiwanese disaster-resistant communities. However, the formalism within plan making (especially the standard operation plan, SOP) and policy execution limits the community's disaster resilience. A sustainable cooperation relationship between the public sector and other local participants and the resilience of local government agencies to disasters can be viewed as the "missing links" in enhancing community resilience to disasters in Taiwan. In order to solve the problems observed in the existing experiences, a comprehensive vulnerability management model is suggested as the new approach to replace the disaster-resistant community model to create a "disaster resilient community" in Taiwan.

Introduction

Located in East Asia, Taiwan (ROC) is facing highest disaster threats from natural disasters like typhoon, earthquake and mudslide in the world (Lin 2008; Tso and McEntire 2011). Taiwanese emergency management system is created and enhanced based on experiences in disaster responding. A hierarchical disaster response and recovery network in which a four tier system (the central, municipal, county/city, and township/district) plays the major role of disaster policy making and execution. As the basic level of Taiwanese emergency management system, township/district mayors usually work with local fire department chiefs as the first respondent leaders. In recent years, with the trend of community development (or community empowerment),

communities have become an essential actor in local emergency management affairs to work with government officials and other participants (such as NGOs, for-profit organizations, etc.). Experiences learning from huge disaster attacks such as the 9/21 Chi-Chi Earthquake, Typhoon Nari and the 8/8 Flood (Typhoon Morakot) not only arouse people's concern but also trigger more governmental actions toward building disaster resilient communities as a critical policy tool to enhance Taiwanese people's resilience to disasters. With the enhancement of local people participation in community affairs, more local governance activities could be made to reduce governing costs. Having similar values and needs toward local affairs, community engagement has become a critical factor in local emergency management policy execution (O'Neill 2004; Webber et al. 2017). Social networks within communities may foster residents' ability to well responding to disaster attack (SCDC 2011; Chou and Wu 2014; Chang and Dai 2016). Within the public policy making process, the possible effects from different stakeholders (government officials, legislatives, citizens, interest groups, etc.) may have significant impacts on the policy making quality or execution efficiency. In community disaster response, stakeholders may include, but not limited to the public sector, NGOs, local businesses, other emergency service providers (such as medical service providers) and local residents (Webber et al. 2017). The importance of community in local emergency management affairs is gaining more attraction by both the public sector and scholars.

In the process of disaster-resistant community development, Taiwanese government borrowing ideas from not only domestic but also foreign experiences. The concept of community resilience has been widely used as a core idea to improve local governments' ability to prepare and to respond to disasters (Norris et al. 2008; Jung 2016).

In this research, the concept of community resilience is used to help answer

questions such as by what means do the disaster-resistant communities are built in Taiwan, does such policy achieve its expected goal, and what can be enhanced to increase community's disaster resilience with evidences observed in recent years. Suggestions about what are possible ways to build a community with high disaster resilience (the disaster resilient community) are offered.

Community disaster resilience

The concept of resilience is multidimensional which can be used in different social contexts (Lee et al. 2013; Atreya and Kunreuther 2016). A common meaning is the system's (or organization, individual, group, etc.) ability to bounce back to its normal condition from any interruptions (CARRI 2013; Jung 2016). In a short-term perspective, the concept of resilience focuses on maintaining the lowest operation ability; in the long term, the focus turns to the ability of total recovering from the normal condition before interruptions or attacks (Li 2016).

From academia, the concept of resilience can be use or analyzed in six levels: physical, ecological system, individual, community, city and social. Key words relating to the resilience in these levels are: bounce back, adaptation, recovery from mitigate, deal with, return to equilibrium, etc. (Dalziell and McManus 2004; Norris et al. 2008; Seville 2008; Lee et al. 2013; Eachus 2014;Atreya and Kunreuther 2016; Jung 2016; Li 2016). In the discussion about community resilience to disaster, building a network to connect community residents to participate in collective actions for risk reduction is the key issue (Norris et al. 2008; Gissing et al. 2017). In the community disaster response network, all the stakeholders includes residents, NGOs, government officials, for-profit organizations, may have equal importance and responsibility to enhance community resilience to

disaster. A community with high disaster resilience may help disadvantaged community residents build their individual (or collective) resilience to cope with disaster risks and challenges (SCDC 2011). However, a collection of resilient individuals may not inevitably form a resilient community (Norris et al. 2008). It requires all stakeholders (individual, organization, etc.) are resilient to disasters to guarantee a high community resilience. In other words, it not only takes whole community members but also relating (or neighboring) individuals or groups' efforts to lower risks and threats from disaster attack. Thus, all the stakeholders' resilience are equal important in determining the community resilience to disasters.

History of Taiwanese disaster-resistant community

In 1994, Taiwanese central government started the so called “community building projects (社區總體營造計畫)” which aim at enhancing surrounding environment and finding local culture to encourage residents participating in community affairs. After decades, fruitful achievements have been made through the bottom-up approach adopted by communities. The original target of such project is to foster Taiwanese local communities began to create their own cultural characteristics based on historical, environmental, and cultural aspects, as well as community memories. However, in the community building process, not only cultural characteristics but also a common identity could be created. With the growing of community identity, more and more people are willing to spend time in community affairs. Learning experiences abroad, Taiwanese government began to promote disaster resilience activities in community level.

The Office of National Science and Technology Center for Disaster Reduction is created in 1997 as the central agency which directed national emergency management

research. When the concept of disaster-resilient community is introduced to Taiwan, this office took the task of directing community disaster resilience research and education programs. In 2003, the Office was reorganized as National Science and Technology Center for Disaster Reduction (NCDR). From now on, this center has worked with relating central bureaus (Council of Agriculture, Water Resource Agency, and National Fire Agency) to promote more disaster-resistant community research projects in Taiwan. 12 urban and rural Taiwanese communities have been certified as the “Disaster-resistant Community” in which community residents may have successfully reduce the disaster risks and increase the resilience to natural disasters.

The 9/21 Chi-Chi Earthquake in 1999 which brought tremendous demolition in central Taiwan arouses a widely public concern toward the need to deepen emergency management actions into local areas. In the same year, a research team led by National Taiwan University (NTU) began a community disaster response education program in two communities which had been attacked by mudslide in Taipei City. Using workshops to unite and to educate community members, NTU research team successfully made a community disaster response and education plan for the target communities. Such experience has become the model to be widely used by other local government or research team sponsored by Taiwanese central government as the main strategy in promoting community disaster response affairs (Wu and Kang 2007).

In 2002, the “Integrated Community-Based Disaster Management (CBDM)” program was inaugurated by the Executive Yuan (the Cabinet in Taiwan) in 10 selected urban or rural communities that located in mudslide-prone areas. Professionals from the public sector and academia (research teams from 5 national universities in Taiwan) work with community groups to teach people how to well respond to natural hazards (Wu and

Kang 2007). In the review of CBDM program, scholars find out that communities' ability to have a consensus about the importance of disaster response will determine the effect of the education program. Lacking a united command and control system in community disaster response also limits the education program's execution performance (Chen et al. 2002; Wu and Kang 2007; Chou and Wu 2014). Having a strong partnership which integrates government, community, and other policy stakeholders is another crucial factor determines the quality of community disaster response (Paton and Johnston 2001; Newport and Jawahar 2003; Mimaki and Shaw 2007; Wu and Kang 2007; Huang et al. 2011; Lopez-Marrero and Tschakert 2011; McGee 2011; Wilson 2013; Chou and Wu 2014; Jung 2016; Webber et al. 2017).

The "Six Star Project" by the Executive Yuan from 2005 to 2008 focused on the development of modern "health" community in which all residents will have a safer (e.g. less disaster risks), healthier (e.g. high quality health service), and better living environment. Creating a disaster resilient community has been introduced as a target of increasing the safety of modern Taiwanese community. The Typhoon Morakot in 2009 caused serious damage to southern Taiwan. The execution performance of disaster-resistant community in Taiwan was strictly examined by the natural disaster. In some communities that already created a strong disaster response partnership, facing serious damage brought by disaster, local people could take necessary actions to lower the possible human life and property loss immediately. After the disaster, such communities also could have a better efficiency in disaster recovery works and have better experiences in enhancing the community resilience for the future disaster threats (Tsai 2011).

The most seriously damaged population by Typhoon Morakot in 2009 is who lived

in the mountainous area in southern Taiwan. The Xiaolin Village was destroyed by heavy rains and mudslide, 461 people passed away and 192 others are still missing. The Xiaolin tragedy has triggered public concern of disaster resilience issues in local communities. It also result in the central government's emergency management institutional reforms, the Office of Disaster Management (ODM) has been created in the Executive Yuan to take charge of overseeing and implementing emergency management relating policies and actions (Tso and McEntire 2011). The Ministry of Science and Technology is assigned more budget to encourage community disaster resilience researches. The NCDR is granted by the central government to establish more disaster-resistant communities. After receiving the application from local community, a research team will be sent to help the community become a qualified disaster-resistant community. The major steps are: preparing for policy execution, data collection (includes environment investigation vulnerability and risk identification), analyzing disaster risks and vulnerability, establishing community disaster response teams, making disaster response plans (or standard operating procedure, SOPs), community education (discussing with community members about the disaster threats, plans, etc. to let community members know how to well respond to disasters), and policy evaluation (Chou and Wu 2014; Chang and Dai 2016).

Discussion

Having a high community resilience will demonstrate local government's active roles and success in promoting the society's ability to disaster response (Tidball et al. 2010). Both Taiwanese central and local government have devoted to actions help to enhance community resilience. Although the central government makes great resource

inputs in community disaster resilience construction works, several problems are identified as barriers to enhance Taiwanese disaster response activities.

1. Lacking resources in policy continuation: lacking enough financial and human resources seriously limits local communities' disaster response. Most of communities rely on county or city government's aids to maintain community disaster response works (Wu and Kang 2007; Tso and McEntire 2011; Chang and Dai 2016). Only a few (12) communities have been certified as "disaster-resistant community" in Taiwan. Communities in which are working in enhancing disaster resilience are guided by research teams from higher education institutions or NGOs. When the research project is finished, many of local communities may not have enough resources to continue the emergency management operation (Chang and Dai 2016). Several communities are forced to stop or to reduce disaster preparedness activities because the financial aid is reduced or stopped. For example, several communities stopped their disaster preparedness works at the end of CBDM in 2002 (Wu and Kang 2007). The financial asymmetry problems force local governments to rely on central agency's aid (Tso and McEntire 2011). Even though it also creates opportunities to encourage the establishment of horizontal cooperation with neighboring local governments to jointly dealing with disaster management issues. Without having external supporting such as the legal legitimacy,² the success of such cooperation is heavy relied on local government leaders' willingness or acknowledgement toward disaster resilience issues.

² A central level legislation about local governmental cooperation is still lack in Taiwan. Most of such cooperation is created (and maintained) based on the personal will of local leaders. Affected by party competition, when the leaders are changed, the new leader (especially when he or she belongs to different parties) may have less incentives to maintain the cooperation. More discussions see Liu and Hsu (2011).

2. Goal displacement: local government officials encourage communities to apply for the counselling services by research teams funded by the central government to be certified as another disaster-resistant community. However, in some communities, local leaders or residents may criticize that the government officials may not fully understand the meaning of promoting disaster-resistant community (Chang 2014). Such policy should be focuses on the enhancement of community's resilience to disaster risks, not just follow the criteria to pursue the title. Making matters worse, the disaster preparedness and response activities have been adopted as a significant and required subject in the annually governmental performance assessment. Local officials have to fight with the financial crisis problem and try to get a better grade in the routine assessment at the same time. Pursuing a disaster-resistant community thus bring more negative impacts on local officials and community leaders to make such policy out of the right track.
3. Using the up-down, not bottom-up approach: when a local community is willing to become the next disaster-resistant community in Taiwan, the community leaders (community organization or village leader) have send their application to the central government. When the application is approved, a research team sponsored by the central government will be sent to the community to make a disaster response plan and to teach community members how to exercise the plan. The community is guided and educated by the research team. After finishing all the required works guided by the research team, the community will be recognized by the central government as another "disaster-resistant community" in Taiwan. And all the information and data relating to community

disaster response affairs will be filed by the central government for the future policy evaluation or other use. In forming the disaster-resistant communities, two models are often used as the major discipline (Chang and Dai 2016): the “guided participation” model, which the central government (or the research team) keeps most of power in policy (disaster plan) making, is frequently used by Taiwanese government. In this model, community members may have opportunities to discuss with the research team in plan making process, however, in many cases, the community just need to follow the plans and directions from the research team or central government. In the “people-centered participation” model, community members may have more decision making power through a bottom-up approach to cooperate with other policy stakeholders (the public sector is included) to join in the community disaster plan making. Taiwanese government may focus more on the command and control in community disaster response affairs (Wu and Kang 2007). Such phenomenon may result from the fact that most of local governments still have to rely on the central government’s aids in local emergency management affairs. With more relying on central government’s budget, more control from the central is required to assure the local government’s actions will reach the central’s policy goal. With the increased control from the upper level government, the community may lose opportunities to create its own particular disaster response policy based on the local characteristics. If the bottom-up approach is used instead, it may help to decrease the central government’s additional costs in overseeing the policy execution.

4. Emphasizes on plan making and community education, ignores finding out

possible stakeholders to create a more comprehensive disaster response partnership: in the recent experiences, in order to establish a disaster-resistant community, many efforts are made in performing disaster education on local residents. Although creating partnership with possible local stakeholders such as NGOs, community organizations, religious groups, etc. is listed in disaster-resistant community guidelines (Chang and Dai 2016), after reviewing the case studies of Taiwanese disaster-resistant community, we may find that many local stakeholders such as religious groups and for-profit organizations are still missed in the local disaster reduction works. The importance of such actors has become a missing link in Taiwanese disaster-resistant community model.

5. Problems within the disaster-resistant community model: in the Taiwanese case, we may find out a most significant characteristic within the community emergency management policy: the core value is to pursue a disaster-resistant community. The means of disaster-resistant community is to help communities minimize natural disaster threats by maximizing the techniques of mitigation works (Geis 2000; McEntire 2002). However, in recent years we may find that the climate change has become an irreversible reality. The range and threats of disasters brought by severe weather has been increased. We may not make our community totally resistant to disasters. Instead we should think how to recover as soon as possible from the disaster attack. Thus the concept of disaster resilience has been widely adopted in global emergency management affairs. Some scholars find out the model of disaster-resistant community may pay too much attention on natural disasters to consider critical factors such as social and civil environment settings, disaster-relating academic disciplines (e.g. public

administration, psychology, economics, etc.), and participants like emergency managers, first responders, officials and the NPOs (McEntire et al. 2002).

6. Ignoring the problem within participating organizations, especially the public sector: much of community disaster response research focus on how the community respond to disasters, but few of them discuss about how organizations in communities respond to disasters. Both community and organizations within have equal importance in responding to disasters. All the stakeholders' disaster resilience will have impacts on the disaster response and recovery works. After the Tohoku Earthquake in Japan, 2011, when the government office and local fire department buildings were destroyed, their connection to their superior (the prefectural level) had been cut. Thus the Japanese central and prefectural governments could not get enough information from disaster areas to make decisions (Mimura et al. 2011). Without having information from the disaster area, both central and local government officials could not take necessary disaster response actions. The low organization disaster resilience in Japanese public sector caused a serious delay in disaster rescue and response actions thus many disaster victims had to wait more than a week to receive necessary help from outside the disaster area. Scholars also indicate that not only public sector, but also other community organizations' resilience to disaster would be decreased when they no longer receive (or at least receive less) central government's financial aid when the disaster-resistant community project is finished (Wu and Kang 2007).

From the discussions above, we may find that the existing disaster-resistant community model may not help to solve the increasing disaster threats in Taiwan. In the

US, an alternative approach called “comprehensive vulnerability management” model could be used as another practical tool in enhancing Taiwanese community disaster resilience. This model includes holistic and integrated activities to diminish disaster risk and to build disaster resistance and resilience (McEntire et al. 2002). Comparing to the traditional disaster-resistant community model, the comprehensive vulnerability model have the following advantages (McEntire et al. 2002).

1. It relates to all types of factors that may result to disasters. A community may have vulnerability to natural or technological (such as weather change, biological hazards, chemical factory explosion, etc.) disasters due to the weakness within the disaster warning system, evacuation plans, insufficient site security, etc. The comprehensive vulnerability model recognizes that different kinds of vulnerability are equal important and need actions to be taken for having a well preparation.
2. The comprehensive vulnerability model relates to four major functions of emergency management. It relates to mitigation, preparedness, response and recovery.
3. The critical stakeholders in disaster reduction are considered. Not only community residents but also the public sector, NGOs, for-profit organizations and other relating actors are considered in the model. Especially the public’s role in responding to disaster is highly valued. Community residents’ ability to work together to reduce the disaster risks is a key to reduce the community’s vulnerability to disaster.
4. A wide range of variables (or disciplines) are considered. Physical, social, economic, political, cultural, technological settings may have significant impacts

on disasters and community resilience. All the variables may affect community members' attitudes and actions toward disaster preparedness and responding. Thus all of these variables are equal important in disaster reduction activities.

5. It deals with organizational factors. The organizational resilience should be highly valued as another key factor in enhancing the Taiwanese community resilience to disasters for two reasons: first of all, the organizational resilience and community resilience are highly correlated, if all stakeholders have high organizational resilience, the community resilience will be enhanced as well (Dalziell and McManus 2004; Lee et al. 2013). Besides, having high organizational resilience will help to enhance the efficiency in community recovery works (McManus et al. 2008; Lee et al. 2013).

Having advantages listed above, Taiwanese government is suggested to use the comprehensive vulnerability model as the new approach in enhancing community disaster response ability. By adopting this model, both the public sector and the community stakeholders may work together to have a more comprehensive view toward all environmental (natural, social, economic, political, etc.) settings that may lead to disasters. The comprehensive vulnerability model also helps to create the collaboration between local stakeholders. With the bottom-up approach in which the community takes the major role in the local disaster response plan making will help to loose government burden and make the plan more close to local needs. Thus a disaster-resilient community will be created to have more ability to be totally recovered from disaster attacks and have more resilience to face the future disaster threats.

Conclusion

Taiwanese emergency management system is created and enhanced based on past experiences and learning from abroad. In the development of community resilience, however, the disaster-resistant community model may not fully help Taiwanese local community well respond to disasters. With the concept of resilience is widely used in global disaster management affairs, The comprehensive vulnerability model which focuses on the collaboration works and partnerships among all stakeholders such as residents, community organizations, NGOs, for-profit organizations, and the public sector to enhance community resilience is suggested as a new approach in Taiwanese local emergency management system.

Evidences within the development of community disaster resilience in recent decade have shown the importance of various inter-organizational collaboration between community stakeholders (Jung 2016). The stakeholders' organizational resilience may have significant impacts on the community's resilience (Lee et al. 2013). In Taiwan, lacking emphasis on organizational resilience (especially on the public sector) is a critical problem which limits the efficiency of community disaster response and recovery activities. Since the financial problem still poses a great threat to Taiwanese local government to establish a well-designed and executed community disaster response policy. How to acquire more resources from non-governmental providers has become another critical issue. Luckily, the non-governmental force has become a critical and powerful participant in Taiwanese emergency management system (Tso and McEntire 2011). NGOs and religious organizations may offer necessary financial, human resources and services in community disaster response affairs. Thus with the successful collaboration between different local stakeholders, a Taiwanese disaster resilient community will be created to have better resilience to disaster and less possible human

life or property loss from disaster attack. More observations and researches are needed to testify whether the new comprehensive vulnerability model will bring more advantages to Taiwanese community as it is expected. More efforts are needed as well to embed the culture of resilience in Taiwanese communities to increase the possibility of success.

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