

# MODES OF NETWORK GOVERNANCE IN DISASTER RELIEF: THE CASE OF THE BANGKOK FLOOD RELIEF, 2011

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## Abstract

*Purpose.* The purpose of this paper is to map and explore network governance in a disaster relief situation. The case of the Bangkok Thailand flood relief of 2011 was used to examine network governance in four relief activities: food activities, relief items activities, medical service activities, and rescue activities.

*Design/methodology/approach.* We used multimethod research combining Social Network Analyses (SNAs) and in-depth interviews with 16 organizations and 29 key informants representing state organizations, the private sector, Local Non-Government Organizations (NGOs) and the social sector involved in the relief activities of the Bangkok flood relief in 2011.

*Finding.* We found contrasting modes of network governance in the four Bangkok flood relief activities. The networks within food and relief items activities were more connected, with the local NGOs, university, military and voluntary sectors being the

key stakeholders, while the networks within medical services and rescue activities were segregated representing specialization roles within state organizations, the private sector, local NGOs and social sectors in the medical and rescue activities.

*Practical implications.* The findings highlight the importance of identifying patterns of network governance during disaster reliefs as it can help policy makers in formulating an effective disaster reliefs management.

*Originality/value.* This paper for the first time presents the pattern of network governance in the context of disaster relief activities using Bangkok flood relief 2011 as a case study.

**Keywords:** disaster management; network governance; social network analysis; Bangkok flood relief.

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## Introduction

Network governance has become a prominent phenomenon in governance and public management studies in recent decades (Emerson, Nabatchi & Balogh, 2012; Provan & Kenis, 2008). Provan and Kenis (2008) define network governance as networks among legally autonomous organizations that work together to achieve not only their own goals but also a collective goal. Ansell and Gash (2008) explain that network governance relates to a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process or in managing activities that are formal, consensus-oriented, and deliberative, and which aims to make or implement public policy or manage public programs or assets. This definition stresses six important criteria: (1) the forum is initiated by public agencies or institutions; (2) participants in the forum include non-state actors; (3) participants engage directly in decision-making and are not merely “consulted” by public agencies; (4) the forum is formally organized and meet collectively; (5) the forum aims to make decisions by consensus (even if consensus is not achieved in practice); (6) the focus of the collaboration is public policy or public management. Rhodes (2017) posits that network governance requires various actors such as citizens, businesses, and non-profit organizations to become collaborative producers (co-producers) of public services.

In the context of disaster management, increasing the number of actors involved in humanitarian aid and disaster relief operations urges a need for better network governance, and as as Pettit and Beresford (2009) posit, a growing number of humanitarian aid and relief organizations sometimes fail to achieve effective and efficient disaster relief operations. A vast network of emergency relief and development organizations leads to obstacles. For example, emergency relief organizations are often operated by an isolated actor that displays individual, societal responses and is crisis-oriented. Other issues sometimes found

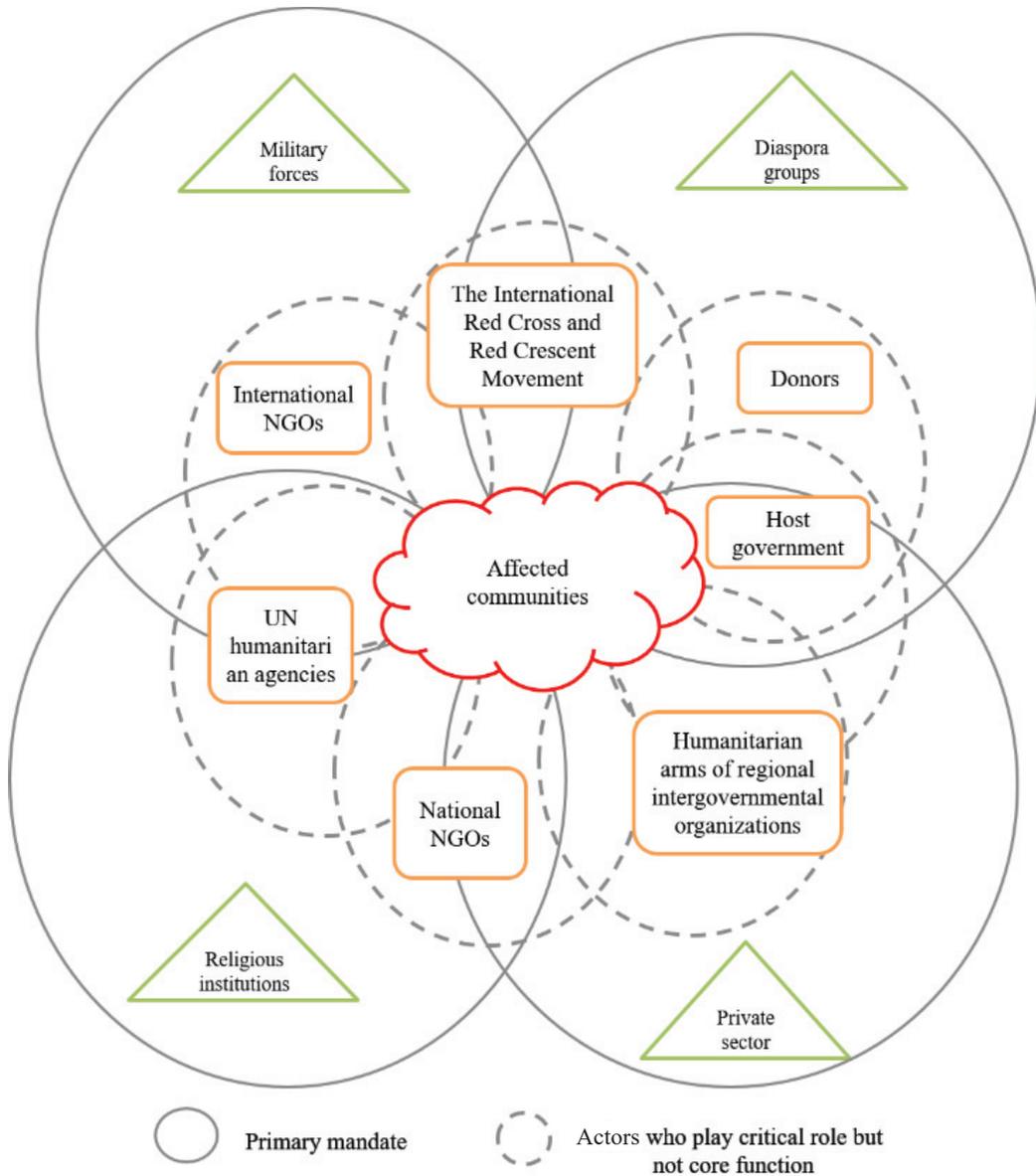
are a lack of coordination among various actors, which leads to duplicity in the operation, overspending of resources, tensions among the different groups involved, and delays in relief to the affected citizens. International organizations, governments, the military, local communities, the private sector, and academics sometimes have been unable to collaborate and work together during disaster reliefs (Moore, Eng & Daniel, 2003). Hence, effective network governance among international actors and local actors, among different levels of governance, and among public sectors, private sectors and NGOs are needed to achieve an effective relief operation. As the World Humanitarian Summit 2015 noted, aid actors should work with local and national authorities to enhance capacity rather than replace local and national capacities (Churruca-Muguruza, 2018).

Despite the increasing involvement and roles of various international and local actors within humanitarian aid and disaster relief operations, there are minimal empirical studies which identify and explore modes of network governance within such operations (Ahrens & Rudolph, 2006; Howes et al., 2015; Koliba, Mills & Zia, 2011). Most of the existing studies that account for humanitarian aid and disaster relief operations are conceptual or theory-based (Howes et al., 2015). This study aims to empirically examine modes of network governance in a disaster relief operation and address the gaps in the disaster relief operation. We used the case of the Bangkok Thailand flood relief in 2011 to examine patterns of network governance in four relief activities; food activities, relief items activities, medical service activities, and rescue activities. The four areas of disaster relief were expected to show the difference in network governance characteristics and relationships among the actors and give a different point of view on the disaster relief operation, which also included non-humanitarian aid organizations. SNA was used to map the modes of network governance, while in-depth interviews were used to explore the roles and relationships among key actors in the networks.

## Network governance structure in humanitarian aid: a conceptual framework

To identify modes of network governance, we used the conceptual framework from the humanitarian aid operation network which illustrates the general structure of network governance within a humanitarian aid operation (Taylor et al., 2012) (Figure 1). This framework explains that the humanitarian aid and disaster relief operation networks can be divided into two groups; key actors and support actors. Key actors mean actors who primarily respond to humanitarian aid (Taylor et al., 2012). They operate with other actors or share finance. Most of them operate with the same goals and humanitarian aid principles. Key actors include local NGOs, International NGOs, United Nations humanitarian agencies, the International Red Cross and Red Crescent Movement (ICRC), agencies in the affected country that are responsible for the crisis, humanitarian organizations in the region, foreign donor governments and agencies. The function of the key actors consists of providing a quick response to sudden-onset disasters that over-capacitate the national agencies, and responding to the basic needs of the affected people in the case of a failure response of the national agencies (Taylor et al., 2012).

Figure 1: Humanitarian aid operation framework



Source: Taylor et al. (2012) authors adapted.

Secondly, supportive actors refer to organizations that do not have humanitarian actors as a core function (Taylor et al., 2012). They can play an important role in a humanitarian response by cooperating with other key actors of humanitarian aid, i.e. building the capacity of disaster preparedness, recovery, and resilience at the local level, and distributing victims to humanitarian aid actors. In any humanitarian assistance operation, the national agencies are the main actors who cope with the crisis and achieve the needs of the affected people by using either existing or private resources, without seeking international humanitarian aid. International humanitarian aid is the supplementary support

in order for the national capacity to deal with the crisis. Accordingly, the operation of humanitarian aid in different cases needs to apply different functions suitably with hazard scales, and crisis context. The size and types of these will vary in each crisis.

## Research Methods

We used multimethod research combining social network analyses and in-depth interviews to achieve the study aim. SNA was used to identify modes of network governance among actors within four disaster relief activities (Prell, 2012). SNA was the suitable method for mapping the structure of networks as Serrat (2017) explains that power no longer resides exclusively (if at all) in states, institutions, or large corporations but is located in the networks that structure society. SNA seeks to understand networks and their participants and has two main focuses: the actors and the relationships between them in a specific social context. UCINET software was used to analyze network data collected from interviews with key stakeholders (De Nooy, Mrvar & Batagelj, 2018; Freeman, 2017; Wasserman & Faust, 1994). To explore roles and relationships among actors within network governance, we used in-depth interviews. The interviews were conducted using the snowball technique (Trost, 1986), starting with the Thai Red Cross, then Banpu Public Company Limited, the Coca-Cola Foundation, Friends (of “PA”) that cooperate with the Thammarasamee Foundation, ThaiPBS, the Navy, and CU. Following this, CU mentioned the Por Teck Tung foundation and the military. After interviewing the military, then we interviewed DDPM and LTA, NIEM, and the Ministry of Foreign Affairs. In total, 16 organizations and 29 respondents were interviewed.

## Findings

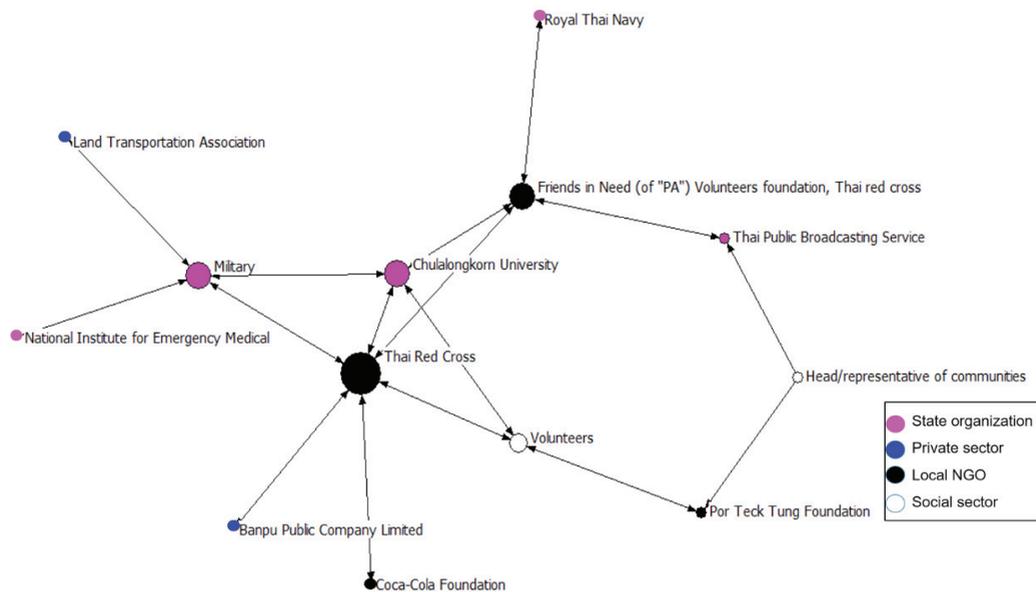
In the case of the Bangkok flood relief in 2011, the Thai government decided to promulgate the Government Administration Act B.E.2534 (1991) instead of the national disaster prevention and mitigation plan B.E.2550 (2007); therefore, the organizations in charge of the national plan did not have authorization. The relief operation was operated by humanitarian aid organizations and government organization base on their responsibility. The relief operation actors attempted to develop existing cooperation. In this paper, we focus on four reliefs activities: food, relief items, medical service, and rescue activities.

### *Networks in food relief activities*

Figure 2 describes the mode of networked governance within food relief activities. Here we found thirteen key actors: Banpu Public Company Limited, the Coca-Cola Foundation, Chulalongkorn University (CU), the Department of Disaster Prevention and Mitigation (DDPM) Thailand, Friends in Need (of “PA”) Volunteers Foundation, Thai Red Cross Friends (of “PA”), Head/representative of communities, Land Transportation Association, the Military, the Ministry of Foreign Affairs, National Institute for Emergency Medical (NIEM), the Por Teck

Tung Foundation, the Royal Thai Navy, the Thai Red Cross, the Thammaratsamee Foundation, and food activity volunteers in the Bangkok flood relief 2011. There were four clusters in the network: five actors representing state organizations, four actors from NGOs, two actors from the private sector, and two actors from social sectors. The color of the nodes in the social network was used for identifying different clusters; pink for a state cluster, blue for a private sector cluster, black for local NGOs, and white for a social sector cluster.

**Figure 2: Modes of network governance within food activities in Bangkok flood relief 2011, Thailand**



The Thai Red Cross was the key actor in the food activity response during the disaster. They produced ready-to-eat food for the affected people and affected organizations, and also delivered it. A mobile kitchen bureau was responsible for manufacturing ready-to-eat food and cooking in bulk to provide for the number of operators. The Thai Red Cross contacted its volunteer base who in turn persuaded their friends and relatives to help too. In addition, the Thai Red Cross broadcasted their activities through their website, media, and digital boards to motivate the general public to become volunteers. Volunteers helped to prepare ingredients, wash and chop fresh vegetables and meat, cook or help the chefs, pack food, combine a bag of rice and a bag of food, count the packed food and put into big plastic bags, and then convey it to trucks. Most of procurement came out of the Thai Red Cross budget. Moreover, the Thai Red Cross received more money and food items such as seasonings, fresh ingredients, frozen food and bottled drinking water from supportive private sector organizations and individuals. These supportive organizations included the Coca-Cola Foundation, Thailand that had MoU with Thai Red Cross after the 2004 Tsunami

2004; the foundation donated bottle drinking water, money, support trucks, and volunteer staff. Another was the private sector Banpu Public Company Limited, Thailand which supported trucks and drivers for a month covering all expenditure such as fuel, maintenance expenditure, the wage of drivers, and so on. The company is responsible to Thai Red Cross directly.

In terms of food delivery, the Thai Red Cross worked with volunteers and sometimes operated with the military. The military came with trucks and human resources. Operation with Friends was the affiliation of the Thai Red Cross that had the Royal family as its supreme executive. The foundation responded to flood relief but only had volunteers as its leading operators. In the case of the Bangkok flood relief, the Thai Red Cross supported the foundation in its delivery fresh ingredients because the foundation did not have enough staff and space for producing ready-to-eat food in large amounts; therefore the foundation asked Chulangkorn University (CU) to help with its manufacturing section. CU was located near both the foundation and the Thai Red Cross, plus there were human resources and a large space. CU agreed to produce ready-to-eat food for the foundation. The foundation took the CU team to visit the affected area at Ayutthaya province to survey the food production at its temporary location. The CU team tried to collect more information from others that with experience, then set up a kitchen at the central space of the university, called Sara Phra Kaew. In the beginning, CU set up one tent for cooking and used the next building as an ingredient warehouse. CU cooked once a day to provide for lunchtime, with menus using chickens, vegetables, and eggs because of the low cost and also because these foods would serve all religions and all ages.

The amount of food produced depended on the order from the Friends (of "PA"). The majority of the operators were volunteers who were CU students, CU staff, and, in the main, the general public. The public watched the news on television about the activities of CU, and, after seeing that, they came directly to work with CU. The activities of CU did the same with the Thai Red Cross. CU produced food for a month, from 1,100 boxes to 43,896 boxes, and the foundation supported with money, a big oven for cooking rice, and liaising between CU and the Thai Red Cross. CU did not respond for delivery as the main. Therefore the delivery section was operated by the military and others connected to Thai Red Cross and the foundation. The military and others only took ready-to-eat food once a day. Sometimes CU members joined in these activities.

As for the operation of the military itself, it operated in the field with NIEM along with the Friends (of "PA") through the Thai Red Cross for the delivery of ready to eat food. Sometimes, the military asked for more support from LTA. LTA supported trucks for the military when military request. In the field operation, the military surveyed the affected areas with other organizations. After that, they set the operation plan. Sometimes the organizations would join others for food delivery, such as NIEM. Another organization delivering ready-to-eat food of Friends (of "PA"), the Royal Thai Navy, did it only for a few days to assist the foundation by taking ready-to-eat food from CU,

while the Navy produced some food and delivered it to affected households around the Navy's office at the same time.

Thai PBS operated as the existing network of Friends (of "PA") for cooperation among field implementers and affected people and between organizations and organization actors. When Thai PBS staff operated in the field, they needed to meet or contact a head/representative of affected communities to get information on the number of affected households and communicate information on the flood and transport situation. Similar happened when the Por Tec Tung foundation would deliver food, and the foundation would contact the head/representative of the affected communities. On the other hand, in some cases the head/representative of the affected communities directly contacted the organizations.

A statement by the head of the relief section, bureau of relief, civil affairs office, department of Naval civil affairs mentioned that the survival bags of Friends (of "PA") were packed at the Naval flying section in Bangkok and Sattahaep naval bases, and that the Navy took them by trucks and delivered them. In terms of the Thai Red Cross, when most disasters occur, the Navy has informed that they want a certain number of survival bags to go to the Thai Red Cross, then make an appointment for delivering to affected households, especially in affected areas that are located near the Chaopraya River and its distributaries.

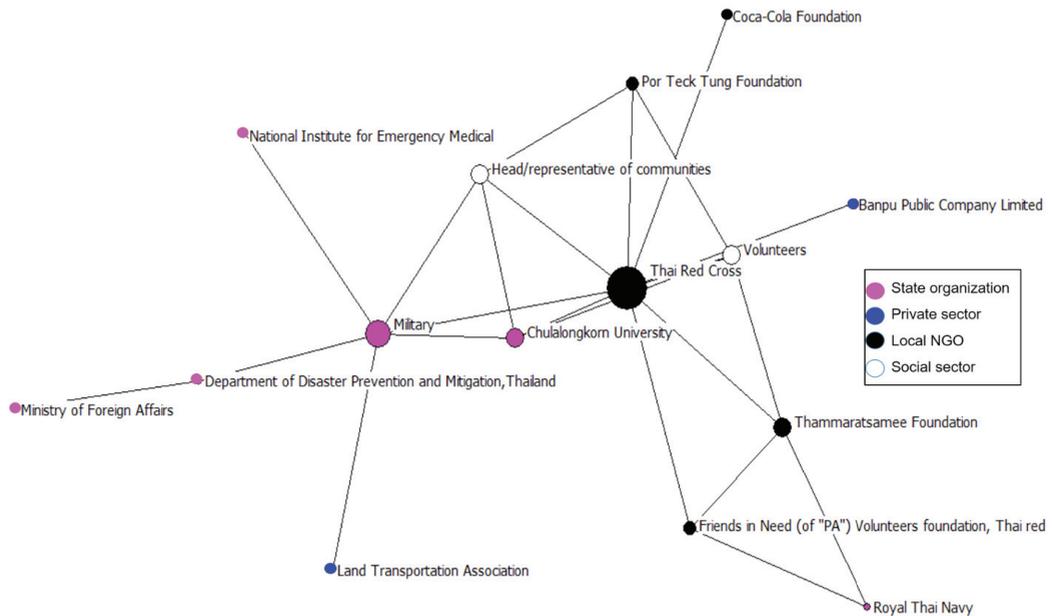
The central actors include two main manufacturers; the Thai Red Cross and CU – the two main cooperators; and Friends (of "PA") and the military. A week into the disaster, affected people needed food. The network shows the actors went to the manufacturers and cooperators. The well-known actor in disaster relief in Thailand is the Thai Red Cross which leads the public and organizations think of the Thai Red Cross first. Therefore, the majority of actors approach the Thai Red Cross. In the Bangkok flood of 2011, there was another state organization – CU – which produced much of the ready-to-eat food based on the requirements of Friend (of "PA"), and even though CU was not a relief organization, it could be one of the important actors regarding food activities. CU was only responsible for producing. Therefore, CU needs other organizations for dealing with delivery.

#### *Network in relief items activities*

Figure 3 describes the mode of networked governance within relief items activities. Within these activities we found fifteen key actors: Banpu Public Company Limited, the Coca-Cola Foundation, Chulalongkorn University, the Department of Disaster Prevention and Mitigation (DDPM) Thailand, Friends (of "PA"), the head/representative of communities, the Land Transportation Association, the military, the Ministry of Foreign Affairs, NIEM, the Por Teck Tung Foundation, the Royal Thai Navy, the Thai Red Cross, the Thammaratsamee Foundation, and volunteers. There were four clusters in the network: six actors represent state organizations, five actors are from NGOs, two actors are from private sectors, and two actors are from social sectors. The Thai Red Cross is the most important actor in the network.

The Thai Red Cross provided survival bags by procurement mostly out of the Thai Red Cross budget and also with a donation from private sectors and individuals which led the Thai Red Cross to become one of the donation hubs for relief items. Packing survival bags started with classifying the group of items checked by expiry date. In terms of clothes, they classified for gender and condition. The Thai Red Cross prepared survival bags for distribution by themselves based on direct requests from affected people and the requirement of other organizations. They not only supported with survival bags but also with ingredients for cooking such as donating seasoning for some affected areas that had set up temporary kitchens. The formal supportive organization of the Thai Red Cross was the Coca-Cola Foundation, Thailand comprising of three beverage companies. The organization could help in two ways: the first foundation donated bottle drinking water while the second supported the logistic system. The logistic system was a strong point of the foundation because the three companies always delivered to many shops in various areas through Thailand. Another supportive organization that directly proposed their willingness was Banpu Public Company Limited which supported with trucks and drivers and with some expenditures to the Thai Red Cross.

**Figure 3: Mode of networked governance within relief items activities in Bangkok flood relief 2011, Thailand**



The Thai Red Cross managed the requirements of affected people and affected organizations, who requested it directly from them. They attempted to gather groups in the same affected area, for example, the same village, same condominium, or same apartment for assistance in the same day, the exact number of affected people, and to contact the head/representative of commu-

nities. On the other hand, the organization could contact the head/representative of communities for getting information such as the flood or transport situation, and made an appointment. This was similar to CU, but there were not many cases, whereas the military and the Por Teck Tung Foundation would contact the head/representative of communities when they surveyed the area. The military was cooperative when it received calls from affected people or affected organization.

The military would contact and authorize organizations. The military, navy and NIEM conveyed and delivered survival bags at the request of Friends (of "PA"). The survival bags were packed at the navy base in Bangkok and Chonburi province. Friends (of "PA") persuaded the Thammaratsamee foundation from Chonburi to survey and deliver some survival bags. In terms of the Por Teck Tung foundation, it operated for packing and delivering survival bags using the foundation's volunteers.

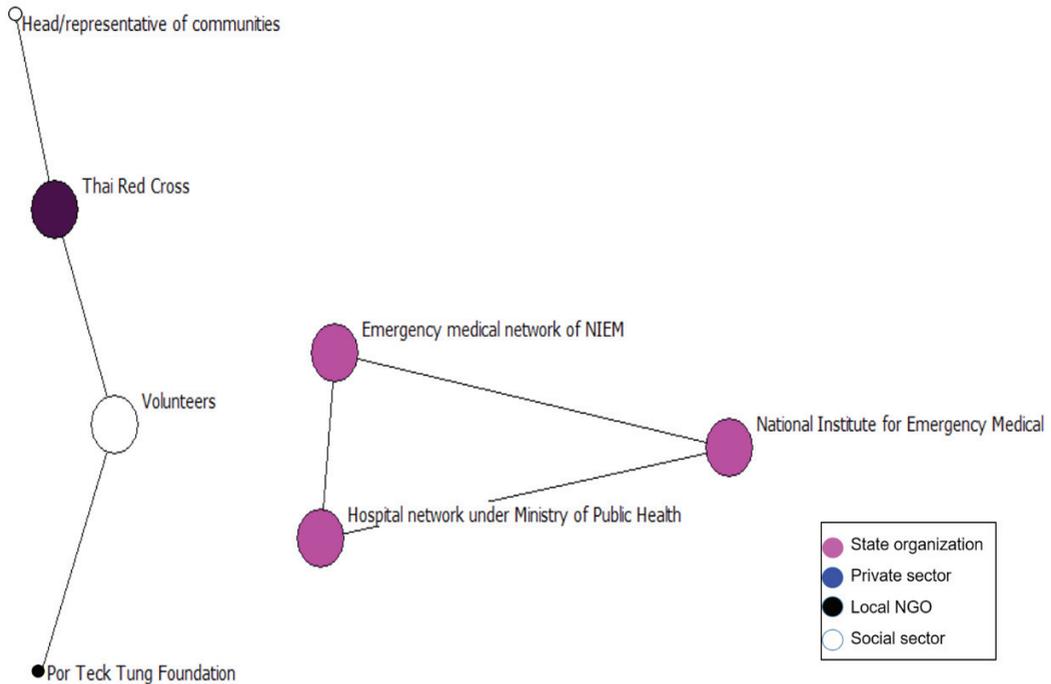
Other organizations who supported the warehouse of relief items was the Department of Disaster Prevention and Mitigation (DDPM). DDPM received relief devices from the private sector and donations through the Ministry of Foreign Affairs such as life jackets, boats, solar flashlights, flashlights, generator, water pump, plastic booths, and so on. DDPM made lists of the relief devices before distribution to affected people or affected organizations. The Ministry of Foreign Affairs was a coordinator of the Thai government with government-to-government assistance efforts internationally and a central gathering data organization for foreign donations.

The functions of humanitarian assistance were, as a main principle, to provide a rapid response and the basic needs of affected people. Therefore, food and relief items were realized by the general public and donors. When a disaster has occurred, the general public and donors think of organizations that were the main responsibility for relief at first. In the case of relief items activities, we found that outside assistance which came from international organizations, foreign governments, INGOs, and the private sector was always support finance, food, dried food, relief items. Three organizations have key roles: the Thai Red Cross, Friends (of "PA"), and the Por Teck Tung foundation who had routine relief items responsibilities. Others joined in the operation because of informal persuasion and the cooperation of responsible actors. On the other hand, some attempted to seek relief items sources to take to affected people. Therefore, there is the highest number of people and organizations involved in relief activities.

#### *Network in medical service activities*

Figure 4 describes the mode of networked governance within medical service activities. Within these activities, we found seven key actors: the emergency medical network of NIEM, the hospital network under the Ministry of Public Health, the head/representative of communities, NIEM, the Por Teck Tung Foundation, the Thai Red Cross, and volunteers. There were three clusters in the network: five actors representing state organizations, two actors from NGOs, and two actors from social sectors.

**Figure 4: Mode of networked governance within medical service activities in Bangkok flood relief 2011, Thailand**



Thai Red Cross provides medical services both in normal and crisis situations. In a crisis, medical teams consisted of two or one doctors with nurses, or nursing assistants. There were two or three medical service teams for the Bangkok area. They went by trucks or boats and served affected people at homes, schools, temples, and temporary shelters. The service provided first aid, medical checkups, and offered advice on how people should take care of themselves during the flood. The trucks or pontoons contained survival bags and medicine kits. In some places the trucks could not reach so far into the flood area. Therefore, the medical staff had to use boats with engines. In terms of a home medical service, the medical teams providing basic checkups gave general medicine as well as medicine for patients with chronic diseases.

Besides this, the medical teams offered healthcare advice for both during the flood, for example, for Hong Kong foot and Leptospirosis, and how to avoid accidents. In terms of a mental health service, this was of importance to the medical services because of stress to people in a prolonged period of flooding. Therefore, the medical team motivated those people to go out and get refreshments and to participate in activities at temporary shelters such as singing, dancing, playing games, and talking with others. In terms of packing medicine kits, this was operated by Thai Red Cross staff and volunteers.

The head/representative of communities would inform the number of patients in communities later after the first call, then the Thai Red Cross would arrange a schedule and made an appointment with the head/representative of com-

munities. The Por Teck Tung Foundation provided a medical service as one of its routine jobs. In a crisis, they still served the same for basic medical checkups and gave out medicine kits. The head of the medical community department mentioned that the medical service department provided general checkups: for blood pressure and classified diseases. They also provided the dental unit for children between 2 and 7 years old. In addition the measured blood pressure and glucose level using fingertip samples. Then the medical team gave recommendations and healthcare/diseases brochures. Sometimes they gave free glasses for both short- and long-sighted. The Por Teck Tung foundation was an affiliation of Hua Chiew hospital where it could produce traditional medicine of good quality cheaply.

NIEM operated a medical service along with its other responsibilities by cooperating with the emergency medical network of NIEM and the hospital network under the Ministry of Public Health. When NIEM got a call from affected people or other organizations, then NIEM cooperated with two others. The emergency medical network of NIEM took patients to the hospital network under the Ministry of Public Health which in turn responded with cures and/or treatment.

The medical activities network showed that it provided basic medical services such as blood pressure checks, gave general medicine and some medicines for chronic disease patients, and gave advice for healthcare during the flood for both, for example, Hong Kong foot and Leptospirosis, how to avoid accidents and mental healthcare guidance. The medical team motivated people to go out and get refreshments and participate in activities at temporary shelters. Basic medical operation worked separately from the emergency medical service network. The small network presented that all actors served emergency medical duties as routine but also gave some assistance to medical services as support staff within survey teams. This means that the emergency medical service actors did not operate fully in medical service activities.

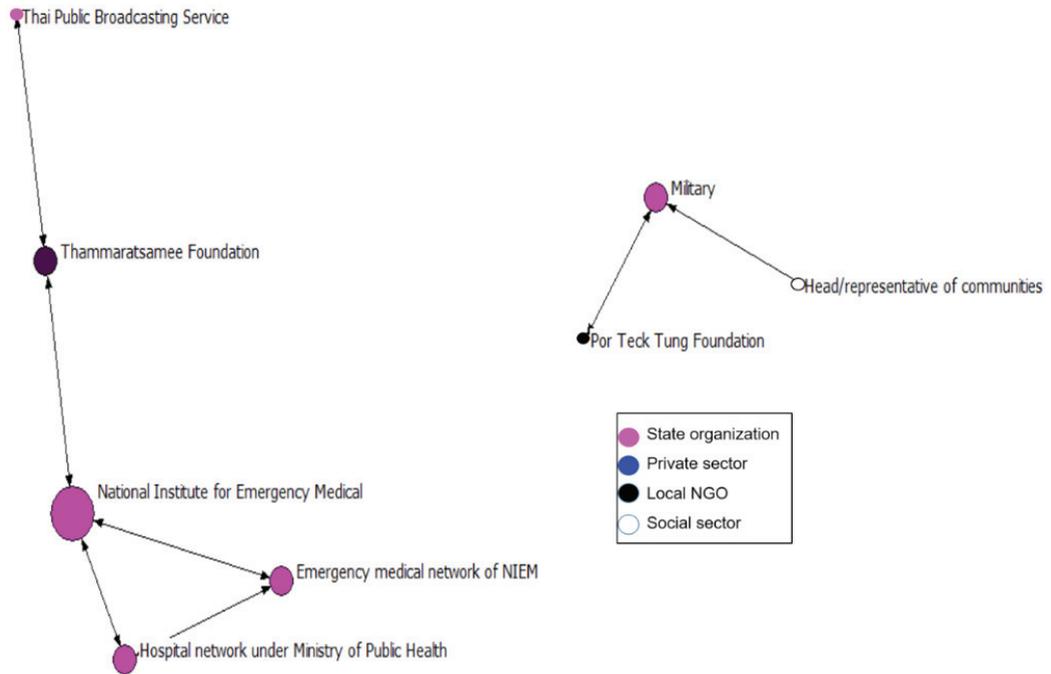
#### *Network in rescue activities*

Figure 5 describes the mode of networked governance within rescue activities. Within these activities we found eight key actors: the emergency medical network of NIEM, the Thammaratsamee Foundation, the head/representative of communities, the hospital network under the Ministry of Public Health, the military, NIEM, the Por Teck Tung Foundation, and the Thai Public Broadcasting Service. There were three clusters in the network: five actors representing state organizations, two actors from NGOs, and one actor from social sectors. The National Institute for Emergency Medical and the military were the key actors in these activities.

The main responsibility of NIEM was moving patients or those who were bedridden to the hospital by cooperating with other organizations, and, at a meeting of the support administration and accident command for flood and landslide center, it was assigned to be the commander of emergency medical service. NIEM could mobilize the emergency medical service network through Thailand. Operationally, NIEM was the main point of contact for rescue through

hotline 1669. A statement by the Director of the Bureau of Emergency Medical Prevention Support stated that, in terms of emergency medical service, the commander was NIEM, and it operated with their network and hospital network. The NIEM network brought ambulances with complete communication devices and staff on standby at NIEM's office, then once it received emergency information NIEM would cooperate with the NIEM network and the hospital for delivery of emergency or bedridden patients.

**Figure 5: Mode of networked governance within rescue activities in Bangkok flood relief 2011, Thailand**



The Directorate of joint civil affairs was cooperated when military worked in the field or got calls from affected people about rescues or moving people to safe places. The military would cooperate with rescue organizations such as the Por Teck Tung foundation. Also, the military moved patients from a flooded hospital to a new hospital and provided transportation for affected people. The military sourced information from the head/representative of communities.

The rescue activities network showed that there are two subnetworks; the big network presented actors who had rescue activities as routine and actors who had no experience before such as Thai PBS, even though it was not a rescue organization. It evidenced the working together of state actors with an NGO. The small network presented that the majority operation of the NGO was after contact came from the military. The NGO operated in the field only; it did not contact the head/representative of communities directly.

## Discussion and conclusion

The main purpose of this study is to map and explore network governance in four disaster relief activities; food activities, relief items activities, medical service activities, and rescue activities in the Bangkok Flood of 2011. We found a contrast mode of network governance in those four disaster relief activities. The local NGO had the key actors for food activities and relief items activities, while state organizations were the key actors for medical service activities and rescue activities. From our findings, the cluster network showed local NGOs to be key sources in food activities and relief items activities. In contrast, the segregated network showed that medical service activities and rescue activities represent specific and specialized functions of key actors. This study is one case which shows that humanitarian aid actors and non-humanitarian actors can operate in harmony as a network (Pettit & Beresford, 2009; Taylor et al., 2012).

Taylor et al. (2012) explain that the humanitarian aid and disaster relief operation networks can be divided into two groups; key actors and support actors. In the context of Bangkok flood relief in 2011, we found some key roles of key actors, i.e., to provide a quick response to sudden-onset disasters that over-capacitate national agencies, and to respond to the basic needs of affected people in the case of a failure of national agencies to respond. These functions seem to relate to the operation of outside country organizations. This was quite different from the Bangkok flood relief in that that was not a sudden-onset disaster, and the Thai government could handle the situation.

The supportive actors play an important role in the humanitarian response by cooperating with other key actors regarding humanitarian aid and for building capacity of disaster preparedness, recovery and resilience at the local level, and distributing affected people to humanitarian aid actors. Our findings show that the private sector has supportive actors for existing support devices, human resources, and for donating money or items. Social sectors refer to the head/representative of affected communities and the general public who were volunteers in the various operational organizations. Some operational actors of the Bangkok flood relief in 2011 show similarities with literature reviews about the humanitarian aid network and which shows the key actors in disaster management; mitigation, preparedness, response, and recovery, including international NGOs, The International Red Cross and Red Crescent Movement (ICRC), UN agencies in humanitarian terms, local NGOs, humanitarian organizations in regional, affected government, and donors. However, there were some different points with the Bangkok flood relief 2011 case; this case included social sectors. Besides, there was no ICRC involvement in the Bangkok flood case nor other international organizations for relief operations because the Thai Government has limited support from international organizations. It conformed to the fundamental humanitarian aid principle, the UN Resolution (strengthening or the coordination of humanitarian emergency assistance or the United Nations, approved in 1991), and other standards defined whereby international assistance needed acceptance or request from the affected government (Harvey, 2009; Taylor et al., 2012).

The characteristic of collaborative management in the Bangkok flood 2011 case showed the direction in food activities and relief items activities went toward to main resource actor. The centrality actor in both activities was the humanitarian actor, while the second centrality actor in food activities was not a humanitarian aid actor. In terms of relief items activities, the second centrality was a cooperator. The structure of the medical service activities network was divided into two networks; the big network showed the working together of humanitarian aid actors such as an NGO with the social sector such as volunteers for providing basic medical services. The small network showed the working together of an emergency medical service network that served some basic medical services. The size three actors were similar, which means that the three of them coordinate with each other. The structure of rescue activities was also divided into two networks; the big network showed key function organization operated with a state organization network and an NGO that had a key function regarding rescue. The small network showed a key actor who cooperated with the NGO and the social sector. In brief, various actors could operate well even though they did not have any contracts with or obligation to each other.

From previous cases of emergency disaster networks, one such network, for Hurricane Katrina, operated throughout the emergency period as a centralized administration. It could not deal with the emergency operation (Kettl, 2006). Kettl (2006) argued that a decentralized structure can deal with a case of emergency management such as with Hurricane Katrina. Organizations can run decentralized administration in a normal situation, however, organizations should adopt decentralization administration in emergency situations. The network governance during the Bangkok flood relief in 2011 showed the centrality of structure, but this did not mean the centralization of power, on the other hand, it means it was an operation in decentralized form because there was no hierarchy command, and the centrality actors attracted other actors because they were the main resources or specialized in each activity.

In some cases of emergency management the government sought assistance from others such as private sectors, as in the case of the U.S. flood in 1927, while in some cases around the world international NGOs were the key participants during the emergency period (Eikenberry, Arroyave & Cooper, 2007); this occurred during the Bangkok flood relief in 2011 too. When various actors operate in the same activity, they can share experience and information that leads them to decide the operation plan and future together. Some actors decide to build formal cooperation for the long-term. Taylor et al. (2012) summarized that communication is one of the most important factors before, during, and after a disaster, such as sharing warnings and information about the alert and broadcasting on television, radio, internet, mobile phone, and so on. The information can flow from higher authorities to the public, among agencies, and across agencies. Sharing information during the Bangkok flood relief 2011 took place in four types of activity and was one of the key enabling factors. One important actor who gathered and broadcast to the public was Chulalongkorn University (CU), which broadcast information about the flood situation and necessary information during the flood via the official CU website, short messaging services,

radio, and information boards to CU members and the public. Working together can eliminate redundancies in disaster management. Network formation is necessary to reduce constraint factors and increase sharing resources (Agranoff, 2007). The network governance during the Bangkok flood is one case which highlights the importance of working as a network. A network can enhance the effectiveness of the relief operation by non-experienced or non-humanitarian actors, and actors can share resources through a network (Ahrens & Rudolph, 2006; Pettit & Beresford, 2009).

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