

# Article

## **Disaster Politic, Law and Insurance in Climate Change Era: The Case of Taiwan**

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### ABSTRACT

*As climate-related disasters become more frequent and catastrophic, the capacity of disaster management system is under challenges. Scholars have put efforts on reforming disaster law, yet the impact of politics on disaster management is understated. This article takes Taiwan as a case to study how the disaster management system evolves with the interrelationships between disasters, politics, and law. This article suggests that Confucianism in the past authoritarian times had developed a paternalist disaster politics, which continually affects current operation of the disaster management system. Under the influence of paternalist politics, the state takes a primary role in disaster management without a sustainable financial mechanism, which renders citizens passive and indifferent. To better respond to climate change, this article integrates climate change adaptation to disaster management and proposes climate insurance to better distribute disaster risk and enhance the resilience of Taiwan amid a changing climate.*

**Keywords:** *Disaster Politics, Climate Change, Climate Insurance, Disaster Law, Adaptation*

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## I. INTRODUCTION

Although natural disasters can be understood as acts of God, disaster management and response is always political. Politics may contribute to the progress of disaster-related law and may also undermine the function of disaster management systems. The study of the dynamic interplay between law and politics with respect to disasters is crucial to improving disaster management systems; as climate change brings about more frequent and catastrophic disasters, management of disasters becomes ever more challenging. Key questions confronted herein are to what extent disaster management systems, influenced by politics, can address climate-related disasters and how legal mechanisms might be used to mitigate political uncertainty and enhance the resiliency of society faced with climate change-related catastrophes. In the face of climate change, when politics impedes the development of effective legal solution, whether private insurance may be provided as a solution to deal with losses and damages caused by climate-related disaster has become a question confronted by all policy-makers. While in countries such as the United States, where insurance has been more accepted as a technic to for risk-redistribution since their government take less role in disaster risk management,<sup>1</sup> does countries like Taiwan, whose government tend to take much significant role in disaster management, need climate insurance?

This article analyzes the interrelationships between disasters politics and law, and further study possible reform to enhance Taiwan's resilience against future climate-related disasters. This paper first examines the development of the modern disaster risk management system in Taiwan, and after assessing the social and political context, this article identifies a shift in political response to disaster from one of paternalism under the past authoritarian regime to a new politics of clientelism under democracy. This shift resulted in the establishment of a modern disaster management system in Taiwan. This article then presents Typhoon Morakot, which struck Taiwan in 2009, as a case to illustrate how politics undermined the function of the disaster management system and rendered it ineffective and unsustainable. Typhoon Morakot presents as one of the most catastrophic climate disasters in Taiwan. A study on the relief and reconstruction experience of Typhoon Morakot may better reveals the dynamics between law, politics, and the civil society. Because of climate change, disasters are set to increase significantly in the future, and the capacity of Taiwan's disaster management system will be accordingly challenged. This article argues that, climate insurance is

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1. See Stephen J. Collier, *Neoliberalism and Natural Disaster-Insurance as Political Technology of Catastrophe*, 7 J. CULTURAL ECON. 273, 273-90 (2014).

necessary for Taiwan because of its paternalist disaster legal system. The article further reviews the development of disaster-related insurance in Taiwan and proposes a catastrophe insurance scheme for implementation in the coming era of climate change.

## II. DISASTER POLITICS AND LAW IN TAIWAN

Traditionally, disasters were perceived to be natural accidents. When more disastrous events reflect human-induced problems, scholars started to study disasters from a cultural approach. Man-made disaster is perceived to be a culture fact, reflecting the technical, social, institutional and administrative arrangements of a society.<sup>2</sup> The cultural approach inquiries into the non-natural aspect of disasters, however, may under-estimate the complex social and political dynamics associate with a disaster. Recent studies on disasters discloses the relationship between politics and disasters.<sup>3</sup> On the one hand, disasters have the capacity to produce particular kind of politics. A disaster may demand extraordinary power and create an opportunity for different actors competing for power and resources. It can push the public to be more sensitive to criticism of response/relief efforts and alter their perception on political players. This approach takes disaster as empirical sites to understand politics.<sup>4</sup> By asking the political response, its actors and organizations and the decisions they take to answer to the event, this approach uses disasters to understand how the world is reorganized on multiple levels through and after disasters. Disasters have the potential to reshape the political regime and the composition of powers.<sup>5</sup> Response to disasters may mobilize broader violence, yet it may have extremely positive outcomes if the tension is recognized and handled well. On the other hand, politics may response to a disaster with its own purpose and therefore it may

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2. See, e.g., Barry Turner, *Safety Culture and Its Context*, in PROCEEDINGS OF THE INTERNATIONAL TOPICAL MEETING ON SAFETY CULTURE IN NUCLEAR INSTALLATIONS, 321, 321-29 (A. Carnino & G. Weimann eds., 1995); Silvia Gherardi, *A Cultural Approach to Disasters*, 6 J. CONTINGENCIES & CRISIS. MGMT. 80, 80-83 (1998).

3. Some scholars have studied how individuals, communities, and states prepare for, respond to, and recover from catastrophes and crises. Some others have studied the interaction between disasters and the wider political context. See, e.g., DANIEL ALESCH, LUCY ARENDT & JAMES HOLLY, MANAGING FOR LONG-TERM COMMUNITY RECOVERY IN THE AFTERMATH OF DISASTER 31-54 (2009); P. Kubicek, *The Earthquake, Civil Society and Political Change in Turkey: Assessment and Comparison with Eastern Europe*, 50 POL. STUD. 761, 761-78 (2002); B. Latour, *Turning Around Politics: A Note on Gerard de Vries*, 37 SOC. STUD. SCI. 811, 811-20 (2007).

4. A. Oliver-Smith, *Theorizing Disasters: Nature, Power, and Culture*, in CATASTROPHE & CULTURE: THE ANTHROPOLOGY OF DISASTER 23, 23-47 (S. Hoffman & A. Oliver-Smith eds., 2002).

5. Michael Guggenheim, *Introduction: Disasters as Politics-Politics as Disasters*, 62 SOC. REV. 1, 1-16 (2014). See also T. A. BIRKLAND, AFTER DISASTER: AGENDA SETTING, PUBLIC POLICY, AND FOCUSING EVENTS 1-5 (1997); USAID, FOREIGN AID IN THE NATIONAL INTEREST: PROMOTING FREEDOM, SECURITY AND OPPORTUNITY 105 (2002), [https://rmportal.net/library/content/higherlevel\\_fani/at\\_download/file](https://rmportal.net/library/content/higherlevel_fani/at_download/file) (last visited: May 21, 2020).

produce disasters or change the consequences.<sup>6</sup> Politicians may take the chance to maintain political power or to challenge their opponents by setting laws and institutions. A well-established disaster management system may reduce improper influence of politics and enhance the resilience of a society.<sup>7</sup>

This paper first studies the evolution of disaster law in Taiwan through a political approach, inquiring into the dynamics between disasters, politics and law. Under the authoritarian regime, disasters management in Taiwan provided the dictator an opportunity to maintain the hegemony through a politics of favors. The progress of democratization opened the opportunity for different political players to competing the power during disasters, eventually led to legislation of disaster law and a regime change. The current disaster law provides a more comprehensive framework for disaster risk management; however, a weak financial mechanism was left for the operation of the politics of favors.

#### A. *The Evolution of Disaster Politics and Law in Taiwan*

The modernization of disaster management system in Taiwan started since Japanese colonization. During the Japanese colonial periods (1897-1945), there were 177 typhoons attacking Taiwan. Interesting, Japanese government introduced mechanism from Japan to facilitated disaster management in Taiwan. They established an alert system, a relief organization consisted of policeman, fireman and civilians, they also provided relief for the people who encounter emergent difficulties after a typhoon. In addition, Japanese colonial government also set plans of priorities for rescue and relief. Despite the limited scale, Japanese government established a more organized, rule-based system that included disaster prevention and reconstruction in Taiwan during its colonial period.<sup>8</sup>

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6. Guggenheim, *supra* note 5, at 6.

7. Daniel Farber suggests that catastrophic events test the mettle of the legal structures and government programs charged with creating, preserving and rebuilding communities. Tang and Tsai studied the case of September 21 Earthquake and argued that, against the extreme scenario of a disaster, the risk-management system needs to distribute resource and inevitably involves power and private incentives and is political by nature. *See generally*, DANIEL A. FARBER ET AL., DISASTER LAW AND POLICY (3d ed. 2010); Ching-Ping Tang, Yun-Tung Tsai & Chi Huang (湯京平、蔡允棟與黃紀), *Zai Nan Yu Cheng Chi: Jiueyi Di Zhen Chung De Chi Ti Xing Wei Yu Zai Bian Qing Jing De Zhi Li* (災難與政治：九二一地震中的集體行為與災變情境的治理) [*Disasters and Politics: The Collective Behaviors and Emergency Governance in the Chi-Chi (Taiwan) Earthquake*], 16 CHENG CHI KE XUE LUN CONG (政治科學論叢) [TAIWAN JOURNAL OF POLITICAL SCIENCE] 137, 151 (2002).

8. Sheng-Chang Tsai (蔡昇璋), *Ri Zhi Shi Qi Taiwan Typhoon Zai Hai Yu Fang Jiu Cuo Shi* (日治時期臺灣的颱風災害與防救災措施) [*The Measures Adopted to Relieve and Prevent Typhoon Disasters in Taiwan During Japan-Ruling Period*], 60 TAIWAN WEN XIAN (台灣文獻) [TAIWAN HISTORICA] 253, 265-82 (2009).

These infrastructures and civic culture had paved the basis for the disaster risk management system after the de-colonized period.

The reconstruction of disaster risk management system after the Japanese colonial period were largely shaped by major disasters.<sup>9</sup> However, political authoritarianism had been used Confucianism as a rhetoric for its social control during the authoritarian regime (1945-1987)<sup>10</sup>. Disaster relief measures were seen more as a political mechanism for social control and validating the legitimacy of the political leaders.<sup>11</sup> Democratization since 1990 challenged the social control function of disaster management and turned it into an opportunity for political competition. Politicians competed to please voters by emphasizing more responsibility in disaster response and relief. Interestingly, vigorous political competition has contributed to a more comprehensive disaster management system, yet embodies the government's role of past paternalist thinking.

### 1. *From Social Control to Welfare State*

The earliest regulation concerning disaster relief was the executive order for disaster relief in 1948, which set standards for the allocation of food, money, and other material aid to disaster refugees. At the time, because of

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9. Pei-Shan Lin, Jing-Chein Lu & Tzu-Jeng Deng (林貝珊、盧鏡臣、鄧子正), *Tai Wan Jin Nian Zhon Da Zai Hai Ji Qi Dui Fang Jiu Zai Ti Xi Ying Xiang Hui Gu* (台灣近年重大災害及其對防救災體系影響回顧) [A Review of Recent Major Disasters and Their Impacts on the Disaster Management System in Taiwan], in SHUI BIAN-JING CHA KE JI XUE YUAN BA SHI ZHOU NIAN XIAO QING ZHUAN SHU (蛻變—警察科技學院80週年校慶專書) [METAMORPHOSIS-POLICE ACADEMY OF SCIENCE AND TECHNOLOGY 80TH ANNIVERSARY BOOK] 1, 6-7 (2016).

10. According to Farh and Cheng, in traditional Confucian ethics, the paternalism of the leaders and the obedience of subordinates constitutes Confucian reciprocity. Leaders are expected to display control and authority by setting rules, determining responsibilities, and issuing punishment and rewards, while subordinates obey their supervisors, benevolence is granted in exchange. See Yun-Shing Chen (陳運星), *Cóng Mǐn Běn Dào Mǐn Zhǔ Rú Jiā Zhèng Zhì Wén Huà De Zài Shēng* (從民本到民主：儒家政治文化的再生) [From Humanism to Democracy: A Study of the Renovation of Political Culture of Confucianism], 12 *ZHONG SHAN REN WEN SHE HUI KE XUE QI KAN* (中山人文社會期刊) [JOURNAL OF SOCIAL SCIENCE AND PHILOSOPHY] 87, 100-104 (2005); Shelton Appleton, *Survey Research on Taiwan*, 40 *PUB. OPINION Q.* 468, 468-81 (1978). See also, J. L. Farh, B. S. Cheng, L. F. Chou & X. P. Chu, *Authority and Benevolence: Employees Responses to Paternalistic Leadership in China*, in *CHINA'S DOMESTIC PRIVATE FIRMS: MULTIDISCIPLINARY PERSPECTIVES ON MANAGEMENT AND PERFORMANCE* 230, 230-60 (A. S. Tsui, Y. Bian, & L. Cheng eds., 2006).

11. When the Nationalist Party (Kuomintang, KMT) government relocated in Taiwan in 1949 after its civil war against Communists Party, KMT implemented authoritarian measures in Taiwan. After the 1980s, the government revoked martial law and held national elections for representatives to the central government. Under the authoritarian regime, Confucianism was used to maintain the authority of political leaders. Yet, Confucian values also suggested that superiors should be good parents and take care of their people. See JOEL S. FETZER & J. CHRISTOPHER SOPER, *CONFUCIANISM, DEMOCRATIZATION, AND HUMAN RIGHTS IN TAIWAN* 1-17 (2013); see also *Law in Political Transitions: Lessons from East Asia and the Road Ahead: Hearing Before the Congressional-Executive Commission on China*, 109th Cong. 12 (2005) (statement of John Fuh-Sheng Hsieh, Professor of Political Science, University of South Carolina).

the poor and highly regulated society, people lacked the ability to engage in disaster reconstruction and relied on the government for relief and reconstruction. To establish a procedure for later disaster relief efforts, the former Taiwan Provincial Government promulgated a Standard Procedure for Natural Disaster Assistance (SPNDA) after the 1964 Paiho Earthquake and implemented the first system for disaster risk management in 1965.<sup>12</sup> The SPNDA focused on search and rescue, social assistance and established a task force style organization in which the military and police were still the major responders during emergencies.<sup>13</sup>

From 1965 to 1990, Taiwan was devoted to economic growth but remained conservative politically. The advancement of the economy and technological innovation increased Taiwan's capacity to predict disasters and also made disaster-related information available to civil society. Because of the dissemination of disaster-related images on television news, disasters readily draw public attention and engender strong feelings such as fear, sorrow, sympathy, and anger. Yet, public awareness of disasters did not immediately lapse into recriminations against the government.<sup>14</sup> In response to emotional public during the disasters, authoritarian leaders exhibited acts of benevolence and thereby increased their social control, which was also supported by the traditional culture of paternalism. Former President Chiang Ching-kuo (1975-1988) often appeared on TV with his shirtsleeves rolled up to convey an image of being in the trenches with the people and being highly sensitive to people's sufferings. People thus perceived him as a savior, and he was therefore able to consolidate his political power. In addition, because the central government held a monopoly on resources, it also used relief and reconstruction aid as a tool to stifle local political opposition by threatening to withdraw aid. Because of the government's popularity, social control could be maintained even under extraordinary stress. Consistent with the traditional ideal of paternalistic government, conveying the image of a "good parent" had the power to transform possible outrage into political support and was leveraged to further consolidate the power of authoritarian leaders.

Democratization in the 1990s changed the scenario. Democratization reconstructed political opportunity and posed a challenge to the dominant holders of political power. In the process of early democratization, President Lee Teng-hui soon found a strong competitor, the Governor of Taiwan Province, James Soong Chu-Yu, who was also a leader of the Kuomintang

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12. The 1964 Paiho earthquake occurred on 18 January in Paiho Township of Tainan County, Taiwan. The earthquake killed 106 people, destroyed 10,924 buildings, and was labeled as one of the greatest earthquakes in the history of Taiwan.

13. See Liang-Chung Chen, Jie-Ying Wu & Mei-Ju Lai, *The Evolution of the Natural Disaster Management System in Taiwan*, 29 J. CHI. INST. ENGINEER 633, 633-38 (2006).

14. *Id.* at 633-35.

(KMT). Governor Soong frequently visited disaster-stricken areas in the aftermath of disasters. With the deep sympathy he expressed and the power to distribute provincial resources for relief and reconstruction efforts, Soong earned strong popularity and represented a threat to the power of the incumbent President Lee. Their competition for political power involved wielding disaster policy as a lever for attaining political power. Political leaders and political parties competed to please voters and sought to display great benevolence and generosity in response to disasters. Politicians who failed to do were subjected to severe political attacks, whereas voters rewarded the politicians who exhibited sympathy and were able to allocate considerable resources to disaster relief. Consequently, the paternalistic character of disaster politics, which was a mechanism of social control under authoritarianism, was transformed into a means of political competition under democratization. One result is a disaster legal system assuming more responsibility of the government in disaster risk management.<sup>15</sup>

## 2. *From Political Favor to Public Policy*

Democratization also re-defined the disaster relief from an incidental political favor to issues of public policy that requires long-term planning.

The competition from Governor Soong prompted President Lee to demand the Executive Yuan to study policies to promote the government's capacity for disaster relief. In 1994 the Executive Yuan passed the Programs for Disaster Relief, which included the National Hazard Mitigation Program (NHMP) that established a Disaster Prevention and Response Council (DPRC) task force under normal conditions as well as Emergency Operation Centers. The NHMP also required the formulation of plans, namely the Disaster Prevention and Response Basic Plan, the Disaster Prevention and Response Operational Plan, and Local Disaster Prevention and Response Plans.<sup>16</sup> Although democratization makes disaster management a matter of policy rather than political favor, NHMP remained a policy agenda without binding legal effects.

At the end of Lee's presidency, the KMT chose Lien Chan as the candidate for next presidential election. Soong then left the KMT and ran for the presidency independently. The major opposition party, the Democratic Progressive Party (DPP), named Chen Shui-bian as its candidate. A

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15. See CHRISTIAN ASPALTER, DEMOCRATIZATION AND WELFARE STATE DEVELOPMENT IN TAIWAN 171 (2002); see also, Christian Aspalter, *Welfare State System Development In Taiwan: The Causal Determinants of The Past and the Future* (Taiwan Insight, Aug. 20, 2020), <https://taiwaninsight.org/2020/08/20/welfare-state-system-development-in-taiwan-the-causal-determinants-of-the-past-and-the-future/>.

16. Chen, Wu & Lai, *supra* note 13, at 634.

catastrophic earthquake struck on September 21, 1999, causing 2,417 deaths and injuring more than 10,000 individuals. At the time of this unprecedented disaster, Taiwan had evolved into a relatively democratic society. This disaster presented a major opportunity for the opposite party to challenge the rule of the KMT.<sup>17</sup> In the presidential election of 2000, Soong siphoned off a considerable number of votes that would otherwise have gone to the KMT candidate and therefore contributed to Chen Shui-Bian winning the election. This election represented the first transition of power between parties subsequent to democratization. At the same time, the outcry of civil society for a law to manage disasters provided a strong incentive for the Legislative Yuan to make laws governing disaster management. The Disaster Prevention and Protection Act (hereinafter, the DPRA) was enacted in 2000 and provided a binding legal framework for natural disaster management for the first time in Taiwan's history.<sup>18</sup> When a failure revealed in a disaster, it triggered democratic politics to discuss and reform the DPRA correspondingly.<sup>19</sup>

These developments reflect the close interactions between disasters, politics, and legal change. In Taiwan, the ability to manage disasters has become an important source of a government's popularity and legitimacy. To be popular, the government must adopt the dominant role in disaster relief, aid, and reconstruction. This politics of government favors for popular support has contributed to legal change and the establishment of a relatively modern disaster management system. Democratization has also contributed to the resilience of Taiwan's society against disasters because its embodied value of human right cultivates civic virtue, with which people are more willing to provide help for their fellow citizens in an emergency.<sup>20</sup> Although

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17. The debate on political accountability during the 921 Earthquake, please see Tang, Tsai & Huang, *supra* note 7, at 144-62.

18. The Zai Hai Fang Jiu Fa (災害防救法) [Disaster Prevention and Rescue Act] (hereinafter, DPRA) has 8 chapters: 1) General Principles, 2) Disaster Organization, 3) Plan of Disaster Prevention and Protection, 4) Disaster Prevention, 5) Disaster Response Countermeasures, 6) Recovery and Reconstruction After Disaster, 7) Penalties, and 8) Supplementary Provisions.

19. In 2008, the DPRA was revised at the urging of local governments, which requested financial subsidization from the central government for post-disaster reconstruction activities. In 2009, Typhoon Morakot caused catastrophic damage to Taiwan and pushed the Legislative Yuan to pass the Special Act for Post-Typhoon Morakot Disaster Reconstruction. In addition, the Typhoon Morakot experience revealed the ineffectiveness of Taiwan's disaster management organization, and thus, the Legislative Yuan amended the DPRA in 2010 and 2012 due to political pressure and specifically established a new organizational structure. A gas explosion that occurred in Kaohsiung in 2014 demonstrated the risk of disaster posed by the fossil fuel industry as well as the risk of other man-made disasters; in response, the DPRA was revised to include provisions for man-made disasters. In 2016, an earthquake in the south of Taiwan destroyed more than 200 buildings and caused 117 deaths, and this further exposed the failure of the disaster risk management system under DPRA. The DPRA was then amended, with the legislature introducing a mechanism for emergency relief by which the government may provide relief, bailouts, and subsidies to qualified parties.

20. Tang, Tsai & Huang, *supra* note 7, at 148.

democratization and civic virtue are not synonymous, this experience suggests that, in societies comparable to Taiwan, democratization may deliver better law for managing disaster risks.

#### B. *Features of the Current DPRA System*

The experience of disasters and the process of democratization have served to gradually improve the disaster risk management system in Taiwan.<sup>21</sup> Although the system has become modern, the legacies of paternalism have also been incorporated into the law. Under the current DPRA system, the government assumes responsibility for disaster relief and leaves political leaders the discretion to decide specific courses of actions and the necessary amount of financial resources. After several amendments, the current DPRA has come to have three features: a comprehensive regulatory framework, a network system, and a complex financial support system that bears the paternalistic legacy.

##### 1. *A Comprehensive Regulatory Framework*

Prompted by the experience of several man-made disasters, Article 2(1) significantly expanded the scope of the disaster management system to encompass human-caused disasters such as failures of public gas/fuel pipelines or mining accidents, airplane crashes, forest fires, and toxic/hazardous chemical spills.<sup>22</sup>

The DPRA also established a three-phase framework for disaster management; the phases are disaster prevention, emergency response, and postdisaster recovery and reconstruction. Articles 22 to 26 prescribe measures and organizations for disaster prevention. Competent authorities should implement mitigation measures and build capacity for emergency response. Mitigation measures include disaster prevention and protection plans, relevant education and training, and research and information networks. In addition, the government must also develop policies for homeland protection, flood control, voluntary organization, and disaster insurance promotion, and protection of disadvantaged minority groups.

Articles 27 to 35 prescribes disaster response countermeasures such as alarm announcements, establishment of zones of caution, imposition of

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21. According to the Ministry of the Interior, more than 130,000 personnel were mobilized for typhoons and floods in 2016. Most of them were firefighters, police officers, and soldiers; some were auxiliary police officers and civil defense officers. NATIONAL FIRE AGENCY, MINISTRY OF THE INTERIOR, THE STATISTICS ON LOSSES OF NATURAL DISASTERS IN TAIWAN (1958-2018), <https://www.nfa.gov.tw/cht/index.php?code=list&ids=233> (last visited Mar. 3, 2022) (in Chinese).

22. DPRA art. 1 (Taiwan).

traffic and public order controls, firefighting coordination, provision of temporary accommodations, protection of disadvantaged minority groups, disease control, rescue and medical care operations, military assistance, and compensation. The DPRA also provided basis for emergent measures. A Commanding Authority and Disaster Response Center may authorize agencies to enact necessary response measures. If the scale of a disaster is beyond the capacity of local government, the superior government should provide resources and necessary assistance. The commanding authority may deploy the national army and nongovernmental organizations (NGOs) for disaster relief.<sup>23</sup>

Articles 36 to 37-2 prescribe measures for recovery and reconstruction, including reconstruction and medical care, settlement of refugees, redistribution of donations and governmental aid, building security, and traffic control. To effectively implement recovery and reconstruction measures, Articles 37-1 and 37-2 of the DPRA authorize governments to simplify administrative procedures and grant immunity from certain legal requirements. Article 36 encourages civic groups and enterprises to support disaster recovery.

By expanding the definition of disasters and regulatory framework, the DPRA provides a more comprehensive system for managing disaster risks and impacts.

## 2. *A Network of Organizations*

In light of the scale, complexity, and urgency of response to disasters, the DPRA provides for a two-track and trans-sectoral network to manage disaster risks. The two-track system consists of disaster risk management systems for ordinary times as well as emergency situations.

During normal times, central, municipal, and town government are all required to establish task-force Disaster Prevention and Response Councils (DPRCs) to make disaster management policies and plans.<sup>24</sup> All levels of governments are required to prepare a Plan of Disaster Prevention and Protection in advance of any disaster. The central competent authority should make a Disaster Prevention and Protection Basic Plan that includes a long-term disaster prevention and protection plan, an operation plan for disaster prevention, and guidelines for local disaster prevention and

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23. Article 31 of the DPRA provides that the commander of the disaster response center may command, supervise, and coordinate the national army, government agencies, public enterprises, the reserve force, the civil defense organization, and voluntary civil organizations in carrying out disaster rescue efforts.

24. For discussion of the relationship between central and local governments, see JIUNN-RONG YEH, *THE CONSTITUTION OF TAIWAN-A CONTEXTUAL ANALYSIS* 135-42 (2016).

protection plans. Local governments should establish their disaster prevention and response plans accordingly. These plans are subjected to periodic review every 3-5 years.

In consideration of the various characteristics of disasters, Article 3 of the DPRA assigns regulatory power to different agencies. The Ministry of the Interior is in charge of storms and earthquakes, the Ministry of Economic Affairs is delegated with authority to regulate flooding and drought disasters, and the Council of Agriculture is responsible for preventing landslides.<sup>25</sup> These central regulating authorities are responsible for managing disaster resources, organizing information, performing disaster prevention and rescue tasks, and cooperating with relevant agencies to conduct disaster prevention education for all citizens. These competent agencies usually participate in the policy-making process of the DPRC; they provide important information and facilitate the implementation of policies set by the DPRC. In addition, the Disaster Prevention and Response Committee and the Office of Disaster Management were established to oversee administrative affairs regarding implementation and coordination of disaster response activities. To introduce professional knowledge into the system, the Disaster Prevention and Protection Expert Consultation Committee and the National Science and Technology Center were established; they serve to provide scientific information and advice.

In an emergency, each level of government is required to establish an emergency operations center. In the event of a major disaster, the central government and relevant local government shall establish a disaster response center to oversee that adequate measures are implemented to prevent a disaster or reduce the damage therefrom. The emergency operations center and disaster response center are responsible for mobilizing and coordinating resources for disaster response and rescue. The command center supervises and coordinates the personnel of the functional authorities to carry out disaster rescue missions. The National Fire Agency is the actual agency that executes disaster prevention and protection missions. Military corps and civic groups are both involved in the system when a major disaster occurs.

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25. Article 3 of the DPRA prescribes that “[for] [p]revention, response and recovery for all types of the disasters, the following agencies shall be the central regulating authorities for the disaster prevention and protection: 1. Windstorm, earthquake (including soil liquefaction), fire, explosion, and volcanic disaster: Ministry of the Interior; 2. Flooding, draught, mining disasters, industrial pipeline disaster, public gas, fuel pipeline and power transmission line failure: Ministry of Economic Affairs; 3. Frost, debris flow, forest fire, animal and plant diseases: Council of Agriculture, Executive Yuan; 4. Air crash, shipwreck and land traffic accidents: Ministry of Transportation and Communications; 5. Toxic chemical materials and suspended particulate disaster: Environmental Protection Administration, Executive Yuan; 6. Biological disaster: Ministry of Health and Welfare; 7. Radiation disaster: Atomic Energy Council; 8. Other disasters: the central regulating authorities of Disaster Prevention and Protection business designated by [the] Central Disasters Prevention and Protection Council.”

These organizational arrangements indicate that the drafters of the DPRA recognized the importance of coordination between all levels of government and various agencies. However, the categorization of disaster management tasks as subordinate to the regular operations of agencies indicates that Taiwan's government regards disaster management as an additional and accidental task that requires only temporary mobilization.

### 3. *Weak Financial Mechanism*

Yet, paternalist politics does not result in a stable legal mechanism for disaster relief. Few provisions on compensation and financial aid were enacted in the DPRA.<sup>26</sup> Instead, the need for financial support is largely addressed by executive ordinances or private charity.

Individuals may seek further financial support under the Public Assistance Act or Article 48 of the DPRA. The Public Assistance Act is not predominantly concerned with disaster relief but nevertheless suggests that people who are severely impacted by a disaster may apply for disaster aid; the details are subject to further regulations of local governments and competent authorities.<sup>27</sup> Similarly, Article 48 of the DPRA delegates responsibility to the central regulating authorities to enact ordinances for categories and standards of support for different types of disasters.<sup>28</sup> Accordingly, more than 10 ordinances for disaster aid and support have been promulgated by various agencies, and all have different frameworks and procedures.<sup>29</sup>

Despite the seemingly generous provisions for financial support, the lack of clear standards concerning qualifications for receiving aid and making allocations means that decisions regarding the award of financial aid and subsidies can easily be affected by public opinion, political context, and politicians' personal attitudes. For example, the Executive Yuan set a standard death subsidy of NTD200,000 for a life lost in a disaster. However,

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26. Measures for financial relief in the DPRA include budget adjustments, subsidies, tax exemptions, and other financial bailouts. The central government provides financial resources for disaster management from the annual budget, and it may adjust the budget without being subject to Articles 62 and 63 of the Budget Act. A local government may request a subsidy when it is unable to finance necessary expenditures. The government may create tax exemptions, and may collect support fees for the National Health Insurance and other government-run insurance. Financial institutions are required to provide various financial tools such as low interest loans, loan offsets, and repayment extensions to reduce the burden of individuals who are affected by a disaster. Article 44-2 of the DPRA.

27. She Hui Jiu Zhu Fa (社會救助法) [Public Assistance Act] art. 25-27 (Taiwan).

28. DPRA art. 48 (Taiwan).

29. These ordinances include categories and standards of disaster aid for landslides, flooding, drought, agricultural and natural disasters, mining disasters, toxic chemical materials disasters, windstorms, earthquakes, fires, explosions, industrial pipeline disasters, and failures of public gas or fuel pipelines and power transmission lines.

for the severe earthquake of September 21st, the central government changed the amount of relief three times in a day, raising it from NTD 40,000 per person to NTD 1 million per person, with no reason provided.<sup>30</sup> In addition, private institutions also provide financial support for disaster relief.

To provide information for financial resources available for victims of natural disasters, the Executive Yuan made an inventory on available resources for disaster relief in 2018, identifying the categories, standards, and institutions of financial aid. The result of the inventory was a guidebook 116 pages long. Take death relief as an example. For death relief, one may apply for NTD200,000 from both the Ministry of Health and Welfare and the Department of Social Welfare of the local government. A victim may also apply for NTD400,000 from the Relieve Disaster Foundation, whose budget is partly provided by the Executive Yuan. Additional subsidies are available for students, soldiers, indigenous persons, or veterans. The categories and standards for life assistance and property relief are much more complex and fragmented.<sup>31</sup>

The inventory provided a comprehensive overview of assistance, but insufficient coordination and cooperation may lead to ineffective, arbitrary, and unfair results. Every institution has a budget, review procedures, and standards. How much a victim of a disaster may be awarded depends on their ability to maneuver the complex rules, to receive the available resources of each institution, and to navigate the turbulent political and social dynamics following the specific disaster.

Under the relatively modern DPRA system, the government assumes the primary role in disaster management. From planning, budget allocation, and response mobilization to recovery coordination, the government is assigned an enormous burden. The DPRA establishes a network where different agencies are responsible for different types of disasters and a disaster response system that coordinates three levels of government. During a disaster, agencies suspend their daily work and report to the emergency operations center or disaster response center; a flexible network for coordinating rescue resources is assembled in a short time.<sup>32</sup>

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30. Chi-Chen Huang (黃啟禎), *Tian Ran Zai Hai Jiu Zhu Cuo Shi Zhi Yan Jiu* (天然災害救助措施之研究) [*A Study on the Relief Measures on Natural Disasters*] 59-63 (2000), [http://ebooks.lib.ntu.edu.tw/1\\_file/rdec/528/528.pdf](http://ebooks.lib.ntu.edu.tw/1_file/rdec/528/528.pdf).

31. Zhong Yang Tian Ran Zai Hai Fang Jiu Hui Bao (中央天然災害防救委員會) [National Disaster Prevention and Response Council], *Zai Hai Jiu Xie Jiu Shih Siang* (災害救協助事項) [The Affairs on Disaster Relief and Assistance] (2018), <https://cdprc.ey.gov.tw/Page/9DAB0C7D30ED68EB>.

32. In addition to the DPRA, the National Health Insurance system in Taiwan helps to mitigate physical harm and adverse health outcomes, which also significantly enhances the resilience of Taiwanese society when extreme weather events occur. See Ya-Wen Lei, *National Health Insurance, Health Policy, and Infection Control: Insights from Taiwan* (Context Mar. 25, 2020), <https://contexts.org/blog/the-global-coronavirus-epidemic-commentary-on-east-asias-response/#lee>.

Decades of effort to grow the economy and democratize the country have contributed to the preparedness capacity of Taiwan. Economic growth since the 1970s has enriched Taiwan with material resources that can be mobilized in disasters. Democratization since the 1990s has incrementally created a sense of community and respect for human dignity. Years of practice have created a virtuous circle and integrated the contributions of civil society into Taiwan's disaster relief system. Therefore, citizens are willing to contribute their money, expertise, and labor to rescue those who suffer in severe disasters. Civic virtue and solidarity are valuable foundations that are critical to a society's resilience and disaster management. Previous experiences have demonstrated Taiwanese society's capacity for resilience in the face of disasters.

### C. *The Deficits of the DPRA and the Case of Morakot Typhoon*

However, current legal system and its operation also reflects negative consequences of democratic politics. Problems of the current DPRA include: fragmentation, understated prevention, financial uncertainty. The disaster response to Typhoon Morakot in 2009 and postdisaster relief and reconstruction efforts highlight the deficit of DPRA and its political discrepancy.

On August 6-8, 2009, Typhoon Morakot hit Taiwan with unprecedented rainfall and resulted in serious damage.<sup>33</sup> As one of the most catastrophic disasters in the history of Taiwan, it tested the capacity of the DPRA disaster risk management system. In response to this single event, (for which some soldiers were mobilized more than once) the government decreed more than 500,000 soldier-mobilization events and spent more than NTD120 billion. Although Taiwan recovered from the disaster, the relief and reconstruction experience revealed four major problems with the disaster risk management system under the DPRA.<sup>34</sup>

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33. At the Alishan weather station in Chiayi County, because of the typhoon, 1,623.5 mm of rain fell in 24 hours and 2,884 mm in 72 hours, creating new records in Taiwan. This single typhoon caused more than NTD1,526 billion in damage to Taiwan's public infrastructure and a total of NTD200 billion in property losses. It also caused 651 deaths. In Xiao-Lin village alone, a serious mudslide caused more than 500 deaths. See Jing Ji Bu (經濟部) [The Ministry of Economy], *Morakot Typhoon Bao Yu Liang Hong Liu Liang Fen Xi (莫拉克颱風暴雨量洪流量分析) [The Rainfall and Flood of the Morakot Typhoon]* (2009), <http://www.taiwan921.lib.ntu.edu.tw/88pdf/A8801RAIN.pdf>.

34. The case of Typhoon Morakot revealed how politics affects the operation of the DPRA and undermines the function of the current system. Some victims of the typhoon brought their case to court, arguing that the Kaohsiung City government failed to actively instruct the district office to evacuate residents, which resulted in 100 deaths caused by a severe landslide. The Kaohsiung City government provided three arguments in defense: 1) The scale of rainfall was beyond any historical record, and the government could not foresee the possibility of this; 2) the government did establish an emergency response center and therefore was not negligent; 3) there was no causal relationship

### 1. *Fragmentation, Politics, and Ineffectiveness*

The current DPRA aims to provide a flexible and transsectoral network to manage disaster risk, but actual disaster politics has led to a network that is fragmented and ineffective.

The case of Morakot Typhoon revealed how political incentives may prevent genuine coordination between local and central governments. The DPRA requires the central government and local governments to establish a response center, but the division of labor and between them and respective responsibilities are unclear. When Typhoon Morakot hit the south of Taiwan, the central government failed to provide assistance at the first place because the political tension between the President and the incumbent mayor of the opposition party. The central government intervened after taking strong criticism from civil society, yet the central government missed the critical period of time when it could have most effectively mitigated the damage.

Similar problem occurred between the President and the Premier. According to Article 34 of the DPRA, local governments may request the assistance of the army when they are unable to respond to disasters. It is unclear when and how the army participates in disaster rescue and response. When Typhoon Morakot hit Taiwan, local governments requested support from the central government. Despite being the commander of the DPRA system, the Minister of the Interior was unable to command the Minister of Defense to provide military assistance for emergency relief because they are both second-level agencies. The President, who is the commander of the army, refused to mobilize the army because he believed that the Premier had ordered the army to cooperate with local governments in disaster response and rescue.<sup>35</sup> Therefore, the army did not provide relief assistance and therefore failed to participate in crucial rescue work from the first moment. During the Typhoon Morakot disaster, the army participated heavily in response, rescue, and recovery: yet, the damage from the disaster would have been reduced if the disaster management system had enabled appropriate and effective reaction.<sup>36</sup> After Typhoon Morakot, the Ministry of

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between the casualty and the inaction of the district office because the landslide destroyed the settlement shelter for evacuated residents. Taiwan's supreme court suggested that the chief villager of Xiao-Lin village should have enforced the order of evacuation but failed to do so; this met the requirement for state liability. However, only 15 of 179 plaintiffs were awarded compensation because the others were not residents of the area at high risk for a landslide. This judgment prompted debate on the requirements for and scope of state liability in disasters. Kaohsiung Gaodeng Fayuan [Kaohsiung High Ct.], Civil Division, 106 Chung Shang Kuo Keng I Tzu No. 1, 2 (2019) (Taiwan).

35. For discussion of the role of the President and the Premier, please see YEH, *supra* note at 24, 57-79.

36. From August 8 to September 9, the army mobilized 536,636 soldiers, 26,529 vehicles, and more than 5,400 airplanes. They devoted extensive efforts to rescue, disinfection and disease prevention, road rehabilitation, transportation, medical service, refugee settlement, dredging, and

Defense amended laws and regulations to include disaster prevention and response among its primary tasks and conducted preparatory work to enhance its capacity in disaster rescue and response. The Legislative Yuan also amended the DPRA and authorized the military to assume an active role in initiation of disaster rescue and response.<sup>37</sup>

In addition to ineffectiveness, the organizing disaster response into task forces prevents the accumulation of experience, best practices, and institutional culture. Under the current system, almost no full-time or professional personnel consistently devoted to disaster management. The disaster-response commander and other personnel are only required to suspend their daily work for disaster response temporarily, and some of the rescuers or personnel are hired on a part-time basis. When a disaster has settled down, the center is shut down and the staff are dismissed. Personnel with rescue and recovery professions are not guaranteed a job and remuneration, therefore it is difficult to pass down their experience and enhance the capacity of the DPRA system. The current system is basically a fragmented centralized system designed for temporary operations, which not only deter optimally effective post-disaster recovery efforts but also create space for corruption and political manipulation.

## 2. *Financial Uncertainty and Accountability*

Disaster rescue and relief require a vast amount of money. The current system strongly relies on special budgetary allocations and charity, which may not provide sustainable support for victims and may not provide an incentive for protective actions. Moreover, the lack of clear standards concerning qualifications for receiving aid and making allocations means that decisions regarding the award of financial aid and subsidies can easily be affected by public opinion, political context, and politicians' personal attitudes.

Due to the limits of the legal budget, the government seeks financial support from "special budgets" that may compromise other policies.<sup>38</sup> From

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many other tasks. See Chih-Po Chen et al. (陳勁甫等), *Wo Guo Guo Jyun Tou Ru Zai Hai Jiu Yuan Zhi Yan Jiu* (我國國軍投入災害救援之研究) [A Study on the Contribution of Military on the Disaster Rescue] 221-36 (2000), <https://ws.ndc.gov.tw/001/administrator/10/refile/5644/25501/47f7f153-a26d-486f-8c74-6f9061cf88b3.pdf>.

37. Article 34, section 4 of the DPRA prescribes that "If the municipal, or county (city) government or the central disaster prevention and protection operation regulating authorities fails to cope with the disaster, it may request support from the national army. However, the national army shall actively support responsive measures of major disaster rescue."

38. According to Article 83 of the Yu Suan Fa (預算法) [Budget Act] of Taiwan, the Executive Yuan may, outside of the annual general budget, propose a special budget in the event of a major catastrophe.

2009 to 2011, the government mobilized a special budget of NTD116,508,241 for recovery and reconstruction.<sup>39</sup> The highest allocation was for public infrastructure reconstruction, but a significant amount of the budget was for disaster support aid.<sup>40</sup>

In addition to the government budget, the general public contributed substantial donations. Civic groups immediately initiated charity fundraising after the news of the disaster. Schools, private enterprises, TV stations, and NGOs voluntarily organized fundraising activities to collect needed materials and money. According to the statistics data report from the Ministry of Health and Welfare, 56 organizations initiated fundraising after Typhoon Morakot and collected approximately NTD14.5 billion.<sup>41</sup> Most of the money was used for settlement and reconstruction, including the permanent housing project.<sup>42</sup>

The significant amount of special budget and donation depends on incidental factors such as political concerns, misinformation, media reports, personal feelings, and economic conditions. There is no clue about the amount of budget and private donation for the next disaster. The uncertainty left victims to passively rely on politics and the “good heart” of civil society.

Private charity may create issues of transparency and accountability. In April 2012, the National Audit Office investigated the flow of raised funds and disclosed the fact that more than NTD4.1 billion had not been spent. Some measures taken by NGOs also generated issues of equal protection and cultural conflicts.<sup>43</sup> Misappropriation of resources and mismanagement led

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39. Disaster rescue and relief for disastrous Typhoon requires a vast amount of money, including cost for recovery, reconstruction, and prevention of ongoing damage; monetary aid; low-interest loans; material aid; budget subsidies to local governments; and losses on tax and insurance income.

40. According to the White Paper on Disaster Prevention and Rescue (hereinafter, White Paper), of the special budget allocations, NTD4 billion was prepared for flooding aid, NTD2.42 billion for relocation aid, NTD3.75 billion for financial assistance for various insurance and loan costs, NTD0.41 billion for death and missing person aid, NTD1.02 billion for financial support for recovery, NTD3.93 billion for aid for agricultural losses, and NTD5.52 billion for the construction of “permanent housing” for disaster refugees. Zong Tong Fu (總統府) [Office of the President], *98 Zhi 101 Nian Du Zhong Yang Zheng Fu Morakot Typhoon Zai Hou Zhong Jian Te Bie Yu Suan An Shen Cha Bao Gao (98 至 101 年度中央政府莫拉克颱風災後重建特別預算案審查報告)* [The Review Report for the Special Budget for Reconstruction after Typhoon Morakot 2009-2012] 2-3 (2009), <https://www.president.gov.tw/Portals/0/Bulletins/paper/pdf/6892-1.pdf>.

41. The Red Cross Society of Taiwan raised NTD5.3 billion, and the Buddhist Compassion Relief Tzu-Chi Foundation raised NTD4.8 billion. The information on charity in response to Typhoon Morakot is provided by the Ministry of Health and Welfare. Please see Wei Sheng Fu Li Bu (衛生福利部) [The Ministry of Health and Welfare], *Information on Charity after Typhoon Morakot*, <https://sasw.mohw.gov.tw/app39/disasterView/post?eventId=269834463> (last visited Aug. 22, 2019).

42. Tzu-Chi has built more than 1276 houses for disaster refugees. See Buddhist Compassion Relief Tzu Chi Foundation, *Ba Ba Feng Zai Zhi Xing Jin Du (八八風災執行進度)* [The Result and Financial Report on August 8 Disaster], <http://tw.tzuchi.org/financial/2009morakot/item3.html> (last visited Aug. 15, 2019).

43. For example, a NGO, Tzu-Chi, has contributed to establish permanent House for Morakot refugees. However, as a Buddhist organization, Tz u-Chi changed the Community Activity Center into

to corruption and infringement of rights, and further, current law failed to hold private entities accountable.<sup>44</sup>

### 3. *Understated Prevention and Recovery*

Research has suggested that voters reward politicians much more for disaster relief spending than prevention spending and therefore the infrastructure of disaster and recovery is usually understated.<sup>45</sup> Media covers the progress of disaster relief when a disaster occurs, which draws extensive public attention. A government that is devoted to rescue, settlement, and relief fulfills the traditional ideal of “paternalist government” and earns popularity. However, the efforts related to prevention, recovery, and preparedness tend to fade from popular consciousness soon after a disaster. The costly and complex work of disaster prevention usually receives minimal attention from the media and voters.<sup>46</sup> Therefore, elected officials have little incentive to drive policy toward more proactive measures, despite of the fact that reactive efforts sometimes mask the fact that severe damage could have been prevented or mitigated in the first place. The temporary workforce of disaster response also contributes to asymmetric operations. The DPRC oversees and implements disaster plans. However, the system functions almost exclusively in times of disaster because it is mostly composed of part-time personnel from the National Fire Administration without full-time staff. Therefore, these persons may be experienced in disaster response but not in mitigation and recovery. As a result, the comprehensive legal scheme disproportionately emphasizes disaster response and seriously understates the importance of prevention and recovery.

When the Typhoon hit Taiwan, the current system of disaster risk management was mostly established. Under the system, the responsibility to notice and evacuate villagers of the Xiao-Lin village was on the chief of the

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a Buddhist temple and hung a painting of Buddha in the public space, even it well understood that most indigenous residents in the permanent housing were Christian. Moreover, indigenous residents who had earned their living working in nature could not find jobs after they moved to the permanent housing in an urban area.

44. See Daniel A. Farber, *Catastrophic Risk, Climate Change, and Disaster Law*, 16 ASIA PACIFIC J. ENVTL L. 37, 50-52 (2013).

45. See Andrew Healy & Neil Malhorta, *Myopic Voters and Natural Disaster Policy*, 103 AM. POL. SCI. REV. 387, 387-406 (2009).

46. In a study on Hurricane Sandy, which occurred in the United States, researchers found that voters tended to reward candidates for funding relief but not for preparedness efforts, despite the latter being more economical, efficient, and safe. On the other hand, politicians usually take the opportunity to expose themselves in the media, yet under media pressure, politicians take political consideration over rationales of disaster management. See Ute Dymon & Rutherford Platt, *U.S. Federal Disaster Declarations: A Geographical Analysis*, in *DISASTERS AND DEMOCRACY: THE POLITICS OF EXTREME NATURAL EVENTS* 47, 57 (Rutherford Platt ed., 1999).

village. When the command center issued red alert and made an order to evacuate, the chief of the village was obliged to notice and evacuate villagers. The Court attributed the responsibility to the chief of the village, saying that the chief failed to receive phone calls from the command center and enforce the order to evacuate.

Despite of the fact that the chief failed to response the call for evacuation, the condemn on the chief had missed the problem of malfunctioned disaster prevention system. Very few efforts were even put for the area that had been identified as landslide vulnerable. Villagers received scarce knowledge and capacity to mitigate damage in a disaster. Competent agencies were ill-equipped with necessary knowledge, training and facilities.<sup>47</sup>

#### D. *Creating Passive Citizens*

Disaster politics in Taiwan has contributed to the progress of disaster law, but the experience of Typhoon Morakot revealed its dark side. Partisan politics may exaggerate the problems of fragmentation and unsustainability, deterring the effectiveness of disaster measures and actions.<sup>48</sup> The special allocation of disaster aid provides the space for disaster politics to compel the government to spend more than it should reasonably offer. Donations from civil society can mask financial shortfalls of the government, but the current law fails to provide mechanisms that make private entities transparent and accountable.

In addition, disaster politics may also create an unexpected problem: passive citizens. Platt posed some critical questions: “to what extent [does] the likelihood of generous federal assistance serve to diminish the natural caution that individuals, communities and business might otherwise exercise in adjusting to natural hazards in their investment and locational decisions? At what point does compassion lead to ‘codependency whereby potential disaster victims and their federal protectors become locked into a repetitive cycle of loss, compensation, reconstruction and new losses?’”<sup>49</sup>

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47. Three months after the disaster, the Control Yuan impeached the Township Mayor of the Jia-Xian for his failure to response and implement the work of prevention and rescue. The Control Yuan further proposed corrective measure on the Bureau of Jia-Xian and the government of Kaohsiung County for their ignorance of the alert of the Central Weather Bureau and failure to actively instruct and assist township to evacuate villagers. See Hui-Zhēn Lín, *Bu Yi de Sù Sòng Bā Bā Fēng Zāi de Chā Bié Guó Péi* (不義的訴訟：八八風災的差別國賠) [*Unjust Litigation-The Differentiated National Compensation of the Typhoon Morakot*] (The Reporter, Aug. 2, 2019), <https://www.twreporter.org/a/typhoon-morakot-10-years-xiaolin-village-state-compensation>. (last visited Aug. 21, 2020).

48. Other cases reveal further problems of citizen participation and incompatible regulations, procedures, and standards made by different agencies.

49. Rutherford Platt, *Shouldering the Burden: Federal Assumption of Disaster Costs*, in

Citizens who frequently experience typhoons or floods may feel less need to prepare for catastrophic disasters that happen only once in several decades. Government bailouts and charity may even reduce citizens' incentive to take protective actions to mitigate losses.<sup>50</sup> Individuals may be less inclined to take measures for risk prevention and loss mitigation.<sup>51</sup> Ironically, Taiwan's vibrant civil society demands a strong government in a disaster but ignores the capabilities and responsibilities of citizens.

### III. CLIMATE CHANGE AND THE NEED FOR INSURANCE

The DPRA regime may be capable of managing disaster risk despite the aforementioned problems, but it faces more serious challenges with the warming globe. Climate change is predicted to cause frequent and catastrophic disasters. Extreme events such as fires, floods, mudslides, and heat waves are expected to become more widespread and frequent.<sup>52</sup> As a small island with tall mountains and short rivers, Taiwan's geography and ecosystems are highly sensitive to change, and its location in an area prone to typhoons and monsoons further increases the risk of exposure to extreme weather events. The urbanization and overuse of land in Taiwan also aggravate its vulnerability to climate change. Studies have indicated that the frequency of extreme weather events is increasing. Extreme weather events tended to occur every 3 to 4 years in the past; however, in recent years, extreme weather events are occurring almost every year.<sup>53</sup> Another study reported several significant findings, namely a rising sea level around Taiwan, an increasing gap between the dry and wet season, and an increasing frequency of scorching weather and strong typhoons.<sup>54</sup> The degree of damage from extreme weather events is increasing too. According to the Ministry of Internal Affairs, three floods and five typhoons in 2016 resulted

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DISASTERS AND DEMOCRACY: THE POLITICS OF EXTREME NATURAL EVENTS 9 (Rutherford Platt ed., 1999).

50. See James M. Buchanan, *The Samaritan's Dilemma*, in ALTRUISM, MORALITY AND ECONOMIC THEORY 71, 71 (Edmund S. Phelps ed., 1975); see also, QIHAO HE, CLIMATE CHANGE AND CATASTROPHE MANAGEMENT IN A CHANGING CHINA 39, 43 (2019).

51. Roger Van den Bergh & Michael Faure, *Compulsory Insurance of Loss to Property Caused by Natural Disasters: Competition or Solidarity?*, 29 WORLD COMPETITION 25, 25-54 (2006).

52. For discussion of these challenges, please see, TIM BONYHADY, ANDREW MACINTOSH & JAN McDONALD, ADAPTATION TO CLIMATE CHANGE: LAW AND POLICY 2-25 (2010).

53. H. H. Hsu (許晃雄等) et al., *Tai Wan Qi Hou Bian Qian Ke Xue Bao Gao Chong Ji Yu Tiao Shi Mian Xiang* (台灣氣候變遷科學報告—衝擊與調適面向) [*The Science Report on Taiwan's Climate Change-Impact and Adaptation*] 81-134 (2017), [https://tccip.ncdr.nat.gov.tw/publish\\_01\\_one.aspx?bid=20171220140117](https://tccip.ncdr.nat.gov.tw/publish_01_one.aspx?bid=20171220140117) (last visited June 25, 2021).

54. H. H. Hsu et al. (許晃雄等), *Tai Wan Qi Hou Bian Qian Ke Xue Bao Gao Wu Li Mian Xiang* (台灣氣候變遷科學報告物理面向) [*The Science Report on Taiwan's Climate Change-Physical dimension*] 81-134 (2017), <https://tccip.ncdr.nat.gov.tw/upload/book/20180410112426.pdf> (last visited June 13, 2020).

in 3 deaths, 1,109 injured persons, and 1,000 destroyed or partially destroyed houses. In 2017, five typhoons and three floods also caused hundreds of deaths. Property damage was severe too. Typhoon Soudelor in 2015, for example, resulted in NTD3.5 billion in property and infrastructure damage. Despite Taiwan's considerable vulnerability, the government and society have not sought to actively implement laws and policies to mitigate climate change.<sup>55</sup>

Regarding the coming threat of climate change, Taiwan needs to be equipped with a more resilient disaster management system, one that might reduce the harm of politics and enhance the capacity of society at the same time. One possible solution is to integrate climate change adaptation into the disaster risk management system.<sup>56</sup>

#### A. *Integrating Climate Change Adaptation into Disaster Risk Management*

The global community has noticed the challenge of incorporating climate change into disaster risk management systems. In 2005, the Hyogo Framework for Action 2005-2015 was adopted, urging future-oriented approaches to disaster risk management that consider climate change. The Bali Action Plan adopted in 2007 at Conference of the Parties of the United National Framework Convention on Climate Change recognized the necessity of harnessing strategies for extreme weather events. In 2015, Goal 13 of the UN Sustainable Development Goals specifies the following: "take urgent actions to combat climate change and its impacts through strengthening resilience and adaptative capacity to climate-related hazards,"<sup>57</sup> which encourages linking climate change adaptation and disaster risk management. The Intergovernmental Panel on Climate Change (IPCC) has also endorsed a risk perspective for assessing various climate-related threats.<sup>58</sup> Scholars and institutions are promoting the same agenda.<sup>59</sup> In

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55. For discussion of Taiwan's climate change law and policy, please see Jiunn-Rong Yeh & Chun-Yuan Lin, *The Paris Agreement and the Transformation of Global Climate Law: Taiwan's Perspective*, 13(2) NTU L. REV. 1, 1-32 (2018).

56. For example, the UN Office of Disaster Risk Reduction has emphasized the priority of risk management for climate change disasters. The Mid-Term Review (2010-2011) of the Hyogo Framework for Action also noticed the integration of climate change adaptation and disaster risk reduction for reducing disaster losses. Moreover, UNISDR advocates for synergy between disaster risk reduction and climate change. Introduction on the Hyogo Framework for Action, please see Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, <https://www.undrr.org/vacancy/consultant-mid-term-review-hyogo-framework-action> (last visited Jan. 13, 2020). See also William E. Easterling III, Brian H. Hurd & Joel B. Smith, *Coping with Global Climate Change: The Role of Adaptation in the United States* 17 (2004), <https://www.c2es.org/document/the-role-of-adaptation-in-the-u-s/> (last visited June 30, 2021).

57. United Nations Department of Economic and Social Affairs 2015.

58. See generally, IPCC, MANAGING THE RISK OF EXTREME EVENTS TO ADVANCE CLIMATE CHANGE ADAPTATION (2012); IPCC, IPCC Fifth Assessment Report (2015).

particular, the need to include an adaptation policy in disaster management has been recognized.

Climate change adaptation shares the core goal of disaster risk management: managing hydrometeorological hazards through vulnerability and exposure reduction, resilience enhancement, and risk transfer and sharing.<sup>60</sup> To achieve this goal, a disaster risk management system in the climate change era should aim to reduce the impacts of climate-related disasters and associated risks and promote a long-term approach to disaster management.<sup>61</sup>

According to the IPCC (the Intergovernmental Panel on Climate Change) and as used in this article, climate change adaptation in a social system is “the process of adjustment to actual or expected climate change and its effects, in order to moderate harm or exploit beneficial opportunities.”<sup>62</sup> Adaptation also indicates a paradigm shift in disaster management because it includes how we think about and behave toward climate-related disasters. With regard to climate adaptation, three principles should guide future disaster risk management system: adaptation, governance, and sustainable financing.

#### 1. *From Response to Adaptation*

Traditionally, disaster law has been responsive. The system is triggered when a disaster occurs and proceeds to basically cease operations after the disaster. A disaster has been regarded as an unpredictable natural misfortune that offers little time in which to prepare or take preventive actions. Although modern discourse on disaster risk management has taken prevention and recovery into consideration, politics usually understates the importance of prevention and recovery.

Climate change challenges this paradigm in two ways. First, in the era of climate change, disasters are set to become more frequent and catastrophic; they may become part of life. Second, climate change is attributable to at least some extent to greenhouse gas (GHG) emissions by humans; therefore, it is preventable and mitigable. Thus, extreme weather events should no more be regarded as unpredictable and unfortunate disasters: they should be addressed with preventive and precautionary approaches.

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59. See Faber, *supra* note 44, at 37-52.

60. IPCC, *supra* note 58, at 41-43.

61. Giuseppe Forino, Jason von Meding & Gramham J. Brewer, *A Conceptual Governance Framework for Climate Change Adaptation and Risk Reduction Integration*, 6 INT’L J. DISASTER RISK SCI. 372, 373 (2015).

62. IPCC, *supra* note 58, at 556.

Disaster risk management should integrate climate change adaptation to develop an agenda and adjust the socioeconomic system to cope with disasters. Disaster risk management for climate change adaptation emphasizes the need to reduce vulnerability and enhance socioeconomic resilience in addition to performing disaster relief tasks. Reducing vulnerability entails emphasis on the preventive and precautionary functions of the system, such as preparedness, prevention, and mitigation. Enhancing resilience stresses the capacity of a society to recover from disastrous damage. Overall, climate change adaptation refers to a shift to prevention and recovery.<sup>63</sup>

## 2. *From Government to Governance*

A paradigm shift is also necessitated by climate change adaptation that entails shifting focus from government to governance. In the climate change era, a highly centralized and hierarchical system may be a notably counterproductive form of governance.<sup>64</sup> The global scope and uncertainty of climate change require reform of the traditional top-down government structure to a form of decentralized governance. Many scholars have argued for a redistribution of the power, function, and accountability of states to nonstate actors in society and the market.<sup>65</sup> With sufficient coordination and accountability, a decentralized network may be able to amplify the advantages of various actors to deal with the complexity, uncertainty, and ambiguity of a changing climate.

The existing disaster management has established a network with multiple agencies, subnational governments and private sectors, yet it is crucial to enhance coordination and accountability. Legal mechanisms and policies such as public-private partnerships between states and enterprises, private-social partnerships between enterprises and social actors, and comanagement by state and social actors should be considered and institutionalized.

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63. Daniel Farber proposes a “disaster cycle” as a basis to develop a better system. A disaster cycle consists of mitigation, emergency response, compensation, and rebuilding. Please see Farber, *supra* note 44, at 41.

64. It is commonly observed that highly centralized government system tend to overstretch and become vulnerable. See, e.g., Michael Howes, Peter Tangney, Kimberley Reis, Deanna Grant-Smith & Michael Heazle, *Towards Networked Governance: Improving Interagency Communication and Collaboration for Disaster Risk Management and Climate Change Adaptation in Australia*, 58 J. ENVTL. PLAN. & MGMT. 757, 757-66 (2015).

65. Forino and others scholars have developed a three-pillar framework, arguing that a disaster risk management system with climate change adaptation should include actors from the state, society, and market. Forino, von Meding & Brewer, *supra* note 61, 374-81.

### 3. *Sustainable Financial Mechanism*

Climate change adaptation requires a stable financial mechanism capable of redistributing and mitigating risks to cover the huge and constant cost. The government budget and charity is insufficient and unreliable for long-term prevention and recovery efforts. Policymakers addressing climate change are well aware of the importance of financial support and seek to establish various financial tools such as funds and insurance. A separate and sustainable financial mechanism may be effective to redistribute risk and provide a stable basis to mitigate risk and enhance social resilience. However, the risk of climate-related disasters may pose challenges to insurers.<sup>66</sup>

#### B. *Enhancing Resilience through Insurance*

When faced with catastrophic losses from climate-related disasters, insurance can facilitate mitigation and adaptation. Climate change is mitigatable. Therefore, building socioeconomic resilience requires preventive risk management and adaptive strategies.

Policymakers are gradually recognizing the financial impact that will result from climate-related disasters and the ineffectiveness of traditional postdisaster financial assistance; thus, they are seeking a stable financial solution to transfer and redistribute disaster risk. Because it is built on the concept of risk management, insurance is a promising choice for climate disaster management financing. The insurance market may be best able to provide risk information and risk pricing expertise, innovative products to transfer risk, and mechanisms to redistribute risk. A well-designed insurance policy could increase a community's resilience against climate-related disasters. Countries with widespread market-based insurance coverage usually recover faster from the financial impacts of extreme events.

Insured persons may change their behavior to reduce risk; insured persons who engage in high-risk behaviors tend to pay higher-than-usual insurance premiums. Through its underwriting business and investment strategies, including decisions concerning which assets to insure and on what terms, insurers may push the insured to take protective measures or to transition to low-carbon practices. Many scholars have suggested that a well-designed insurance system may not only help a society to recover from climate-related disasters but may also be an effective method to mitigate

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66. See A. Dan Tarlock, *United State Flood Control Policy: The Incomplete Transition from the Illusion of Total Protection to Risk Management*, 23 DUKE ENVTL. L. & POL. F. 151, 168 (2012). See also Karl Harvey Schultz, *Financing Climate Adaptation with a Credit Mechanism: Initial Considerations*, 12 CLIMATE POL. 187, 187-91 (2012).

climate risk. Scholars have also suggested that insurance is a better mechanism than direct government intervention in disaster relief.<sup>67</sup>

However, the anticipated magnitude of climate disasters makes the elimination of uncertainty by an individual insurance company difficult. The market for insurance is based on the ability of insurance companies to pool risks faced by numerous policy holders whose risks are not related to each other. In a catastrophic weather event, the risks of policy holders are all related. The typical insurance company's practice of pooling risk to reduce uncertainty is thus limited in catastrophic events.<sup>68</sup>

In addition to the efforts of private insurance companies, catastrophic insurance coverage has been marketed in several countries with different forms of public-private cooperation, including the National Flood Insurance Program in the United States, Catastrophes Naturelles in France, the Turkish Catastrophe Insurance Pool in Turkey, and the private flood insurance system in the United Kingdom.<sup>69</sup>

#### IV. CLIMATE INSURANCE POLICIES FOR TAIWAN

In the face of changing climate, Taiwan has enacted National Guideline for Climate Change Adaptation Policy (hereinafter "Adaptation Guideline") in 2010 and Adaptation action Programs in 2012. However, similar to the DPRA implementation, politics influences the forming and implementation of action programs regarding to disaster and adaptation. Adaptation Guideline and action programs re-phrase the task already taken under DPRA. Few actions are actually taken to prevent disasters or climate adaptation because the public tends to underestimate their importance.<sup>70</sup> Climate insurance may balance the negative impacts of disaster politics and

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67. E.g., Dwight Jaffee & Thomas Russell, *Catastrophe Insurance, Capital Markets, and Uninsured Risks*, 64 J. RISK & INS. 205, 205 (1997); W. J. W. Botzen & J. C. J. M. van Den Bergh, *Insurance against Climate Change and Flooding in the Netherlands: Present, Future, and Comparison with Other Countries*, 28 RISK ANALYSIS 413, 413-26 (2008); Sean B. Hecht, *Climate Change and the Transformation of Risk: Insurance Matters*, 55 UCLA L. REV. 1559, 1559-60 (2008); Michael G. Faure, *Insurability of Damage Caused by Climate Change: A Commentary*, 155 U. PENN. L. REV. 1875, 1875-77, 1899 (2007); D. Porrini & R. Schwarze, *Insurance Models and European Climate Change Policies: An Assessment*, 38 EUR. J.L. & ECO. 7, 7-28 (2014); Anastasia Telesetsky, *Insurance as a Mitigation Mechanism: Managing International Greenhouse Gas Emissions through Nationwide Mandatory Climate Change Catastrophe Insurance*, 27 PACE. ENV'T L. REV. 691, 691 (2010).

68. David L. Brumbaugh & Rawle O. King, *Cong. Research Serv., RL33060, Tax Reductions for Catastrophic Risk Insurance Reserve 2-3* (Government and Finance Division, 2005), [https://www.everycrsreport.com/files/20050902\\_RL33060\\_c028452cc1b6d0ff8ccde4ef534b59e14cdf7046.pdf](https://www.everycrsreport.com/files/20050902_RL33060_c028452cc1b6d0ff8ccde4ef534b59e14cdf7046.pdf) (last visited June 29, 2021).

69. For a detailed discussion on comparative experience of catastrophe insurance, see HE, *supra* note 50, at 129-75.

70. The development of climate change adaptation policy, please see Yeh & Lin, *supra* note 55, at 21-22.

enhance Taiwan's resilience in several ways. It is a financial mechanism that can better redistribute disaster risks. It provides motive for people to take preventive action to avoid risks, which may push the government to generate progressive policies. The market mechanism may also generate necessary information to facilitate coordination between actors. Yet, challenges are entailed in the effort to design insurance against climate change for Taiwan. It is important to understand the development of disaster insurance in Taiwan before proposing a particular insurance scheme.

#### A. *The Development of Disaster Insurance in Taiwan*

The disaster insurance has been under-developed in Taiwan because of the coverage of the National Health Insurance and the state-centric disaster management.

The National Health Insurance system established in 1995 on the legal basis of the National Health Insurance Act provided as a social security scheme, yet it also enhanced the resilience of Taiwan against climate-related disasters. By providing medical service with an affordable premium, the National Health Insurance system shoulders a significant burden in treating physical and mental illness and represents a crucial mechanism of recovery and resilience in Taiwan.

Private insurance companies have been providing natural disaster insurance since 1980, although the market remains small. The average insurance coverage rate for natural disasters from 1980 to 2015 was 13.8%. The proportions of primary losses were 31% property, 37% public infrastructure, and 32% losses related to agriculture and fisheries. Industries and companies invest more in disaster insurance than households. Almost no insurance coverage is taken out on in public infrastructure and agricultural operations.

In 2001, because of the severe damage of the September 21 Earthquake, the Legislative Yuan amended Article 138-1 of the Insurance Act, imposing earthquake insurance on Taiwanese citizens who seek housing loans. The system is based on Japanese experience and requires insurers to underwrite residential earthquake risk. All individuals who apply for a housing loan are required to buy earthquake insurance. Thus, the Taiwan Residential Earthquake Insurance Fund was established to manage risk distribution and assume any losses that exceeded a particular threshold.<sup>71</sup> Since 2002,

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71. See Article 138-1, paras. 1-2 of the Insurance Act. Article 138-1, section 2 of the Insurance Act further prescribes "The portion of risk that exceeds the co-insurance underwriting assumption limit for non-life insurance enterprises shall be assumed by the Taiwan Residential Earthquake Insurance Fund, cede to domestic and/or foreign reinsurers, be assumed by the manner prescribed by the competent authority or assumed by the government."

insurance companies have attached a basic earthquake insurance premium to residential fire insurance. Currently, the coverage rate of earthquake risk insurance is 33.34%. Most insured select the basic premium that provides a maximum compensation of NTD150 million.<sup>72</sup> However, the current earthquake insurance has no requirement for prevention and mitigation and does not categorize the degree of risk. Therefore, it provides no economic incentive to encourage the insured to take protective measures.<sup>73</sup>

Private insurance companies also underwrite typhoon and flood insurance for both residential and commercial properties. Individuals may choose to attach typhoon or flood insurance to residential fire insurance and thus receive compensation if their property is damaged because of a typhoon or flooding. This insurance, however, does not include coverage for landslides, mudslides, or other consequential loss from a typhoon. Insurance companies determine premiums on a risk basis, according to factors, such as square footage and number of floors, that could affect vulnerability to a typhoon or flooding.<sup>74</sup> Among the 8 million houses in Taiwan, fewer than 30,000 are covered with insurance; the rate is a paltry 0.4%.<sup>75</sup> The insurance companies have been allowed to underwrite insurance on land subsidence and landslide disasters since 1999. However, the insurance rate is lower than 0.2% because individuals hesitate to pay the high premiums and sometimes the insurers refuse to underwrite such disasters due to high risk and anticipated loss.<sup>76</sup>

The under-developments in the insurance market indicate that Taiwanese people have little incentive to manage risk of uncertain loss through insurance despite of the high vulnerability to climate-related disasters. In addition to an underdeveloped awareness of climate change, paternalistic government intervention may impede the growth of insurance market. For example, in 2016, legislators, aware of the importance of instituting a sustainable mechanism to protect against frequent disasters, normalized postdisaster recovery measures, which further impeded the development of a climate change-related insurance market.<sup>77</sup> The 2016

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72. Hwei-Ling Huang (黃惠聆), *Tou Bào Shuài Piān Dī Huán Zài Kào Fā Jiù Zhù Jīn* (投保率低還在靠發救濟金) [Low Insurance Rate, and the Reliance on the Governmental Bailout] (China Times, Dec. 11, 2016), <https://www.chinatimes.com/newspapers/20161211000268-260114?chdtv> (last visited Jan. 13, 2020).

73. Hsin-Yu Shan (單信瑜), *Tóu Tǔ Shí Liú Zāi Hài Bǎo Xiǎn Zhì Dù Kě Xíng Xíng Zhī Yán Jiù* (土石流災害保險制度可行性之研究) [Feasibility Study of Debris Flow Insurance] 39 (Taiwan: Council of Agriculture, Executive Yuan, 2017), <https://tech.swcb.gov.tw/Content/Upload/Innovation/土石流災害保險制度可行性之研究.pdf> (last visited Aug. 23, 2019).

74. For example, Taichung suffers the fewest typhoons and enjoys the cheapest premiums. Yilan and Hualien are more vulnerable to typhoon, and residents are thus subject to expensive premiums.

75. Shan, *supra* note 73, at 44-47.

76. *Id.* at 50.

77. For example, Article 44-1, section 1 of the amendment prescribes that “Self-use residence

regulations may not only encourage high-risk construction and housing but also discourage the development of a disaster insurance market.

B. *Compulsory Catastrophe Insurance with Substantial Government Involvement*

Having set forth the three principles, we may further inquire into three aspects of climate change insurance: the type of insurance, whether it is compulsory or voluntary, and the role of the government. A preliminary analysis suggests that compulsory catastrophe insurance with substantial governmental involvement would be the optimal approach.

1. *Property Insurance or Liability Insurance?*

In the face of climate change, the global insurance industry has been trying to develop new strategies to not only facilitate climate change adaptation but also to mitigate GHG emissions more effectively. Insurance companies have identified three climate change-related risks: physical risks, liability risks, and transition risks.<sup>78</sup> This article is most focused on the physical risks of climate change-related extreme weather events and associated losses. Physical risks of climate change include economic losses that are set to arise from the increasing severity and frequency of extreme weather events as well as losses from long-term climate change. Insurance that aims to transfer the physical risks of climate-related disasters is usually categorized as “catastrophe insurance.”

This article suggests Taiwan establishes catastrophe insurance first. Catastrophe insurance provides a market mechanism for redistributing risks and reducing the vulnerability of at-risk individuals. Victims of a disaster can quickly get compensation for temporary relief and future recovery. By paying the insurance premium, the insured may also develop greater awareness of climate change and be compelled to take risk prevention actions in advance. While National Health Insurance can cover harm to health, catastrophe insurance can cover property losses.

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purchased by people from disaster-affected areas with a mortgage may have the house and land offset against the loan upon the consent of original loan financial institution if governments at all levels have determined that the residence is severely damaged during the disaster and can no longer be used. The interest of the leftover loan for the remaining years shall be subsidized by the Ministry of the Interior.” According to the law, owners of residences do not have to pay premiums but can enjoy unlimited loan exemptions and housing offsets without undergoing any review procedure. *Id.* at 71.

78. Physical risks refer to economic risks that could arise from direct or indirect impact due to increasing severity and frequency of extreme weather events, as well as long-term climate shift. Liability risks occur when victims of climate change seek compensation from the party/parties they blame. Transitional risks refer to financial risks resulting from the process of transition toward a low-carbon society.

Liability insurance is a useful mitigation mechanism because it targets major GHG emitters that may be legally liable for climate change hazards. The condition for well-functioning liability insurance is a clear legal rule that identifies major GHG emitters and their responsibility for such emissions. Although Taiwan enacted the GHG Reduction and Management Act in 2015, detailed rules regarding liability have not been fully developed.<sup>79</sup> The law may impose a tax on significant emitters in an effort to motivate them to reduce GHG emissions.

## 2. *Free Market or Compulsory Insurance?*

An efficient insurance market should be capable of reflecting the value of goods on the free market. However, high risk and small market scale will deter the development of catastrophe insurance.

The Insurance industry's balance sheets and profitability are highly exposed to risk trends and therefore insurability is the primary concern of insurers when they decide whether to underwrite policies.<sup>80</sup> Insurers must have the ability to identify, quantify, and estimate the risks and possible losses for any given insurable event in order to decide the appropriate premiums for risk.<sup>81</sup> However, the insurance market may not be sufficiently capable of absorbing the losses that are anticipated to occur with the increasing frequency and scale of climate-related extreme weather event.

In addition, a small market further struggles to redistribute risks. Although people are supposed to purchase insurance when they believe the premium is worth the hedge against the risk of loss from some incident most people are reluctant to insure low-probability but high-consequence disasters, especially when they assume they can rely on a government bailout and charity.<sup>82</sup> While the insurers may require excessively high premium to reduce their risk, they may deter potential customers and jeopardize the market.

In the consideration to balance consumers' burden and the capacity of insurance market, compulsory insurance is a better choice. By collecting higher premiums, compulsory insurance may enlarge the market size and increase its capability to redistribute risks. Compulsory insurance does not

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79. The article 18 of the GHG Reduction and Management Act introduces the emission trading system as the primary regulatory tool and delegates the Environmental Protection Agency to make rules for the market. Before the implementation of the Emission trading system, industries are not required to reduce GHGs emissions. Without legal liability, implementing liability insurance policy may encounter more challenges.

80. HE, *supra* note 50, at 63.

81. Howard C. Kunreuther & Erwann O. Michel-Kejan, *Climate Change Insurability of Large-scale Disasters, and the Emerging Liability Challenge*, 155 U. PENN L. REV. 1795, 1797-99 (2007).

82. HE, *supra* note 50, at 85.

mean a fixed premium. A fixed premium has negative impacts on the insurance market and deters insurers from appropriately evaluating the risks and possible losses. Consequently, the market cannot generate needed information and adjust its strategies to balance losses and benefits. The mistakes made with earthquake insurance must be avoided. Because the free market may demand higher premiums from people living in vulnerable areas or insurers may refuse to include them if they calculate premiums on a risk basis, the best approach may be compulsory insurance with partial subsidies for low-income families. Compulsory insurance enlarges the market base, and subsidies may balance the possible injustice of the market mechanism. Moreover, as the experience with earthquake insurance demonstrated, it is crucial to create some space for the insurers to calculate risk and adjust premiums. The market mechanism will be able balance costs and benefits and generate the necessary information to take preventive actions to avoid risk.

### 3. *The Role of the Government*

In a well-functioning market economy, the government should restrain itself from intervening in the market. However, the insurance market in Taiwan will likely fail without government support because of the insurers' insufficient capacity, the at-risk population's unwillingness to buy insurance, and inadequate information. To identify a proper role for the government in the climate insurance market that does not jeopardize the market is also crucial. The government may do several things to support the insurance market.

First, the government should establish a legal basis for compulsory catastrophe insurance and require citizens who own real estate to purchase catastrophe insurance. The insurer may decide the premium according to the value of the property and its risk of being affected by climate change--related disasters; low-income households may apply for a subsidy.

Second, the government should invest in researching and collecting information regarding the changing climate. An insurer will hesitate to underwrite catastrophe insurance if it lacks sufficient information to evaluate insurability. Performing risk assessments, risk zone mapping, and other research regarding climate change and its hazards are necessary preconditions for offering catastrophe insurance. The Disaster Prevention and Protection Expert Consultation Committee and the National Science and Technology Center are presently engaged in efforts to generate the aforementioned information, thereby providing a preliminary basis for catastrophe insurance. The government should further coordinate the information with the research generated under the National Climate Change

Adaptation Framework Policy to help insurers set accurate risk-adjusted premiums.<sup>83</sup>

Third, it is crucial to provide a safeguard for insurers. Faced with an increasing number of climate change-related disasters, an insurer may seek reinsurance to reduce its burden. However, it is unclear whether the reinsurance market can provide a sufficient safeguard for Taiwanese insurers because the reinsurance market for climate change policies is still in its infancy. Before the global reinsurance market can provide a mechanism for domestic insurers, the government may need to play the role of reinsurer. As the earthquake insurance system demonstrated, a government-sponsored fund could encourage the establishment of a catastrophe insurance market.

Moreover, the government should ensure fairness to the most vulnerable groups. The most vulnerable people may suffer from unfairness in the catastrophe insurance market. In Taiwan, for example, some indigenous and impoverished people who reside in the vulnerable areas such as mountainous and coastal areas could suffer more in disasters and usually produce less GHG emissions. In a market-based insurance scheme, they may be requested a higher premium or be refused by an insurer if it considers the risk of loss to be too high. It is essential for the government to ensure that market-based insurance will not exacerbate the difficulties of the most vulnerable groups.

## V. CONCLUSION

This article reviewed the development of the disaster risk management system in Taiwan and proposed a catastrophe insurance system with the capacity to adapt to the climate change era. By outlining Taiwan's history of dealing with disasters, this paper made it apparent that Taiwan's modern disaster risk management system evolved from an original paternalistic structure into a system influenced by democratization politics. The experience of Typhoon Morakot Typhoon demonstrated that disaster politics may impede the function of the disaster risk management system. Disaster politics exacerbates the ineffectiveness of the fragmented network, leads to financial deficits, underemphasizes the importance of prevention, and creates passive citizens.

The current disaster risk management system in Taiwan may be incapable of dealing with future extreme weather events in the climate change era. This article proposes integrating climate change adaptation provisions into disaster law to reduce the problems of politics and insurance. In light of previous experience with disaster-related insurance, this article

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83. J. DAVID CUMMINS & O. MAHUL, CATASTROPHE RISK FINANCING IN DEVELOPING COUNTRIES: PRINCIPLES FOR PUBLIC INTERVENTION 76-77 (2009). *See also* HE, *supra* note 50, at 63-64.

suggests a catastrophe insurance market in which the government is involved to prevent market failure. Catastrophe insurance can efficiently redistribute climate change risks, increase citizens' awareness of disaster mitigation, and also reduce the uncertainty of politics.

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# 氣候變遷時代的災害政治、法律和保險：以臺灣案例為中心

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## 摘 要

氣候變遷引起的災害越來越頻仍且嚴重，挑戰各國災害防救體系的能量。法律學者雖然投入探討災害相關法律的改革，卻因為未能充分注意到氣候災害的政治脈絡，以致無法有效回應挑戰。本文以台灣為例，分析災害防救體系如何在災害、政治及法律的複雜互動中演進。本文主張，過去台灣在儒家文化影響下，發展出家父長色彩的災害防救制度，持續影響台灣目前災害防救體制的運作。國家被視為承擔災害防救的主要角色，而忽略市民個人責任及市場機制的潛在功能。本文主張，災害防救系統應該隨氣候變遷而調適，建議強化氣候保險的建置以建立台灣因應氣候變遷更強的韌性。

**關鍵詞：**災害政治學、氣候變遷、氣候保險、災害防救法、調適