

# การวิเคราะห์ระบบการจัดการภัยพิบัติในภาครัฐ ภาคประชาสังคม และองค์กรระหว่างประเทศ: กรณีของไต้หวัน

## An Analysis of Disaster Management Systems in the Government Civil Society and International Organizations: The Case of Taiwan

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### บทคัดย่อ

ไต้หวันได้เผชิญหน้ากับภัยพิบัติทางธรรมชาติจำนวนมากเนื่องจากสภาพแวดล้อมทางภูมิศาสตร์และธรณีวิทยามีลักษณะเฉพาะ รวมทั้งมีการใช้ประโยชน์จากธรรมชาติมากเกินไป จึงทำให้เกิดมลภาวะและการเปลี่ยนแปลงสภาพภูมิอากาศของโลกทำให้ภัยพิบัติที่รุนแรงมากขึ้นอย่างมีนัยสำคัญที่ก่อให้เกิดการสูญเสียชีวิตและทรัพย์สิน นอกเหนือจากรัฐบาลแล้ว ผู้มีบทบาทในการจัดการภัยพิบัติที่สำคัญ คือ องค์กรระหว่างประเทศและภาคประชาสังคมของไต้หวัน อย่างไรก็ตาม ระดับของการมีส่วนร่วมของตัวแสดงแต่ละตัวและบทบาทความเป็นผู้นำจะขึ้นอยู่กับสภาพความเป็นจริงทางการเมือง การศึกษาครั้งนี้พยายามประเมินการจัดการภัยพิบัติในไต้หวันในสามด้าน คือ (1) การทำความเข้าใจเรื่องความสัมพันธ์ระหว่างสิ่งแวดล้อมและการจัดการภัยพิบัติ, (2) การใช้ เหตุการณ์แผ่นดินไหวที่เกิดขึ้นเมื่อวันที่ 9 กันยายน ค.ศ. 1999 และพายุไต้ฝุ่นมรกตเป็นตัวอย่างในการประเมินระบบการจัดการ, และ (3) การมีปฏิสัมพันธ์ระหว่างผู้มีบทบาทในการจัดการภัยพิบัติ ผลการศึกษาพบว่าระบบการจัดการภัยพิบัติในไต้หวันมีความโดดเด่นด้วยระบบราชการแบบ Hydra-headed และ เนื่องจากการสื่อสารที่ไม่มีประสิทธิภาพระหว่างรัฐบาลกลาง รัฐบาลท้องถิ่นและองค์กรพัฒนาเอกชนขาดประสิทธิภาพ จึงทำให้องค์กรผู้มีส่วนร่วมในการจัดการช่วยเหลืออยู่ในลักษณะต่างคนต่างทำ จึงส่งผลให้สูญเสียกำลังคนและการแบ่งปันทรัพยากรอย่างมีประสิทธิภาพ ดังนั้น รัฐบาลควรเรียนรู้จากประสบการณ์ขององค์กรพัฒนาเอกชนที่ใช้การเชื่อมโยงแบบแนวนอน การรวมข้อมูลการช่วยเหลือทั้งแบบแนวดิ่งและแนวนอนเพื่อที่จะทำให้มีการใช้ทรัพยากรที่มีประสิทธิภาพมากขึ้น

**คำสำคัญ:** การจัดการภัยพิบัติ, แผ่นดินไหว 921, ไต้ฝุ่นมรกต

### Abstract

Taiwan has confronted many natural disasters due to its unique geographical and geological environment. Overexploitation, pollution, and global climate change have made disasters more severe, causing significant loss of life and property. Apart from the government, major disaster management actors include international organizations and civil society. However, the level of involvement of each actor and leadership roles are dependent on political realities. This study seeks to assess three dimensions of disaster management in Taiwan (1) clarifying the relationship between environmental and disaster management (2) using the 921 Earthquake and Typhoon Morakot as examples to evaluate current management systems and (3) identifying interactions among these major actors. The study finds that

disaster management systems in Taiwan are characterized by a hydra-headed bureaucracy. Due to poor communication between the central government, local governments, and NGOs, actors carry out rescue work individually, resulting in wasted manpower and inefficient distribution of resources. Therefore, it is suggested that the government learn from the experience of NGOs in making horizontal linkages, combining vertical and horizontal rescue information, to make more efficient use of resources.

**Keywords:** disaster management, 921 Earthquake, Typhoon Morakot

## Introduction

### Does Governance of Disaster Management Matter?

There is a growing belief that the government is not the only actor in disaster management. Instead, the government should work with civil society or NGOs on disaster relief and recovery. Disaster governance should enable stakeholder engagement and participation, taking joint responsibility for all stages of disaster management from prevention to reconstruction. Although there are several different accounts of the governance of disaster management, most strongly emphasize the processes of management, coordination, stakeholder dialogue and involvement, social learning, and inclusion in policy making (Hajer & Wagenaar, 2003).

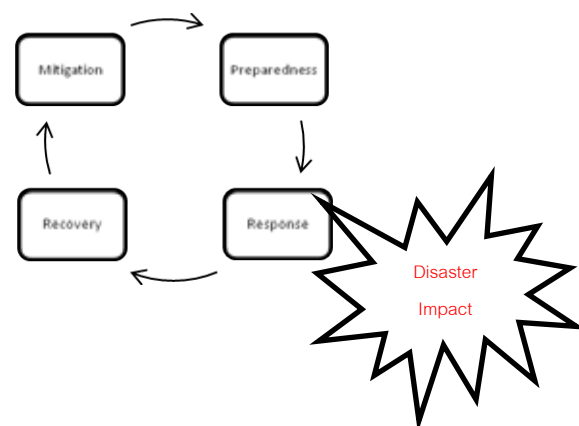
The United Nations defines a disaster as “a serious disruption of the functioning of a community or a society causing widespread human, material, economic and environmental losses which exceed the ability of the affected community/society to cope using its own resources” (UNISDR, 2015). Disasters result from the combination of hazard, vulnerability, and insufficient capacity or measures to reduce potential risk. Human activities often aggravate natural disasters. Taiwan, for example, has confronted several major

disasters in recent years. Some of them are man-made, such as plane crashes, fires, car accidents, and mine accidents. Others are natural, such as collapsed buildings following the 921 Earthquake (also known as the Chi-Chi Earthquake), landslides brought about by Typhoon Morakot, foot-and-mouth disease, floods, and tsunamis. However, it is also found in these disasters, human behavior was more determinative than natural factors. Therefore, we can identify two types of disaster. First, a disaster caused entirely by human activities such as global warming or climate change may be referred to as a “man-made disaster.” Second, a disaster caused by the natural environment, but increased the scale, frequency, and range by human activity may be referred to as a “man-induced disaster” (Huang, 2000).

Disasters occur when hazards and vulnerability coincide. The aftermath of a disaster requires an increased capacity from the individual, community, and government to face and solve the problem in order to reduce the impact of a hazard. In addition, in order to enhance its capacity, governments have established mechanisms referred to as “disaster management.” The purpose of disaster management is to reduce the uncertainty of disasters. Governance in disaster management focuses on sustained and dynamic management process. Therefore, disaster management

is a concept of governance that enables an organization or institution to achieve a desired, and potentially mission-critical, objective. The governance of disaster control aims to deliver the alignment, accountability, transparency, and compliance results desired by NGOs or the state. The governance of disaster control should be a structured processes, involving communication and management that allows key decisions to be reached and implemented. Simply put, the governance framework for disaster control must incorporate three components: decision structures, operating procedures, and collaboration mechanisms.

Type, time, prevention/recovery methods, and policy review are all involved in this concept of governance. Disaster management may be treated as the implementation of the governance framework, with its driving, linking, coordinating, and normalizing functions (Gibbon, Bair & Ponte, 2008). According to the U.S. Federal Emergency Management Agency, the governance of disaster management can be simply divided into four phases: mitigation, preparedness, response, and recovery. The four phases form a cyclical relationship (Figure 1). This means that if there are issues in an earlier phase, later phases will also be affected. “Prevention is better than cure” is good policy for disaster governance and management (Pearce, 2003). Therefore, the focus of disaster management governance has gradually shifted to mitigation work in recent years as the most effective approach.



**Figure 1** Four Phases of Disaster Management

### **The Governance of Managing the Relationship between Environment and Disaster**

In general, traditional risk or disaster management implies a top-down operational perspective which is highly reliant upon experts and a bureaucratic managers within the risk system. Yet, risk or disaster governance in democratic societies necessarily works from the bottom-up, and draws on stakeholders in civil society with their knowledge, experience, preferences, capabilities, and concerns. Community resilience is critical to disaster governance, and public participation is integrated into disaster management planning and community planning. As a result, the force of community resilience can achieve sustainable hazard mitigation and even disaster prevention (Pearce, 2003). Community resilience in disaster management and recovery is very helpful for the effective use and coordination of community resources. This also means that partnership building between the public and private sectors is crucial for disaster recovery (Kirmayer, 2009).

Disaster management is not confined to the level of the state; it is also an international concern. The

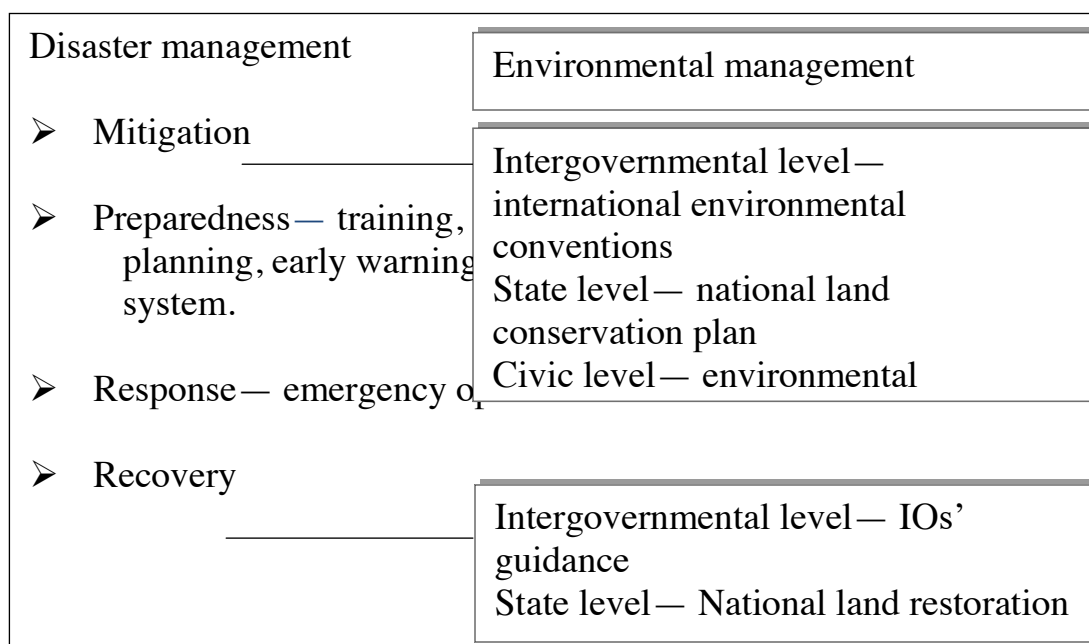
international community generally emphasizes environmental protection, relying on the efforts of all of humankind to reach the goal. However, environmental protection measures such as energy conservation and carbon reduction are pure public goods, meaning they are non-excludable and non-rivalrous. The free-rider problem causes the overuse of natural resources which accelerates environmental destruction. This is one of the reasons why international organizations must intervene in environmental management policy.

At present, governments are still the main actors in the international community, and it seems that globalization has not significantly benefited intergovernmental cooperation. The range and scale of intergovernmental cooperation in areas such as democracy promotion, humanitarian relief, human rights protection, cross-national labor, protection of refugees, international medical aid, disaster assistance, and environmental protection is very limited. The role of non-governmental organizations (NGOs) in assisting governments is critical. In other words, since the NGO sector can perform many functions that the government is unable to perform, its importance is obvious.

The United Nations defines an NGO as “a non-profit, voluntary citizens’ group which is organized on a local, national or international level.” Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bringing citizen concerns to governments, advocating and monitoring policies, and encouraging political participation through provision of information. They also provide analysis and expertise, serve as early warning mechanisms, and help monitor and implement international agreements (UNIC, 2015). NGOs are

perceived as people-oriented organizations created by individuals that operate independently from any form of government, and carry out activities beyond traditional official channels. In short, NGOs provide very important social capital. Policy performance can be improved through cooperation between NGOs and the government (Birkland, 2006).

This section aims to clarify the relationship between environmental protection and the governance of disaster management (Figure 2). Disaster management aims to address these problems. One method of disaster management, normally used in mitigation and recovery period, is environmental management. As mentioned earlier, we divide environmental management into three levels. In disaster mitigation period, (i) intergovernmental organizations set up an international convention and supervise its implementation; (ii) governments establish national environmental protection laws and national land conservation plans in order to save lives and property, and pursue sustainable development; and (iii) the task of environmental organizations is to supervise administration as well as to promote environmental consensus among citizens. During the recovery period, (i) international organizations such as the UNDP provide financial and staffing support, implementing environmentally sound rehabilitation of ecosystems; (ii) governments establish national land restoration plans in order to restore affected areas to statutory ecological or environmental standards; and (iii) local NGOs help residents plan land usage to ensure economic development can accompany environmentally sustainable development (Pearce, 2003) (Wisner, Blaikie, Cannon, & Davis, 2004).



**Figure 2** Connections between environmental management and disaster management

### Comparative Analysis of the Response Periods for the 921 Earthquake and Typhoon Morakot

Institutional constraints are the most important factor in environmental governance. North defines that constraints are devised as formal rules (constitutions, laws, property rights) and informal restraints (sanctions, taboos, customs, traditions, code of conduct), which usually contribute to the perpetuation of order and safety within a market or society (North, 1990). The degree to which constraints are effective is subject to varying circumstances, such as a government’s limited coercive force, a lack of organized state, or the presence of strong religious precept. This study here use North’s concepts as variables to measure actors’ behavior.

The outcome of the institutional influence on disaster management can be divided into three aspects—efficiency, justice, and communication and cooperation. Efficiency is important in the response

phase, because losses are related to government’s response speed. The faster the government reacts, the more people are able to survive. But efficiency should not be the target for the recovery phase. Government should take victims’ feelings as well as their expectations about community development seriously. Time is needed to discuss plans, and implementation requires consensus. Therefore, pursuit of efficiency during the recovery period will lead to undesirable results. Rather than efficiency, justice is a better way to evaluate the effect of governance.

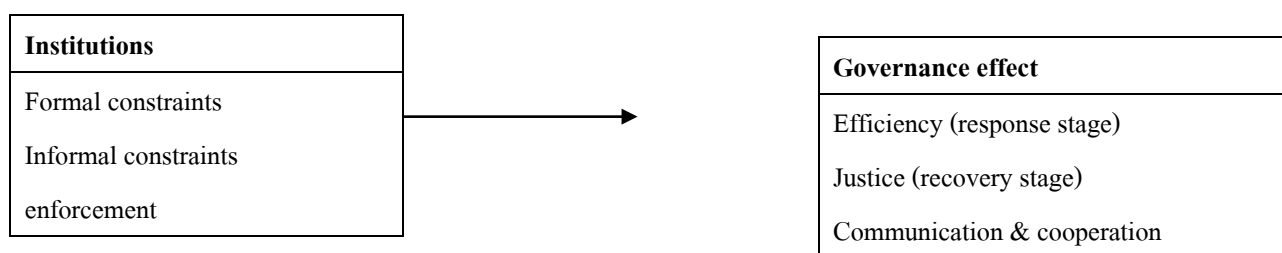
In terms of justice, Bryner (2002) identifies the following five issues for environmental justice: civil rights, distributive justice and ethics, public participation, social justice and ecological sustainability. During the response period, saving lives is the most important mission. So in this period, we ignore environmental justice. But when moving into the

recovery period, the government must integrate a social and environmental vision into its plans. Thus, Bryner's perspective on environmental justice is crucial. In this part we evaluate if the disaster victims are given fair compensation.

The goal of communication and cooperation is to achieve harmony in environmental governance.

Communication can be measured by the interaction between actors, while cooperation focuses on consensus

among actors about their objectives. Interaction between NGOs, central government, and local governments in the response period, and communication between victims, NGOs, central government, and local governments in recovery period both have a significant influence on the effect of governance.



**Figure 3** Conceptual framework

There are four steps for disaster management. To understand the effect of disaster management in Taiwan more accurately, we only focus on post-disaster response and recovery phases. In this study, the response phase occurs from the time of the disaster till six months after the disaster. The recovery phase may last from six months to between three and five years after the disaster, and in some cases even longer. The main tasks are public construction planning, industrial reconstruction planning, and planning for rebuilding lives and communities (Lin & Zhan, 2010).

In terms of formal constraints, there was no formal decree before the 921 Earthquake. Due to the scale of the disaster, the president granted central government the authority to carry out disaster relief by signing an Emergency Response Law. Following Typhoon

Morakot, the Executive Yuan quickly drafted “Typhoon Morakot Post-disaster Recovery Regulation” two weeks after the disaster. Comparing the two responses, the emergency decree was based on the central government (president) as the competent authority, enabling an urgent and rapid response, but possibly impacting human rights in the cases of abuses by the leader. In contract, disaster response laws are led by the Executive Yuan in cooperation with local governments, and are regular laws for long term implementation. In other words, they lack “extrajudicial alternatives” for dealing with emergencies. For example, following the 921 Earthquake, the central government was able to deploy the military as it saw necessary, while under disaster response laws, it must “apply” to deploy the military.

As for informal constraints, social capital (such as shared values, norms, networks and relationships, and trust) are vital for initial disaster relief. Following both the 921 Earthquake and Typhoon Morakot, transportation and communication systems were disrupted. In the case of the 921 Earthquake, faced with the large number and size of the disaster areas, the disaster relief resources that could be mobilized by the Nantou County government were limited. Therefore, the Nantou County magistrate used radio broadcasts to issue an appeal to the nation for the immediate donation of relief supplies such as drinking water, instant noodles, and tents. Within three days, these relief supplies had filled the Nantou County Sports Stadium.

Unlike the 921 Earthquake, Typhoon Morakot did not arrive without warning. Why then was there such a large loss of life even though everyone was aware of the approaching typhoon? Sociologists have shown that defending one's home rather than fleeing following a disaster warning is normal behavior. According to statistics, of the households who had left the disaster area, only around half of households received a notification to evacuate, while 44.8% evacuated before the disaster, and a further 55.2% evacuated only during or after the disaster (Lu, Chen, Chang, & Li, 2010). Fortunately, the disaster information platform developed by the nongovernmental sector enabled information on the disaster to be immediately logged, meaning that relief supplies could be quickly dispatched to the victims.

In terms of implementation, coordination failures in inter-governmental relations (IGR) are the main cause of the gap between policy and its

implementation. When the 921 Earthquake occurred, the central government was under Kuomintang (KMT) control, while the local government in the main disaster area, Nantou County, was controlled by the Democratic Progressive Party (DPP). Since both parties wanted to lead the disaster response, this resulted in significant overlap, reducing efficiency. Disaster victims saw very little in terms of outcomes from the central government. In response to stringent media criticism, the central government dispatched the deputy head of a central government body to the disaster area with command authority over the disaster area. However, central government officials were unfamiliar with the needs of the local population. Instead, the creation a separate parallel administrative system and deploying manpower for data collection and observing the relief effort risked creating further confusion (Tang, 2001).

For Typhoon Morakot, the performance of the government in its initial response was significantly inferior to enterprise organizations and non-profit organizations. This is because of administrative departmentalism. The response of each department to a crisis or major disaster is to use legal justifications to avoid tasks that are not under its jurisdiction. The lack of an integrated command structure between departments and simplified administrative processes means that disaster relief is constrained by a hydra-headed bureaucracy. During in-depth interviews carried out by Min-hsiu Chiang, a respondent mentioned that "For a long time, Taiwanese bureaucrats have done everything by following the rules. Some of them will try and avoid responsibility



when anything happens. This was very apparent during Typhoon Morakot” (Chiang et al., 2012).

In terms of efficiency, the central government’s response speed following the 921 Earthquake was quicker than after Typhoon Morakot. The 921 Earthquake occurred at 1:47AM and the epicenter was in Nantou County (magnitude 7). The army commander immediately issued a command for nearby military units to quickly move to the affected areas to carry out disaster rescue, and by 2:00 AM, the first military unit located near the disaster areas had already arrived. The military assessed the situation as a serious disaster covering a large area which would require the intervention of the military. Therefore, twenty minutes following the disaster, a disaster command center was established. In total, the military mobilized 460,000 soldiers for the rescue effort, making it largest rescue operation for the Taiwanese military in recent years.

During Typhoon Morakot, the military which played the main role in disaster relief following the 921 Earthquake was relegated to a passive role. Although military units stationed in the South were fully prepared, they had to wait for orders before starting disaster rescue work. Ultimately the optimum period for rescue had passed. Another factor was the refusal of foreign assistance. On August 11, the U.S. Department of State announced that it was ready to assist to Taiwan, but the Ministry of Foreign Affairs did not report this to the Central Disaster Response Center in accordance with operating procedures, and instead politely declined the offer of assistance. It was not until the administrative negligence was revealed in the media that the government started to accept

foreign assistance. Therefore, the arrival of four helicopters from the United States was delayed until August 17. The government was widely accused of an inadequate response to the disaster. As a direct result, the entire cabinet announced its resignation on September 10.

At the level of communication and cooperation, during the two crises, exchange of information and cooperation between the central government, local governments, and domestic and foreign rescue groups was insufficient, undermining the effectiveness of disaster relief work. Liu, et.al (2003) looks at the resource linkages between rescue organizations following the 921 Earthquake, and found that public sector organizations (such as the central government, military, police, and fire service) acted as detached organizations with very little sharing of resources. Despite its dominant position in allocation resources for disaster relief, the central government does not have wide scale interaction with local governments in terms of information and resource linkages. In fact, local governments and social welfare organizations have developed more two-way information linkages (such as human resources, and financial resources).

The rescue efforts following Typhoon Morakot also faced similar problems. Following the streamlining of the provincial government in 1998, the central government was only responsible for policy formulation and planning, and had very limited understanding of policy implementation. There were many blind spots in communication between the central government and local governments (in particular those in central and southern Taiwan). Of the local governments, the Kaohsiung City



government regularly organizes disaster relief meetings with civic organizations. In this way, the city government gained an understanding of the disaster rescue experience of non-profit organizations, and surveying the services they could provide in the event of a major disaster, establishing a disaster prevention network (Wu & Chao, 2010).

Looking at post-disaster recovery measures in each of the cases, we found that a lack of communication channels between central and local governments was a common problem behind the failure of relief efforts to meet expectations. In this case, why were relief efforts following the 921 Earthquake more effective than those following

Typhoon Morakot? We believe this can be explained by the different attitudes and governing styles of the central government regime when faced with a crisis. In the former case, the government took an active role, but in the latter case it was passive. Following the 921 Earthquake, the government took the initiative in directing rescue efforts to make up for the absence of a system for disaster relief. However, following Typhoon Morakot, although disaster response laws set out the tasks for each level of disaster response organization, due to the lack of regular disaster drills, and a mentality of passing the buck among disaster prevention authorities, the response of different bodies to the disaster was slow.

**Table 2***Comparison of Response Periods for 921 Earthquake and Typhoon Morakot*

	921 Earthquake	Typhoon Morakot
<b>Formal Constraints</b>	Emergency Response Law: 1. Urgent and rapid response 2. Flexible	Disaster Prevention and Protection Act: 1. Regular and long-term 2. More respect for human rights
<b>Informal constraints</b>	1. Obstacles to information flows 2. Rich social capital	1. Obstacles to information flows 2. Residents prefer to defend their homes 3. Establishing platform for integration of resources
<b>Enforcement</b>	Coordination failures between different levels of government	Coordination failures between different levels of government
<b>Governance effect</b>		
1. Efficiency	High	Low
2. Communication & cooperation	Weak linkages between central and local government Strong linkages between local governments and social welfare organizations	Weak linkages between central and local government Strong linkages between local governments and social welfare organizations
<b>Outcomes</b>	Central government able to respond in initial period, but coordination failures between levels of government undermined effectiveness disaster rescue efforts	Central government unable to respond in initial period, and poor relations between different levels of government delayed rescue efforts

### Comparative Analysis of the Recovery Periods for the 921 Earthquake and Typhoon Morakot

Next, we explore the post-disaster recovery stage. In terms of formal institutions, five months after the 921 Earthquake, the government announced the “Temporary Statute for 921 Earthquake

Reconstruction.” Article 5 of the Statute stipulated that local governments from the county to community level must form post-disaster reconstruction committees, establishing mechanisms allowing both local governments and disaster victims to participate in decision making. Representatives of disaster victims were able to get involved in reconstruction planning through participation in reconstruction committees, putting forward the views of disaster victims and ideas for reconstruction. Executive secretary of the 921 Earthquake Relief Foundation between 2000 and 2008 Tsai Pei-hui stated that the “Temporary Statute for 921 Earthquake Reconstruction” established mechanisms for local participation in reconstruction committees, allowing disaster victims to organize and collectively develop ideas for reconstruction and participate in recovery work (Summer, 2009).

After Typhoon Morakot, the central government was criticized for an inadequate rescue effort. In order to restore its image, twenty days after the disaster the Executive Yuan passed the “Post-Typhoon Morakot Reconstruction Special Act,” and approved a special budget 94 days after the disaster. However, this top-down thinking ignored the culture of Taiwan’s Aboriginal people, and reduced the opportunities for disaster victims to rebuild a sense of community cohesion through reconstruction (Lin, 2013). The Association for Taiwan Indigenous Peoples’ Policy believes that in the recovery stage, holistic understanding and communication is required. The hasty passage of the Act caused a second disaster for Aboriginal communities. Most importantly, aside from relocating villages, there was no conservation

policy, and previous mistakes for managing mountain areas and water control were repeated (TIPP, 2009).

Turning to informal institutions, when discussing reconstruction following the 921 Earthquake, the central government advocated reconstruction led by the community as a whole in order to obtain sustainable development, and the Council for Cultural Affairs invited civic groups to form a support teams, selecting sixty community service points to help affected communities rebuild. After Typhoon Morakot, various government departments developed reconstruction plans based on community building. However, the government lacked understanding of community building, and did not establish community centers in the disaster areas as was the case after the 921 Earthquake. Ultimately, instead of a dedicated community building program, the government only provided general subsidies to communities (Kuo, Chang, & Shen, 2012).

It should be also be pointed out that the composition of disaster victims was different for Typhoon Morakot and the 921 Earthquake. In Typhoon Morakot, Aboriginals made up 72% of the population in special areas and high-risk areas. However, when Aboriginal residents were relocated to permanent housing on the plains, they did not live together in the same configuration as their original communities. Instead, separated from their former neighbors, they found themselves in an alien situation. In the Great Love permanent housing community build by the Buddhist charity Tzu Chi, the Taoist religion of the Han people, Aboriginal Protestants and Catholics, and the Buddhism of the project builders Tzu Chi were forced together, causing friction.

At the operational level, local governments have a better understanding than the central government of the local environment and the needs of disaster victims. Furthermore, local governments have closer linkages with NGOs. Therefore, it is more appropriate for local governments to carry out reconstruction work. The institutional design for post-921 Earthquake reconstruction committees was like this from the start. However, with the pressure from elections due the next year, governments at different level competed for a leadership position in reconstruction planning. Different government bodies issued more than 200 contracts for reconstruction planning. Due to county and city governments' lack of fiscal and information transparency, the Reconstruction Council frequently skipped this layer of local government and issued orders directly to township governments. As a result, the county magistrates of Nantou and Taichung were extremely dissatisfied, and repeatedly resisted the central government's reconstruction policy (Lin, 2012).

The "principle-agent" problem also appeared in the recovery process following Typhoon Morakot. Since the central and local governments were under the control of different parties, there was the issue of attributing credit or blame for performance in the disaster recovery. Therefore, the central government used legal regulations to remove the powers of local governments over reconstruction, with the central government directly contracting NGOs to establish reconstruction centers. To resist the inappropriate actions of the central government, the Kaohsiung City government established its own reconstruction service centers. These overlapping units made disaster

victims unclear who to listen to, reducing efficiency and increasing costs.

In terms of justice, under political pressure from local interest groups, community groups, and related non-governmental organizations, meant that resources were directed toward compensation for losses and recovery of infrastructure. Reconstruction funds flowed to the most hazardous areas which were often also the most socioeconomically disadvantaged areas. Therefore, the allocation of resources for reconstruction also had a redistributive effect (Hung, 2007). Statistics produced by Lin (2012) two years after the disaster showed that post-disaster rescue and reconstruction did not significantly increase social inequality. In fact, after the payment of reconstruction subsidies, inequality narrowed slightly.

After Typhoon Morakot, reconstruction in the mountain areas produced more serious structural issues. First, although victims of Typhoon Morakot received significant social resources, these resources were mostly concentrated in households that chose offers of permanent housing. Eligible victims were given free permanent housing. According to the estimates of the Executive Yuan, the construction costs for each permanent house averaged \$NT4 million. Those who choose to rebuild their homes in their original location were only given \$NT40,000 per ping (about 3.3 square meters), with a ceiling of \$NT1.12 million (Lu, et.al, 2010). The second injustice was the contract signed between the government and disaster victims for the transfer of permanent housing units. One of the requirements was that the victims leave their place of origin and could not return to their original place of residence to live or

build a new house, under the threat of withdrawal of the permanent housing unit. This provision was a violation of human rights.

At the level of communication and cooperation, governments around the world choose to respect the self-determination of residents in respect of reconstruction. From this perspective, the main difference between the 921 Earthquake and Typhoon Morakot was in who led the reconstruction, and how this produced different relationships between the government and civic organizations. The reconstruction after the 921 Earthquake was led by the residents themselves who organized themselves into committees assisted by the government. Therefore, although victims following the 921 Earthquake did not obtain permanent housing at no cost, the government respected the rights to self-determination of the disaster victims, as well as bringing in NGOs and principles of community building. Under the supervision of NGOs, the relationship between government and residents was a more equal partnership.

After Typhoon Morakot, Tzu Chi lobbied the government on the advantages of “permanent housing.” The government was also interested in using the opportunity of permanent housing provided by NGOs to relocate residents living in high-risk mountain areas to assist the implementation of the land conservation policy. However, there were problems associated with this policy. First, because the efficiency of government-led relief work was valued over community resilience, some residents were forced to quickly decide on the type of reconstruction without understanding the proposed

reconstruction program, producing discontent toward the government among residents. Furthermore, the choice between permanent housing and reconstruction at the original location caused two conflicting factions to emerge within Aboriginal communities which was inconsistent with the purpose of reconstruction (Lu, et al., 2010).

In this case, why were relief efforts following the 921 Earthquake more effective than those following Typhoon Morakot? We argue that the level of involvement of the central government in the reconstruction is the main factor. The greater the intervention of the central government, the more likely that a gap with local needs emerges. Following the 921 Earthquake, the central government, local governments, NGOs, and groups organized by local residents worked together, successfully creating a new living space in many rural communities. However, in the case of Typhoon Morakot, policy leadership was in the hands of the central government. As a result, land conservation policy was prioritized over rebuilding communities. In addition, local governments with their understanding of the local area and its resources were excluded from the decision-making process, meaning that NGOs were unable to cooperate with local governments, and establish long term partnerships. As a result, the interests of many disaster victims were sacrificed.

**Table 3***Comparison of Recovery Periods for 921 Earthquake and Typhoon Morakot*

	921 Earthquake	Typhoon Morakot
<b>Formal constraints</b>	1. The Temporary Statute for 921 Earthquake Reconstruction established five months following disaster 2. County/city governments establish reconstruction service centers	1. "Post-Typhoon Morakot Reconstruction Special Act" established twenty days following disaster 2. Central government establishes reconstruction service centers
<b>Informal constraints</b>	Comprehensive community building to establish local cultural characteristics	Conflict between Aboriginal and mainstream cultures
<b>Enforcement</b>	Low	Low
<b>Governance effect</b>		
1. Justice	High	Low
2. Communication & cooperation	High	Low
<b>Outcomes</b>	Reconstruction takes longer, but disaster are more satisfied with their lives	Reconstruction is quicker, but disaster are less satisfied with their lives

**Conclusion**

The study finds that disaster management systems in Taiwan are characterized by a hydra-headed bureaucracy. Due to poor communication between the central government, local governments, and NGOs, actors carry out rescue work separately, resulting in wasted manpower and inefficient distribution of resources, and even delays to rescue operations. This was a significant problem in both cases, showing that Taiwan has still yet to learn from these two major disasters, and that rule of man is still more important than legal regulations.

This study also compared government approaches to disaster rescue and outcomes in the two cases. In the response phase, the need to issue immediate orders and for unified control, means that a top-down model produces greater efficiency. Taiwan's experiences following these two disasters demonstrates this. Since the central government could immediately issue commands following the 921 Earthquake, it was able to provide timely disaster relief. In contrast, the government was slower to react after Typhoon Morakot. During the recovery phase, since local governments have long term interaction

with local residents, they have a better understanding of the needs of disaster victims. Therefore, the disaster recovery decision making process should be primarily bottom-up. Taiwan's disaster relief experience also confirms this proposition. Following the 921 Earthquake, local governments held policy discretion, and could work with local communities to help people rebuild their lives. However, during Typhoon Morakot, the central government amended the law to monopolize decision-making power, meaning that recovery process was unable to meet the needs of victims.

Taiwan's NGOs are very active in the civil society, and have become famous for reaching disasters quickly and taking care of the area forgotten by government. This shows that NGOs have the ability to construct a systematic service platform, and to act as a bridge between residents and local governments. Therefore, this paper suggests legal revisions to integrate NGOs into the disaster relief system. In this way, the government can make use of the horizontal linkages of NGOs, combining vertical and horizontal rescue information to avoid the problem of hydra-headed rescue efforts and make more efficient use of resources.

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